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I hope this letter finds you in good health and high spirits. It is my distinct pleasure to address you as the Editor-in-Chief of Integrative Omics and Applied Biotechnology (IIOAB) Journal, a multidisciplinary scientific journal that has always placed a profound emphasis on nurturing the involvement of young scientists and championing the significance of an interdisciplinary approach.

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I would like to extend my gratitude to our authors, reviewers, editorial board members, and readers for their unwavering support. Your dedication is what makes IIOAB Journal the thriving scientific community it is today. Together, we will continue to explore the frontiers of knowledge and pioneer new approaches to solving the world's most complex problems.

Thank you for being a part of our journey, and for your commitment to advancing science through the pages of IIOAB Journal.

Yours sincerely,

Vasco Azevedo

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ARTICLE **OPEN ACCESS**

ECONOMIC AND BIOLOGICAL YIELD ASSESSMENT OF WHEAT GENOTYPES UNDER TERMINAL DROUGHT IN PRESENCE OF HUMIC ACID USING STRESS TOLERANCE INDICES

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ABSTRACT

This research was carried out to study the effect of application of a peat based liquid humic fertilizer on economic and biological yield of six bread wheat genotypes under terminal drought stress. Irrigation and humic levels (well irrigated; well irrigated + humic fertilizer; terminal drought and terminal drought + humic fertilizer) had significantly different effects on economic and biological yield, but it was not significant for harvest index. Humic fertilizer decreased drought stress intensity by 20%. There were significant differences among genotypes in terms of economic yield and harvest index. Tolerance indices including SSI, TOL and STI were estimated. Some correlations were observed between indices when humic fertilizer was applied compared to without humic fertilizer condition. Gascogne, Sabalan and 4057 genotypes had the highest harvest index and economic yield. Correlation between economic and biological yield was positively significant for all four irrigation and humic levels. Humic fertilizer led to significantly negative correlation between harvest index and biological yield. This did not create similar effect in drought condition. Genotype 4057 had the highest economic yield in both stressed and non-stressed condition irrespective of whether humic fertilizer was applied or not. Gascogne was placed after 4057 as a tolerant genotype when humic fertilizer was applied.

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INTRODUCTION

World demand for wheat, as a stable food crop, is increasing. So, it is an immediate need to develop new genotypes which could tolerate serious terminal drought stress in semi-arid regions, without considerable reduction in kernel yield. Selecting wheat genotypes based on their yield performance under drought conditions is a common approach to achieve this aim. For identifying tolerant genotypes to water deficit condition, some drought stress indices or selection criteria have been suggested by different researchers [1]. As the most important abiotic stress, drought is a major restriction to wheat and other agricultural crops production in arid and semi-arid regions[2]. Drought stress induces several physiological, biochemical and molecular responses in crop plants which help them to adapt to such limiting environmental conditions [3]. The susceptibility of plants to drought stress varies depending on the stress degree, different accompanying stress factors, plant species and their developmental stages [4].

Most genetic gains in wheat yield potential were mainly achieved by means of improvements in harvest index with marginal or no modification of biomass, though recently some researchers reported slight increases in biomass in spring and winter wheat [5].Although trends in harvest index with the year of release of cultivars were slightly positive before the introgression of semi-dwarf genes, the incorporation of genes derived from Norin 10 (Rht1 and Rht2) into wheat-breeding programs has been decisive to increase harvest indices [5].

Rosielle and Hamblin [6] defined stress tolerance (TOL) as the differences in yield between the stressed (Ys) and non-stressed (Yp) environments and mean productivity (MP) as the average yield of Ys and Yp. Fischer and Maurer [7] proposed a stress susceptibility index (SSI) of the cultivar. Fernandez [8]defined a new advanced index (STI= stress tolerance index) which can be used to identify genotypes that produce high yield under both stressed and non-stressed conditions and claimed that selection based on STI and GMP would result in genotypes

with higher stress tolerance and good yield potential. The geometric mean (GM) is often used by breeders interested in relative performance since drought stress can vary in severity in field environment over years [9].

In addition to food security, environmental protection has become an important concern worldwide in recent years. With growing population, it becomes more important to manage the use of chemical fertilizers and nutrient elements [10]. Organic matters have been recognized as one of the basis in nutritional plant and soil fertility due to constructive effects on soil physical and biological properties. Organic fertilizers are a major contributor to availability of organic matter in rhizosphere[11]. Humic acid makes up a stable form of carbon that improves certain soil properties such as water holding capacity, pH, buffer and insoluble thermal conductivity [12,13]. Researchers believe that humic substances can be helpful for living organisms at developing stages (as background material or nutrient source, or with an enzyme-like activity); as carriers of nutrients and catalyzes in biochemical reactions and antioxidant activities [14]. In research conducted by Bakri *et al*[15]humic acid as foliar application significantly increased morphological traits such as biological yield in wheat. Seyedbagheri[16]has shown that the application effect of humic substances on plant could be different depending on source and amount used, soil type and cropping system.

The present study was carried out in order to introduce the drought tolerant bread wheat and also to assess the performance of different genotypes under application of a liquid humic fertilizer against terminal drought in Ardabil region, Iran.

MATERIALS AND METHODS

In order to determine the effect of a liquid humic fertilizer (HF) on economic and biological yield as well as harvest index of wheat genotypes under terminal drought conditions, an experiment was conducted at Agricultural Research Farm of Islamic Azad University, Ardabil branch, Iran. Applied liquid humic fertilizer was extracted from peat. Applied liquid peat-based humic fertilizer had 3.3 % humic acid and 0.9 % fulvic acid. Totally, its humic extracts were 4.2 %.

In this study six winter bread wheat genotypes (Gascogne, Sabalan, 4057, Ruzi- 84, Gobustan and Saratovskaya-29) were planted under four different conditions including well irrigated, terminal drought, well irrigated with HF and terminal drought with HF in a split plot design based on randomized completely block design (with three replications). Amount of planted seed was on the basis of 450 seeds per m² and 1000 seed weight of genotypes. The main plot size was 3 × 7m and the sub plot size was 0.6 × 3m. Wheat genotypes were distributed randomly in sub plots.

Applications of HF were done at four stages: 1) preplanting on seeds 2) tillering 3) stem elongation 4) after anthesis. Preplanting treatment of seeds was on the basis of 220 ml HF plus 10 litres of water for 1 ton seeds. For this, 1000 grain weight of wheat genotypes was measured and the amount of HF was calculated and used for pretreatment of seeds per plot. Spraying treatments on foliage was on the basis of 400 ml of HF plus 50 liters of water per hectare. Five times irrigation were given to the well irrigated treatments, and two times no irrigation were given to the drought treatments after anthesis. All the cultural practices were uniformly applied to all the experimental units.

After physiological ripening, all the wheat plants were harvested and weighed as a biological yield for each plot. Before harvesting, plot margins were removed. Economic and biological yield in a unit area (1.44 m²) basis were estimated. Harvest index was calculated as seed weight divided by un-thrashed plant weight × 100. Drought tolerance indices were calculated according the following equations:

$$STI = (Y_{pi} \times Y_{si})/Y_p^2$$
$$TOL = (Y_{pi} - Y_{si})$$
$$SSI = (1- (Y_{si}/Y_{pi})) / SI \; ; \; SI = 1- (Y_s/Y_p)$$

Where Y_{si} and Y_{pi} are stress and optimal (potential) yield of a given genotype, respectively. Y_s and Y_p are average yield of all genotypes under stress and optimal conditions, respectively.

RESULTS

Mean Comparisons of economic yield and biological yield for different experimental levels of this research is presented in the Figures 1-4.
There are correlation coefficients between economic yield, biological yield and harvest index in Table 1.
Average yields of wheat genotypes under different conditions of this study with humic fertilizer or control (without humic fertilizer), and tolerance indices is presented on the Table 2.
Table3 show correlation between different selection indices and average yield of wheat genotypes under water stress treatments with humiclevels.
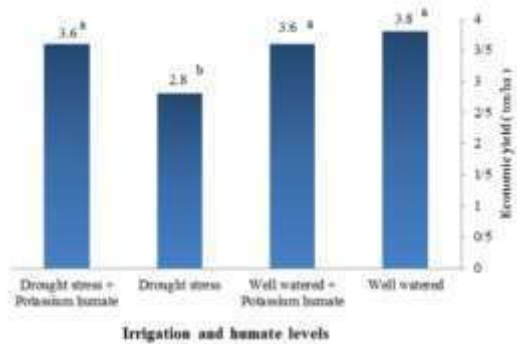
Fig: 1. Mean comparisons of economic yield for different irrigation and humic levels
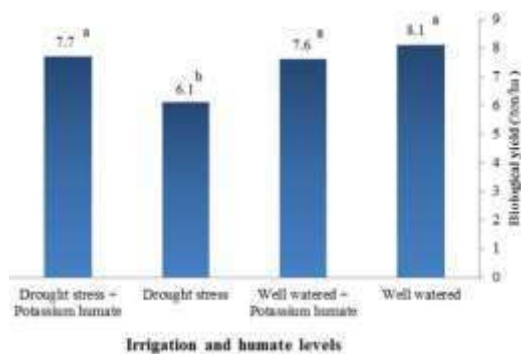

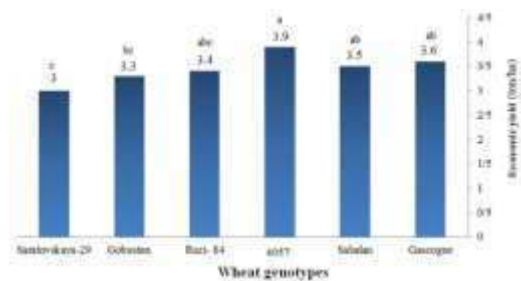**Fig: 2. Mean comparisons of biological yield for different irrigation and humic levels**

Fig:3. Mean comparisons of economic yield for wheat genotypes
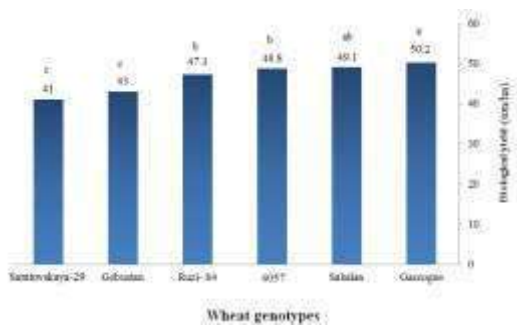

Fig: 4. Mean comparisons of biological yield for wheat genotypes

Table 1.Correlation coefficient between economic yield, biological yield and harvest index

Levels	Well irrigated		Well irrigated +humic fertilizer		Drought stress		Drought stress +humic fertilizer	
Characters	Biological yield	Harvest index	Biological yield	Harvest index	Biological yield	Harvest index	Biological yield	Harvest index
Economic yield	0.850**	0.601**	0.760**	0.155	0.931**	0.422	0.875**	0.647**
Biological yield		0.119		-0.515*		0.073		0.205

Table 2.Average yields of wheat genotypes under optimal (Yp) and stressed (Ys) conditions with and without humic fertilizer, and tolerance indices

Genotypes	Ypi		Ysi		STI		TOL		SSI	
	HF	-	HF	-	HF	-	HF	-	HF	-
Gascogne	3.9	3.7	2.5	4.3	0.66	1.20	1.41	0.00	1.4	0.00
Sabalan	3.8	3.3	3.2	3.8	0.83	0.96	0.64	0.00	0.65	0.00
4057	4.4	4.0	3.4	4.0	1.02	1.19	0.98	0.00	0.87	0.00
Ruzi- 84	4.0	3.8	2.9	3.1	0.79	0.90	1.13	0.71	1.09	7.45
Gobustan	3.7	3.4	2.8	3.3	0.71	0.84	0.97	0.10	1.00	1.25
Saratovskaya-29	3.1	3.7	2.3	2.9	0.48	0.78	0.82	0.80	1.02	8.88

HF: humic fertilizer

Table 3.Correlation between selection indices and average yield of wheat genotypes under well- irrigated and stressed condition, with and without humic fertilizer

	Ypi		Ysi		STI		TOL		SSI	
	HF	-	HF	-	HF	-	HF	-	HF	-
Ysi	0.81	0.14								
STI	0.94**	0.51	0.97**	0.93**						
TOL	0.31	0.29	-0.31	-0.90*	-0.07	-0.67				
SSI	-0.80	0.30	-0.66	-0.90*	-0.45	-0.67	0.92**	0.99**		

HF: humic fertilizer

DISCUSSION

The lowest amounts of economic and biological yield belonged to the drought stress condition (Figure 1 and 2). Terminal drought stress decreased economic and biological yield by 32% and 28% respectively, relative to mean of irrigation and humic levels. Demirevska*et al*[4]reported that stress degree, plant species and their developmental stages had effect on susceptibility of plants to drought. By application of humic fertilizer in drought stress condition, the economic and biological yield became like well irrigated plants. These results are in conformity with Kulikuva*et al*[14]that expressed the mitigating effect of humic substances on living organisms. In a research conducted by Bakry*et al*[15]foliar application of humic acid significantly increased morphological traits such as biological yield in wheat. Humic fertilizer increased economic and biological yield by 0.8 ton/ha (28.6%) and 1.6 ton/ha (26.2%) respectively. Seyedbagheri[16] evaluated commercial humic acid products derived from lignite and leonardite in different cropping systems from 1990 to 2008. The results of their

evaluations differed as a result of the source, concentration, processing and quality of humic substances as well as type of soil and cropping systems. In their research, crop yield increased from a minimum 9.4 to a maximum 35.8%.

Mean comparisons (Figure 1) showed that HF increased biological yield from 6.1 to 7.7 ton/ha, also economic yield from 2.8 to 3.6 ton/ha in drought condition. This increase was not significant for well irrigated condition. This finding corroborates the finding of Shahryari and Shamsi[17]. They studied effect of humic fertilizer derived from sapropel and reported that it increased the rate of biomass production but had no effect on harvest index. Humic acid makes up a stable form of carbon that improves certain soil properties such as water holding capacity [12,13]. In addition, the role of humic acid is well known in decreasing intensity of water stress [18]. These beneficial roles of humic acid can be used in crops such as wheat to improve economical and biological yields under both well-irrigated and water deficiency condition.

It was revealed from the data that biological yield values varied from 41.0 to 50.2 ton/ha among different genotypes and economic yield from 3.0 to 3.9 ton/ha (Figure 3 and 4). Gascogne, Sabalan and 4057 had the highest harvest indices and economic yield among the genotypes. Based on harvest index they ranked as Gascogne, Sabalan and 4057; and based on the economic yield they ranked 4057, Gascogne and Sabalan.

Correlation analysis provides information on interrelationship of important plant characters and therefore, leads to a directional model for direct and/or indirect improvement in grain yield. Although direct selection for various parameters could be misleading, indirect selection via related parameters with high heritability might be more effective than direct selection. All possible correlations were worked out in order to determine the relationship of harvest index with economic yield and biological yield separately in four experimental conditions (Table 1). Correlation between economic and biological yield was positively significant for all four irrigation and humic levels. Thus, there was a linear relationship among these traits. There was significant linear relationship between economic yield and harvest index for well-irrigated and drought stressed+humic fertilizer levels while no correlation was observed among them in the other two conditions. Correlation of biological yield and harvest index was negatively significant for well irrigated+humic fertilizer condition. But relationship between these characteristics was not a linear correlation. Applied humic fertilizer had no effect on harvest index of wheat genotypes. But decreasing of drought stress intensity by 20% was a significant effect of humic fertilizer. It also improved economic yield in terminal drought condition.

Without HF application, genotype 4057 had the highest grain yield in stressed and non- stressed environment (Table 2). This genotype had the highest MP, GMP and STI. It also had the lowest susceptibility to drought stress. Shahriari et al[19] concluded that humic fertilizer resulted in higher tolerance of 4057 against drought (-7 bar PEG 6000) in early growth stages. In HF application condition, Gascogne produced the highest yield after 4057 (Table 2). Numerical values of indices for Gascogne were similar to 4057. However, its grain yield increased from 3.73 ton/ha (YPi) to 4.28 ton/ha (Ysi) which was a remarkably better gain compared to 4057. At last, HF reduced average grain yield differences between stressed and non-stressed conditions from 1.0 to 0.1 ton/ha in this experiment.

There was positively significant correlation (at probe< 0.01) for STI and stress yield (Ysi) at presence of HF or without HF (Table 3). Application of HF had the same effect on relationship between STI and potential yield (Ypi) at presence of HF. These findings were in conformity with Rosielle and Hamblin [6] and Jafari et al[10]. It seems that application of HF led to some of changes in correlation between stress indices.

CONCLUSION

As conclusion, genotype 4057 was also selected as tolerant to terminal drought of Ardabil region, with or without HF application. It appeared that application of this natural bio-fertilizer could be promising in production of wheat and reduction of chemical fertilizer application in terminal drought conditions Ardabil region.

None

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DBIST: DYNAMIC BUILT-IN SELF-TEST, DESIGN AND ANALYSIS

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ABSTRACT

Built in self-test (BIST) is widely used in multiprocessor chips due to its high speed property compared to external testing. In addition, it is known that dynamic logic could award high speed to digital systems. However, high energy consumption has been always a limitation in this logic style. In this paper therefore, we are going to propose a dynamic BIST for network on chips and address its clocking energy dissipation. An analytical model is used in order to find the critical paths in the system. Then based on the analytical analysis, a low energy high speed dynamic boundary scan cell is proposed and simulated using HSPICE and a Matlab special purpose simulator. Results reveal significant improvements in terms of performance and energy consumption.

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INTRODUCTION

Testing complex systems such as on-chip networks containing several nodes is a challenging task in terms of energy consumption and test time. Boundary scan test methodology was initially introduced to facilitate the testing of complex PC boards. The IEEE 1149.1 Boundary Scan Test Standard known as JTAG has been widely accepted in the test community [1]. The standard, nevertheless, provides excellent testing features with less complexity for testing of core logic and the interconnections between them. There has been several attempts to apply this approach for multicore systems [2-6]. However, there is still room for more research in this area to carefully examine and optimize its energy and performance. There are several related works in the literature, which the most important reports are briefly reviewed here. In [7], two methodologies are presented to test interconnections network and their test time are evaluated analytically. They proposed aunicast and a multicast testing approaches for 4x4 Mesh and 4-level BFT. They used a model which covers FIFO buffers and switching blocks delay. Three scan chain architectures for core-based ICs, which aim at a minimum test vector set size are presented in [8]. They analyzed their approaches analytically based on the number of pins available to accommodate scan test, as well as the number of scan test patterns and scannable flip flops of each core. In[9], a novel methodology for testing interconnection network architectures is presented and then, foreach switch, the test time is calculated, which is considered to be the sum of the transport latency and the effectivetest time of the switch. Regular and irregular mesh topologies have been taken into account in the test time modelling. The authors of [10] proposed a BIST-based boundary scan architecture to at-speedtest of cross talk faultsfor inter-switch communication links in network on chip.At the end of the paper the number of clocks is calculated using a mathematical simple model same as the approach used in [11].Chakrabarty in [12] presented two lower bound formulations for system on chip testing time models when dedicated bus-based TAM is used. Later in [13] the model was improved and longer test time was resulted compared to the previous versions. Recently, the effect of network topology has been studied on energy and test time of the network on chips using external tester and built in self-test [14]. For that purpose four analytical models were proposed and the chip was simulated analytically. These models were extension of the approaches presented previously in [15, 16]. The same authors presented an approach to reduce test time using a new test algorithm called horizontal vertical test algorithm [17].

As can be seen there are approaches to reduce the energy and delay of the testing in architectural level. However, there is still no attempt to improve the properties of testing in circuit level. Therefore, in this paper, we apply an analytical model to identify the critical path in testing and then using a circuit level approach the critical path will be improved. Our approach could be used together with any other mentioned methods in order to enhance built-in self-testing.

MATERIALS AND METHODS

BIST architecture for multi-core chips

The architecture is shown in **Figure-1** , TPG is test pattern generator and is used to generate test patterns internally in parallel with the other nodes. This block diagram is repeated in other nodes. Test data out (TDO) in each node is connected to test data in (TDI) of the next node to build a serial connection among data registers (DR) of all nodes. In the rest of this paper all the data registers and their connections is called DR. This DR consists the boundary scan cells. Test result register (TRR) is a new architecture to collect the test results and will be explained later in detail. It is located between the DR TDO of the last node and is connected serially. It collects the data in parallel and sends out the results in serial fashion. The EX/INT signal can switch between TPG and TDI. During the test, TPG is activated by enabling INT signal and the test patterns are generated internally. However, initially, the test is governed and started by external controller using TDI. In this case, TPG is deactivated and EX signal enabled.

Fig: 1. JTAG architecture used for modeling in this paper

ANALYTICAL MODEL TO ANALYZE THE BIST

In order to examine and optimize the BIST approach in NoCs, we need to calculate both energy and test time in critical paths of the BIST. There are several models proposed in the literature [10, 11, 14-16,18]. Among those, the most suitable models are [16] and [14] for energy and a test time in our application. For completeness, a summary those approaches is given in continue.

Energy Consumption

According to test procedure, testing energy could be divided and written as [16]

$$E_{BIST} = E_{TAP} + E_{IR} + E_{TPG} + E_{DR} + E_{Link} + E_{TRR} \qquad (1)$$

, where E_{IR} and E_{TAP} are the energy of instruction register and TAP controller, E_{TPG} is the test pattern generator energy, E_{DR} is the data register energy and E_{Link} is the link energy. The instruction register energy is expressed as

$$E_{IR} = 2n^2 L_{IR}^2 E_{IR_{CELL}} \qquad (2)$$

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where *n* is the dimension of *n×n* mesh NoC, E_{IRCELL} shown in **Figure-2**, is the energy of a single cell of IR, and L_{IR} is the length of IR in cell.
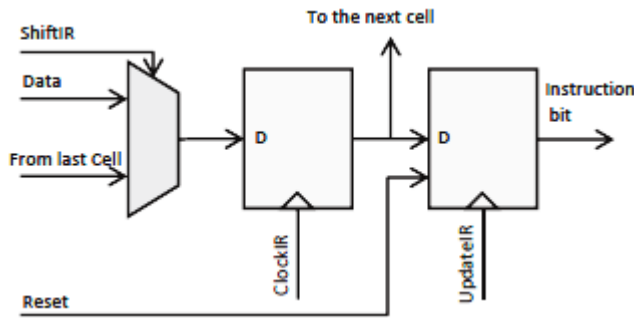

Fig: 2. Instruction register (IR) cell standard implementation [14]

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As shown in **Figure- 3**, data register energy is the energy dissipated at input and output boundary scan cells (BSCs) **[igure 3(a) and 3(b) respectively]**). Its energy during a complete test procedure is written as

$$E_{DR} = (L_{DR_{avg}}E_{DRshift} + n_{in}E_{DRupdate} + n_{out}E_{DRcapture})n^2 n_{tp} \qquad (3)$$

where, **E DR shift** is the energy of shifting test data into a BSC, **E DR update** is the energy of sending test data from BSC to a link, and **E DR capture** is the energy of loading data from link to a BSC.
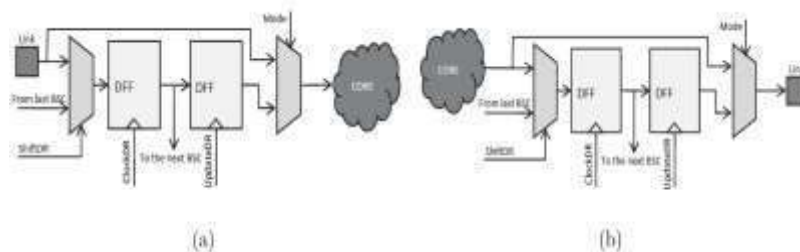

Fig: 3. Input (a) and output (b) boundary scan cells schematic according to IEEE 1149.1 implementation [14].

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In addition, **L_{DRavg}** shown in **Figure-4,** is the average length of DR in unit cell and the Shift, update, and capture energies can be written as

$$E_{DR_i} = E_{MUX}(2) + E_{DFF} \qquad (4)$$

, where *i*=DR shift, DR capture, and DR update.
In addition, applying standard IEEE standard TAP [1], a TAP controller could be implemented using 80 two-input NAND gates and 8 DFFs. As a result, the total energy of TAP controller is written as

$$E_{TAP} = n_{tp}n^2(n_{states}E_{DFF} + n_{NAND}E_{NAND}) \qquad (5)$$

where n_{states} is the number of transitions in DFF during testing of each test pattern, and n_{NAND} is the number of NAND gates used in each TP. Finally, the link energy being the total energy dissipated at input and output links between cores is expressed as
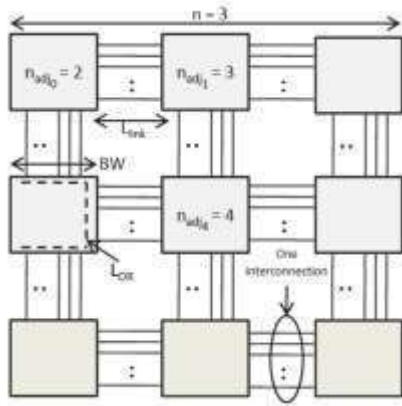
$$E_{Link} = f\alpha_{link}V^2 C_{link}L_{DRavg}n^2 n_{tp} \qquad (6)$$

_____

where V is the supply voltage and C_{link} is the corresponding link energy.

Test time (test delay)

According to [14], the total number of clocks is given as

$$T_{BIST} = \left(12 + 8n^2 L_{IR} + 4n_{tp}L_{DRavg}\right)T_{clk} \tag{7}$$

Fig: 4. Number of adjacent nodes and link bandwidth (BW) in NoC with size *n* x *n*, link length *L link*, and mesh structure

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The proposed approach to store and shift the results

Comparator

Comparator circuit shown in **Figure-5 ,** is connected to the data register as illustrated in **Figure-6**. Input containing test pattern and output containing test responses are compared using XOR gates. It is worth to mention that in this project only stuck at fault for links are studied. Therefore, input links are compared with output associated links in the neighbor node. Any difference shows a failure in the link. In terms of energy, whenever the data register is updated, comparator consumes energy. As DR is updated by DR shift and DR capture signals thus the comparator energy is written as

$$E_{CMP} = n_{tp}n^2(E_{CMPshift} + E_{CMPcapture}) \tag{8}$$

where, according to **Figure-5**
$$E_{CMPshift} = L_{DRavg}(L_{DRavg}E_{xor} + E_{or}) \tag{9}$$

and
$$E_{CMPcapture} = n_{int}(E_{xor} + E_{or}) \tag{10}$$

Test Result Register Energy (E_{TRR})

An especial register is devised here to store the result of testing of the links. Shift DR and Capture DR signals are used at MUX's selectors to control shifting and storing data. Two actions are defined on test result register, being storing test results and shifting them out. Each cell of TRR illustrated in **Figure-6**, works as follows. If the data register is updated when the test data are shifted into the DR, then Update DR=1 and the TRRs are reset. In the next step, when Shift DR=0 and Capture DR=1 showing that the test data is captured at the other end of the link. Thus the comparator compares the data at the rising edge and the TRR cell stores the result into the TRRs at the falling edge using the input MUX. It is worth to mention that the inverter on the Clock DR signal separates the actions on rising and falling edges of

the Clock DR. The next action is shifting test results out the NoC. This happens when Shift DR=1 during EXTEST and PRELOAD instructions. The DFFs are serially connected to each other and form a shift register, which is connected to the TDO signal. This shift register is shown in **Figure-6** at the upper right corner. The length of this shift register is equal to the n_{int}. Energy of TRR shown in **Figure-6,** is given as

$$E_{TRR} = E_{TRRShift} + E_{TRRUpdate} \tag{11}$$

where$E_{TRR\ shift}$ is the energy of TRR due to shifting n_{tp} test patterns given as

$$E_{TRRShift} = n_{tp}\, n_{int}^2\, (E_{DFF} + E_{MUX} + E_{inv}) \tag{12}$$

considering that for each interconnection there is only one DFF to store the test result. In addition, the updating energy for n_{tp} times is written as

$$E_{TRRUpdate} = n_{tp}\, n_{int}\, (E_{DFF} + E_{MUX} + E_{inv}) \tag{13}$$
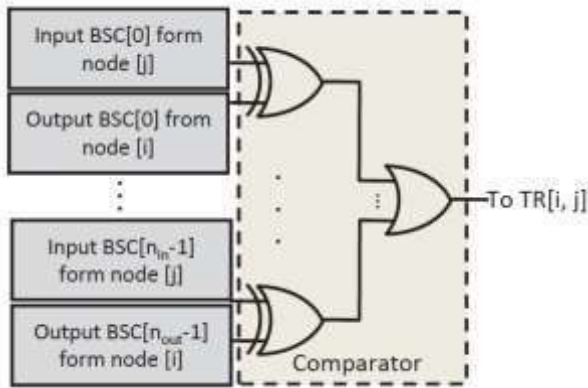
Fig:5. Comparator circuit used in the proposed test architecture

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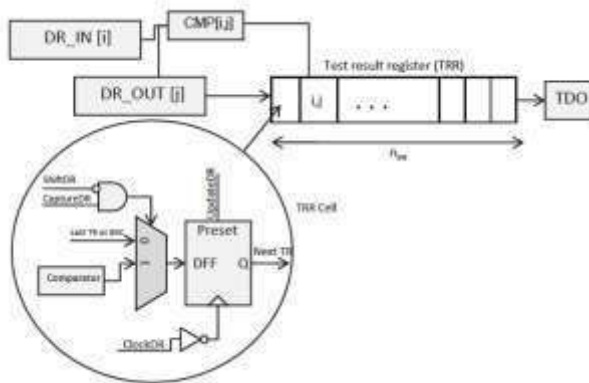
Fig: 6.The proposed mechanism to store and shift out test results is based on the test result register cell shown in this Figure

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Dynamic BIST

Critical path analysis

Based on the definition of clock period (T_{clk}) being the maximum time which is required to finish each state of the TAP controller, it is written as

$$T_{clk} = \max(T_{IR-Capture} + T_{IR-Update} + T_{DR-Capture} + T_{DR-Update,...}) \tag{14}$$

In addition, based the structure of the input and output BSCs shown in **Figure-5(a)** and **5(b)** respectively, the maximum delay is attributed to DR-Update. We verified our opinion using HSPICE simulation of the BSC and a typical link. Therefore, T_{clk} is equal to the delay of the DR-Update which is given as

$$T_{UpdateDR} = T_{FF} + 2T_{MUX(2)} + T_{Link} \tag{15}$$

where propagation delay T_i is written as

$$T_i = Ln(2)R_{on}C_{on} \tag{16}$$

In which i could be FF, two-input multiplexer, Link, and R_{on} and C_{out} are the on-state gate critical path resistance and output capacitance of the circuit respectively. Based on above argument, any possible improvement should be in this architecture. Furthermore, simulation results carried out using the analytical model shown in **Figure-7**, indicate that the BSC or DR is also the bottle neck of the system in terms of energy consumption. Therefore, any approach with high energy consumption overhead will affect the total energy dissipation significantly which is not desired.
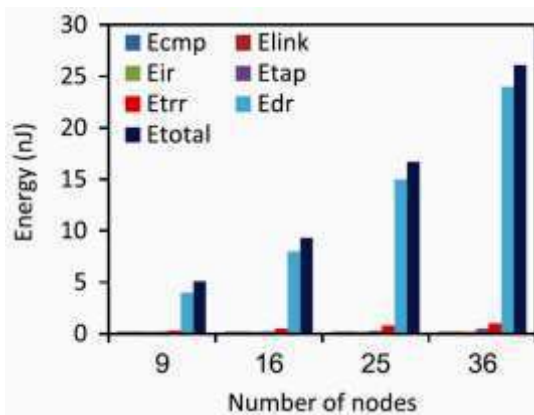
Fig: 7. Result of analysis of several multi core chips in terms of testing energy

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As a result, in the next section we are going to propose a low energy high speed circuit-level approach to improve the BSC structure.

The proposed dynamic boundary scan cell

As mentioned, the clock period is a function of DFF delay applied in DR, IR and TRR. One way to enhance the delay is to use dynamic flip flops. Nevertheless, it requires clocking which is energy dissipating. However, looking at the test architecture illustrated in **Figure-1,** shows that a clock is used in order to shift data in shift registers (DR and TRR). Therefore, by reusing this clock, clocking energy overhead can be avoided. Consequently, a special flip flop is designed to be used in JTAG architecture which is depicted in **Figure-7**. In this circuit, two types of latches are used being rising edge triggered (RET) and falling edge triggered (FET). The RET uses only 4 NMOS and 2 PMOS transistors and the FET is designed with 4 PMOS and 1 NMOS transistors as illustrated in **Figure-8**. Then employing master-slave flip flop structure, a DFF is created. According to standard BSC design illustrated in **Figure-3**, UpdateIR, ClockIR, data in signals are connected to the circuit and BSC is constructed. Comparing the current design and the conventional circuit shown in **Figure-9** using static logics, reveals the following point. Firstly, in our design, the number of transistors has been reduced. Secondly by reusing Update IR and Clock IR as clocking signals for dynamic logic, the clocking energy overhead of dynamic logic is significantly decreased. In addition, since in our design, there is no need to invert the clocking signals (Update DR, Update IR, Clock IR and Clock DR), the number of transistors is reduced from 28 in conventional design to 24, which results in even energy reduction.
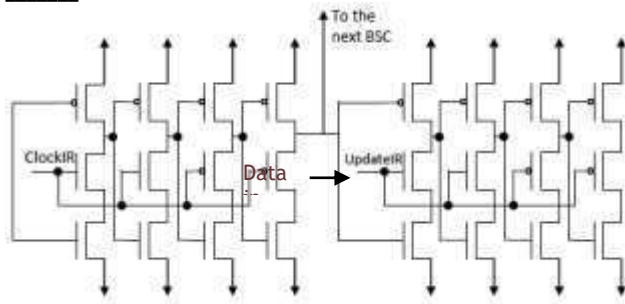
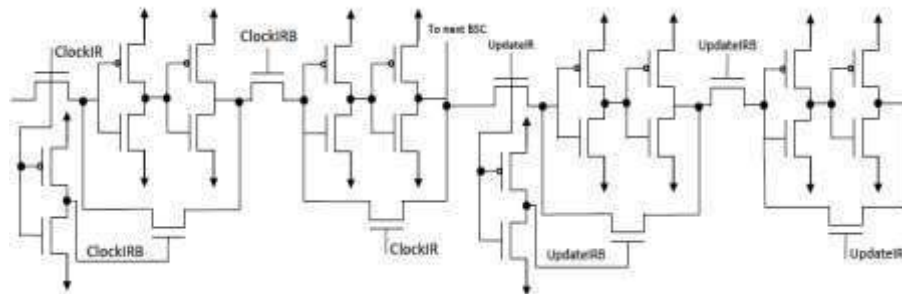**Fig:8.The proposed dynamic design of BSC with 24 transistors**

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Fig: 9. Conventional design of BSC using static CMOS inverters to implement latches. This design uses 28 transistors

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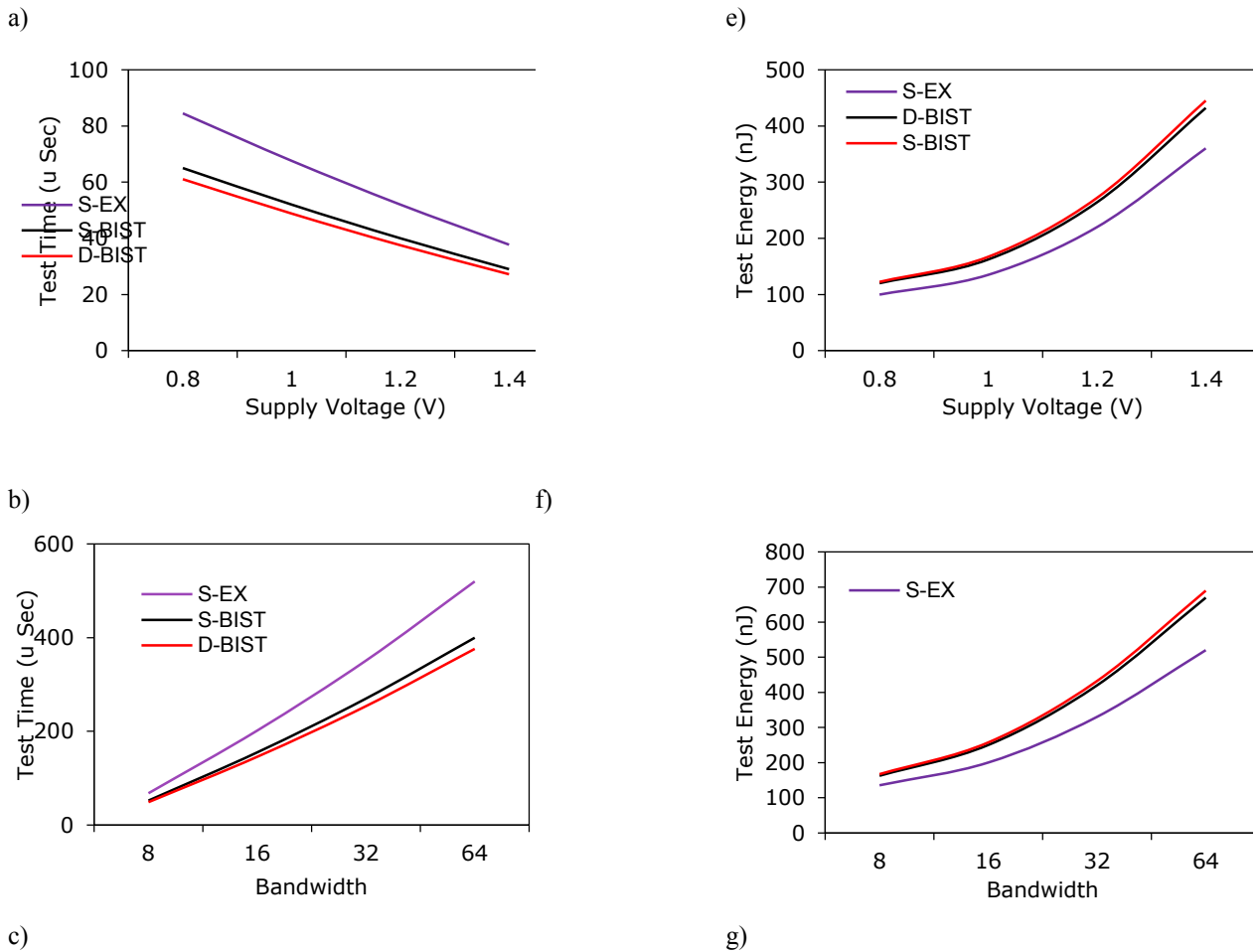
RESULTS

We calculate the energy consumption and test time of the proposed architecture using the presented analytical model. For the basic modules such as flip flops and NAND gates, HSPICE simulation and 32 nm PTM technology model are employed. Table 1, shows the values of HSPICE simulation at 1 V supply voltage, which is the default simulation voltage in this technology. For the output nodes 5 FF output load has been considered which is normal for 32 nm technology. In addition, the energy and delay of the proposed flip flop is compared with those of the conventional static DFF.

Table: 1. Simulation results for the proposed flip flop, the conventional flip flop and other used gates in the test architecture.

| Module	Delay (ns)	EEnergy (fJ)	EDP (fJ.ns)	No. Transistors
Conventional BSC	11.12	0.54	6	28
The proposed BSC	9.34	0.51	4.76	24
2-input OR	3.01	0.102	0.3	6
2input-Nand	2.82	0.093	0.25	4
2-input-Mux	3.12	0.115	0.35	4

It is seen that the proposed FF has 16% less delay, 5% less energy and 26% less EDP compared to the conventional circuit. The circuit is used in test architecture which is called dynamic BIST (D-BIST) in the results. The test time is seen in **Figure-10(a)** to **10(d)** and energy in **Figure10(e)** to **10(h)**. In this Figure, S-EX, S-BIST are static external tester and static BIST respectively. The proposed architecture has been examined at different conditions of supply voltages in **Figure10(a)** and **10(e),** band widths in **Figure10(b)** and **10(f)**, number of test patterns in **Figure-10(c)** and10(g) and number of no des in **Figure10(d)** and **10(h)**. It is seen that external tester shows at least 29% more delay compared to normal

BIST at different conditions and the proposed BIST shows at least 13 % less delay compared to the normal BIST and 43% compared to external tester at different conditions. Looking at energy, it is found that the energy for the proposed approach is around 4% less compared to that of S-BIST. In addition, it is seen that as the bandwidth, number of nodes, and number of test patterns increases the test time and energy increases as well for all the testing approaches. However, increasing the supply voltage results in decrease in test time while it causes the energy to increases. Since the TPG is located outside the nodes in external tester by increasing the number of nodes the S-EX approach's test time increases exponentially while due to using TPG in parallel in BIST, the test time does not increase too much by increasing the number of nodes. **[Fgure-0(d)]** Increasing the number of nodes however, results in more energy consumption of BIST compared to that of the external tester.
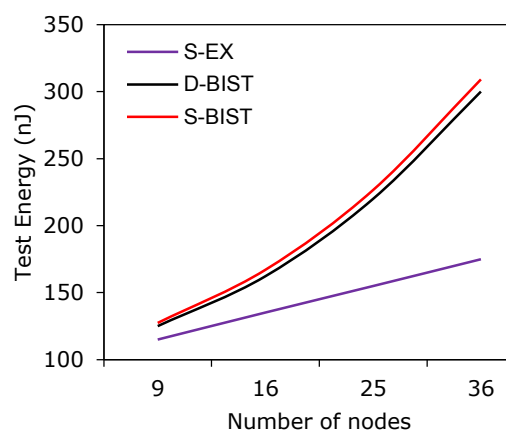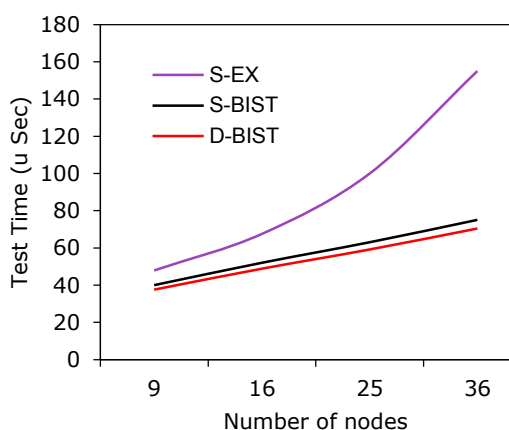
a)

e)

b)

f)

c)

g)
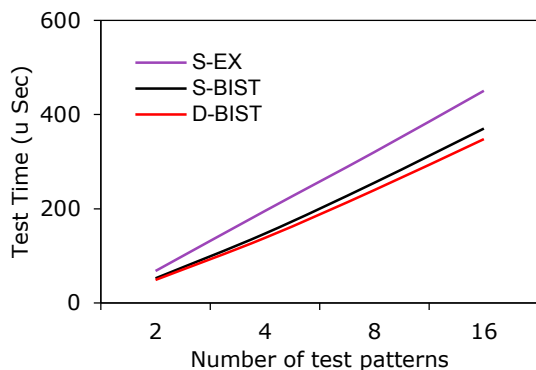
d)
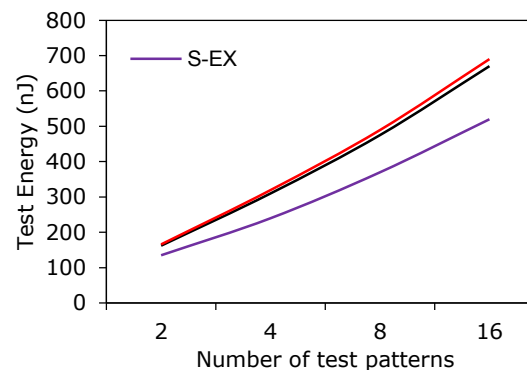
h)

Fig: 10. The result of simulation based on the proposed model for static external tester (S-EX), standard static BIST (S-BIST), and the proposed approach dynamic BIST (D-BIST) at different conditions of supply voltage, bandwidth, number of nodes and number of test patterns. The results show energy consumption and test times of using these approaches on NoCs.

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CONCLUSION

In this paper, first we proposed a new test architecture for storing test results called test result register (TRR) for application of JTAG in on chip network testing. Using an analytical approach we studied and spotted the critical delay of the built-in self-test (BIST), which found to the boundary scan cells. Standard static BSC used in data register, test result register and instruction registers were replaced by the proposed dynamic BSCs and the JTAG built-in signals were used for clocking the dynamic logics in order to avoid energy consumption overhead of the dynamic logics. Results showed that using the proposed approach due to low transistor count and high speed of dynamic logics, the test time applying BIST was reduced 13% and energy decreased 4% compared to conventional JTAG BIST approach. In comparison to standard JTAG external tester our approach is 43% faster.

CONFLICT OF INTEREST
Authors declare no conflict of interest

FINANCIAL DISCLOSURE
None

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ARTICLE　　**OPEN ACCESS**

A PROPOSED SOLUTION TECHNIQUE FOR TELEMETRY OF METHANE USING OF CARBON DIOXIDE LASER WITH COMSOL SIMULATOR

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ABSTRACT

Detecting the presence, concentration and the ratio of gases, as well as the standardization of gas transfer especially methane is important for various reasons such as life threatening risks for people who are exposed to this gas and many ways to measure this gas are proposed and implemented. Among the variety of proposed contact and non-contact sensors (remote), contact sensors for reasons such as delay or short lifelong which is mainly due to the establishment of chemical bonds are restricted in application. However, these problems are solved in non-contact sensors, yet the use of this type of sensor need complex electronic circuits. This article uses carbon monoxide gas laser, provided a new model for measuring methane. Results indicated the success of the model with the accuracy of 5ppm and time less than 1.4 seconds.

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INTRODUCTION

Because on the one hand contact sensors due to chemical bonds such as covalent and dative require time to display changes or return to their initial state and on the other hand, sensors such as optical sensors that are remote sensors (non-contact) have solved the problem because there are no bonds, they are always the same and are very fast in performance, therefore working on this type of sensor that are frequently used in the industry seems very important.
Materials:

1.　Laser:

The laser is common source of light with particular characteristics and applications. Since its invention in the late 60's, it led high technology developments and removal of laser from many technologies today is no longer possible. [1] In general, lasers are divided into four main categories according to their type of active ingredient: laser doped with insulator, semiconductor lasers, gas lasers, color lasers. Gas Lasers are divided into three categories: atomic lasers, ion lasers and molecular lasers. [2]

2.　Carbon dioxide laser:

Lasers that their active ingredient is gas are called gas lasers. Gas lasers are bulky and usually the more powerful they are their size will be larger. Since the atoms in gases have very narrow absorption lines, it is almost impossible to release energy in them with the help of light pump. Considering different kind of lasers and laser material, different methods of pumping are used. For example, in gas lasers such as carbon dioxide lasers, discharge method is used. This laser is of the most important lasers of its kind in terms of its technical application

are classified among the most important lasers. This laser is built with high efficiency (30%) and continues high output power (several kV). The structure of a gas laser is shown in **[Figure- 1].**
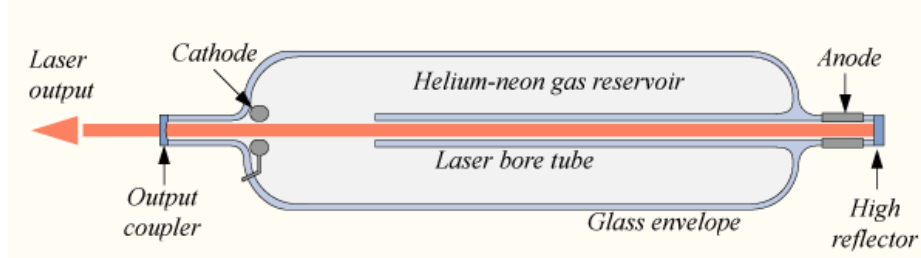

Fig: 1. Structure of a gas laser

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3. Methane

With the molecular formula of CH_4 is a greenhouse gas and is used as fuel. The simplest alkane is methane. It is the main ingredient of natural gas that is formed from the breakdown of plant material in lagoon areas. Because of its ability to absorb large amounts of heat, the gas has greater greenhouse effect than carbon dioxide. In standard conditions of temperature and pressure, the gas is odorless, colorless, subtle and lighter than air and is the first combination of saturated hydrocarbons. The gas is produced from the decomposition and decaying of organic matter in nature, especially corruption of plants in the swamps, so it is called "swamp gas" as well. [3-5]

METHODS

In this study, COMSOL software was used to measure methane and following steps were performed during the simulation.
The first step: First, as **[Figure 2]** a chamber was simulated that on one side of it there was a hole to transmit light and on opposite side there was an optical receiver. Two lenses are located on this structure to parallel the light rays.
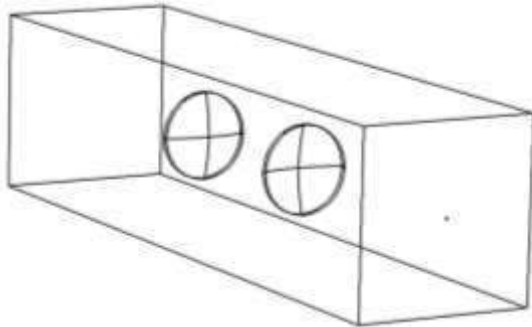

Fig: 2. Simulated structure

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The second step: once the chamber was tested in vacuum and results were registered as a comparison reference. The third step: the chamber were tested once by air, once with methane and once by combination of these two gases. In this test, sending light beams was in the carbon dioxide laser wavelength range, which is between 9.6 and 10.4, micrometers [13], the optical receiver receives it, and measuring the received power was at 3 seconds interval.

RESULTS

[Figure- 3] indicates the intersection differences in gas conditions with the reference one where the blue one is related to vacuum and green is related to the existing gas conditions.
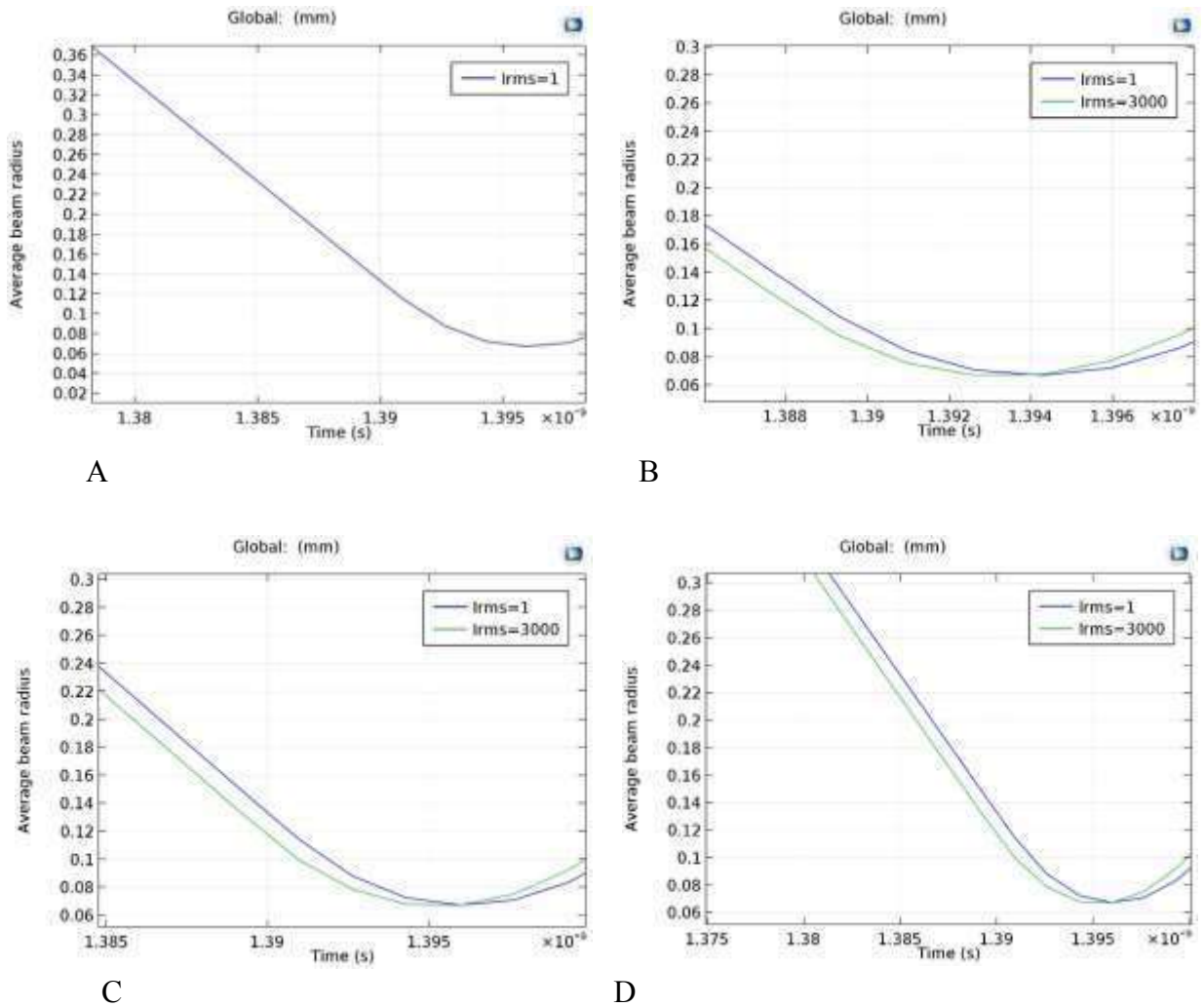
Fig: 3. Results of simulating A) vacuum B) the presence of air C) the presence of methane D) equal mix of air and methane.

The numerical values of these points are given in **Table- 2**.

Table: 2. Achieved outputs

Condition	Air	equal mix of air and methane	Methane
Time (s)	1.39405	1.396.3	1.39604
Value (micrometer)	67.54	67.46	67.41

These differences show that the carbon oxide laser is capable of detecting methane gas and can measure methane concentrations in the environment very well with high accuracy of 5 ppm. In addition, in terms of detection time in all the cases, it was less than 1.4 seconds, which is a good rate compared to previous research.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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ELECTRONICS

ARTICLE   **OPEN ACCESS**

DESIGN AND CONSTRUCTION OF COOLING SYSTEM USING SOLAR FURNACES AND SOLAR PANELS

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ABSTRACT

Considering the need for cooling systems, the geographical location of Iran with very hot cities, and exhaustible fossil fuels, it is necessary to design and manufacture a cooling system that can operate using renewable energies such as solar energy. The designed system is composed of several sectors including electronics and control circuits, photovoltaic system, absorption cooling system, and parabolic solar furnace. What makes this system distinguished from other systems ever made is electronic and control circuits and utilizing 100% of the solar energy. According to the results, the final price of a split air conditioner operating with solar energy which can cool down a room with dimensions of 3×4×2.40 meters in 1 min and 50 s from 35 °C to 21 °C will be 95,880,000 IRRs. If such a system cools down such a room in 3 min, the price will be 36,720,000 IRRs. Therefore, considering the final price, we can neglect the time spent to reach the optimum temperature.

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INTRODUCTION

According to the studies, people efficiency at temperature of 21°C is about 10% more than higher temperatures. This reflects the importance of air conditioning in workplace and living environment [1]. Air conditioning has two elements of cooling and heating. Since in Iran cooling systems are required more than heating systems, the focus of this study is on cooling systems. High consumption of fossil fuels in cooling systems reduces the tendency to use these systems. The objective of this study is to eliminate the use of fossil fuels in cooling systems which is fulfilled. In this regard, the solar energy is used both directly and indirectly. Solar energy is concentrated in the focal chord of parabolic solar furnace and warms up the generator of the absorption cooling system through oil-carrying copper pipes located in the center of the furnace (direct use). This heat warms up the evaporator . The heat generated by the evaporator is transferred to the environment by the fan. The photovoltaic panels will provide energy required by the fan (indirect use) [2, 3].

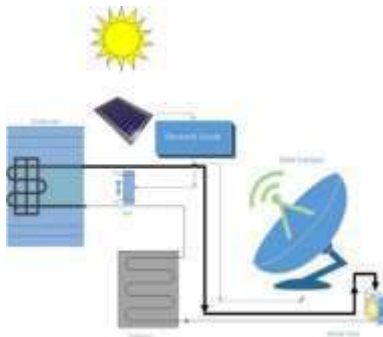**Figure- 1** shows the components required by the system to operate.

Fig: 1. system components

ELECTRONICS

METHODS

Production of Heat Required by Generator

To produce heat, a parabolic solar furnace was used in this study. To this end, the solar water-heater pipe was located at the center of furnace focal chord. The oil-carrying copper pipe passes through the solar water-heater pipe and is twisted around the generator. In this way, the maximum heat transfers from the sun to water-ammonia solution. In fact, sunlight warms up the water inside the heater and the heat is transferred to the generator by oil-carrying copper pipes. The heat transferred to the generator triggers absorption cooling system, and shortly after this, temperature is reduced to the desired level. Here, we need another approach to transfer the cold to the environment.

Temperature Transmission

To transfer the cold to the environment, a 12 V and 4 mA fan is used which can move the cool air to the environment. This fan works at two different speeds that was switched automatically depending on the ambient and the system temperature or, if necessary, it turned off. The fan voltage at different motor speeds was measured 8.8 and 2.9.

Except for fan that transfers colds to the environment, a pump was needed for ease of oil flowing that can transfer the heat generated in copper pipe as much as possible to the generator of the absorption cooling system. The pump turns on and off automatically according to the temperature of the oil in two different speeds. Pump voltage and current were 12V and 4 amps, respectively.

Electronic Circuits

The key elements of the designed system are electronic and control circuits because the first step to launch the system is to cool down the generator of cooling system to the desired temperature. This is done by temperature control and timer circuits and triggering the oil pump. A schematic view of the system is shown in **Figure- 3**.
The operating frequency of IC NE555, and off and on times are calculated using Eqs. 1, 2, and 3, respectively [9].

$$f = \frac{1}{\ln(2).C.(R_1 + 2(R_2 + R_{NTC}))} \qquad (1)$$

$$Low = \ln(2).C.(R_1 + 2(R_2 + R_{NTC})) \qquad (2)$$

$$High = \ln(2).C.(R_2 + R_{NTC}) \qquad (3)$$
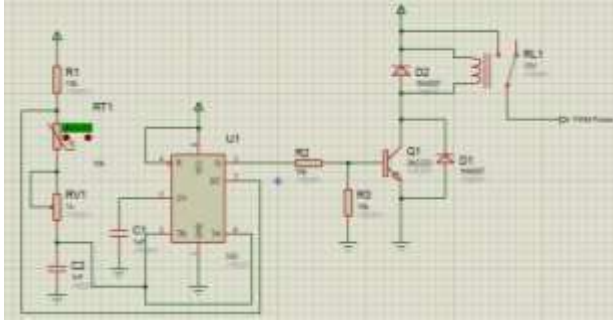
Fig: 3(A schematic view of timer circuit

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The air leaving the fan is the air cooled by evaporator. Therefore, fan motor speed needs to be controlled according to the ambient and evaporator temperature. The PWM circuit used in this study that did this work accurately is shown in **[Figure- 4]**.
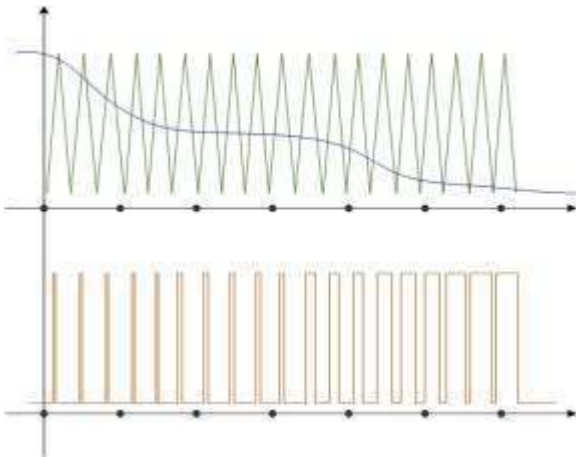
Graph 1. Circuit performance

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RESULTS

The performance of the circuit shown in Graph 1 includes 4 op-amps [10]. In the first op amp, a reference DC voltage was generated for comparison. Using the two other op-amps (i.e. square wave generator and integrator), a triangular wave was generated. In the end, the last op amp was used for comparison purposes to generate a PWM wave.
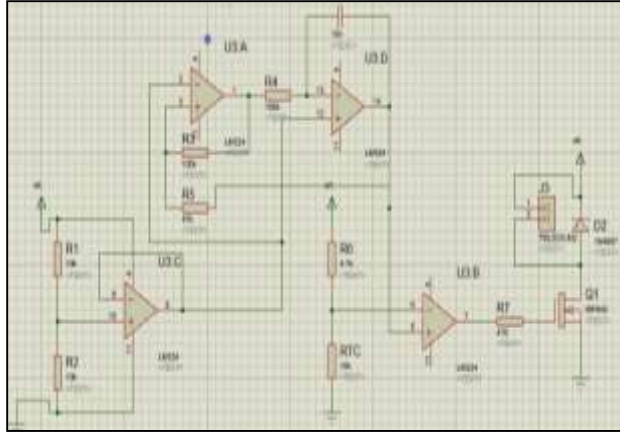
Fig: 4. A schematic view of PWM circuit

....

To trigger the circuits discussed in this section, a power supply is required. For this, a power circuit was used.

Photovoltaic Panels

Photovoltaic systems convert sunlight energy directly into direct current (DC) by solar cells [11, 12]. To supplying the power required by electronic circuits and to set up fans and oil pumps, system needs electrical energy. Since this article was seeking to eliminate fossil fuels, part of the energy was supplied through the solar energy produced by a 60-watt photovoltaic panel.

System Outputs

To test the proposed system performance, a 3×4×2.40 m room was used and the system was located on the roof.
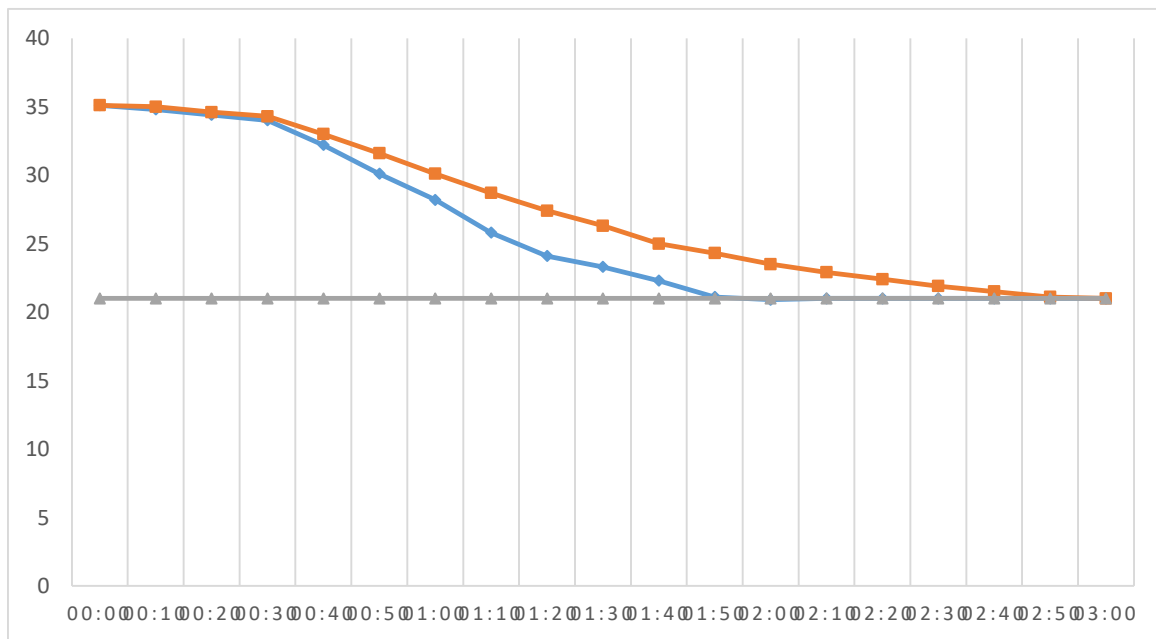
Graph 2. Output of the system compared to the split air conditioned working with solar energy Gray line shows acceptable temp, blue line shows split unit work and orange line shows this system work

The designed system was compared with a split air conditioner from two points of view: cooling efficiency, and economy. Results obtained from comparison of the two systems are plotted in Graph 2 to facilitate the comparison.

CONCLUSION

Without application of electronic and control circuits, we would fail to fulfill the defined objectives. The simplicity of the proposed system in implementation, compared to other systems, is the key factor contributing in mass production. In terms of the cost, it can be argued that final price of this system is one thirds of other systems. In other words, paying a certain price, we can take advantage of the proposed system three times higher than other systems.

According to the results, the final price of a split air conditioner operating with solar energy which can cool down a room with dimensions of 3×4×2.40 meters in 1 min and 50 s from 35 °C to 21 °C will be 95,880,000 IRRs. If such a system cools down such a room in 3 min, the price will be 36,720,000 IRRs. Therefore, considering the final price, we can neglect the time spent to reach the optimum temperature.

CONFLICT OF INTEREST
Authors declare no conflict of interest

ACKNOWLEDGEMENTS
None

FINANCIAL DISCLOSURE
None

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DESIGNING AND MANUFACTURING OF PSEUDO-SINUSOIDAL PWM INVERTER BY USING SMART FEEDBACK TO STABILIZE VOLTAGE PARAMETERS FOR TYPICAL APPLICATIONS

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ABSTRACT

Developing an inverter with high efficiency and with the ability of starting with inductive, capacitive, and resistive loads along with output voltage stability is a challenging problem. Considering higher reliability and convenient maintenance, this paper focuses on the use of analog circuits. In this regard, this paper uses pulse width modulation techniques, intelligent feedback, and peak as well as effective voltage supply are employed. Results indicated that this designed inverter with a power of 700 W can be started with ohmic loads (100% quality), inductive loads (97% quality), and capacitive loads (83% quality).

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INTRODUCTION

Worldwide ever-increasing energy demand from one side and inefficiency of the conventional power generation systems from the other side have led the involved authorities to use reliable and efficient technologies in power production without the use of fossil fuels. In recent decades, with the advancement of power production and energy consumption efficiency, high quality energies such as alternative electricity replaces low quality counterparts such as coal. Electricity as one of the main entities in economic part is greatly important. Thus, consumption forecast and immediate supply of power demand can accelerate economic growth [1]. Excessive growth of energy consumption in Iran is high such that prior to the time horizon 2020, its role as an energy exporter will change to a country of energy importer. To counter this threat, implementing optimization strategies in generation, distribution and consumption of energy, along with modifying consumption patterns and the use of renewable energy are essential [2]. Therefore, the use of converters with high efficiency and power can be greatly useful in solving this problem [3]. P. Sponic et al. and YazdanPanah et al. studied in the field of designing and manufacturing a high frequency inverter controlled by PWM with soft switching characteristics for use in induction heating systems. Soft switching range for the proposed half-bridge inverter is significantly increased compared to conventional half-bridge inverter. Among the applications of the circuit are cook stoves that operate with high thermal efficiency and in constant frequencies around 20 kHz [4, 5]. Ridge studied foundations of power MOSFETs. Discrete power MOSFETs are semiconductor processing techniques that operating similar to today's VLSI circuits. The study consists of a wide variety of MOSFET behaviors; however, here only V-I curve of transistor is examined. When MOSFET is used as a switch, its primary function is to control the discharge current by the gate voltage [6].

Mr. Barati et al. conducted a research in an article entitled "reducing the amplitude of voltage harmonics of the three-phase PWM inverter with parallel processing" and concluded that this technique is highly efficient. In this paper, using power transistors as switches, a three-phase inverter is proposed by PWM method. The experimental results obtained from a laboratory-built plan entirely validated the theoretical results [7].

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MATERIALS AND METHODS

1. Voltage supply

Two basic points are exist regarding the start of consumers with ohmic, inductive, and capacitive loads. First, effective voltage for starting these consumers is 220 V. Second, peak voltage required in starting instant in inductive and capacitive loads is 310 V. In most of the square wave inverters, inductive and capacitive loads cannot be started due to focus on stability of peak voltage of 220 V. On the other hand, this issue is resolved appropriately and high quality by the use of pulse width modulation technique and intelligent feedback.

2. Pulse width modulation technique

PWM is a proper method to stabilize peak and effective voltage of the inverter. Based on the equation below, one can verify that by the use of intelligent feedback to convey load variations, peak voltage and effective voltage are fixed on 310 and 220 V.

$$V_{rms} = \int V_{peack} dt$$

[Figure- 1] depicts PWM technique performance in three modes: normal mode, voltage drop (due to consumer connection), and voltage rise (due to disconnection of the consumer).
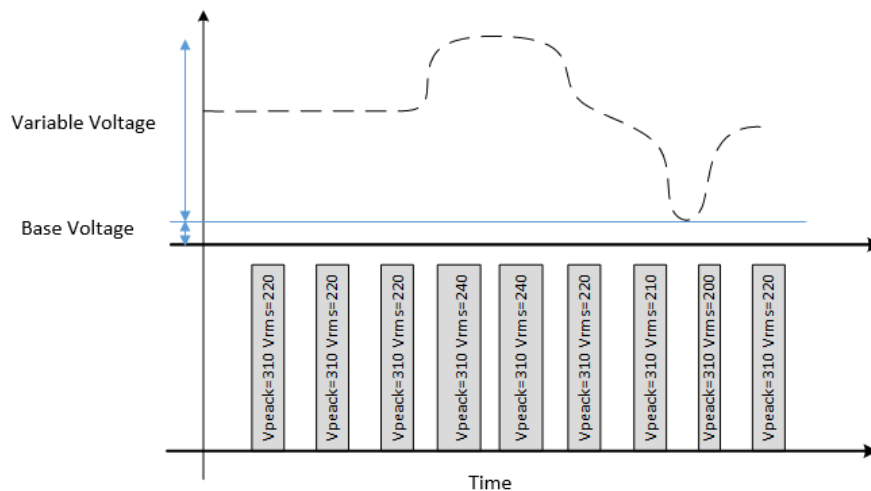
Fig: 1. Performance of PWM technique (dashed line shows load value and square wave shows system output).

……….

3. Intelligent feedback

The output voltage is one of the best examples to adjust employed pulse widths. However, since it is not easily achievable due to higher voltage amplitude and transformation, a 12-V coil with low current mounted on the same transformer is used to get the best and accurate sample. This voltage which is changing with the output voltage and with a similar ratio is the best sampling source. Feedback input, after converting to DC state, is adjusted in two maximum transfer of variations and base voltage value modes by two potentiometer RV1 and RV2 **[Figure- 3].**

4. Analog design

Due to higher reliability and convenient maintenance, this paper focuses on the use of analog circuits. Thus, a powerful IC id SG3526 used within its central part. This IC with higher performance is a pulse width modulator which is designed and fabricated for fixed frequency and other power control applications. Among the performances of this IC, one can mention temperature control, sawtooth oscillator, pulse width modulator, pulse

frequency measurement, having two high current output which is ideal for starting MOSFET transistors, phase difference of 180 degrees and non-overlapping of two outputs and power in high speeds.

RESULTS

Its protection features are soft starting, voltage clamp, current limiter, and adjustable dead time. Adjustability leads this device to connect mid- point transformer. **Figure- 2** shows block diagram of the IC.

Fig: 2. Block diagram of SG3526

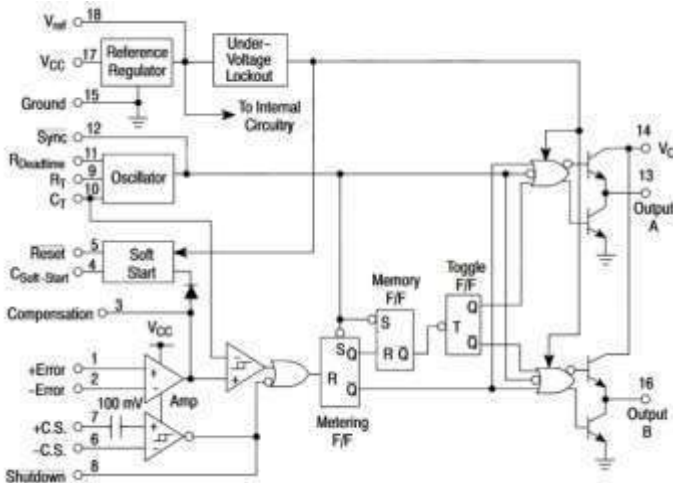..

Designed circuit

In order to maximally utilization of this powerful IC, circuit shown in **[Figure- 2]** is designed.

Fig: 3. Designed circuit

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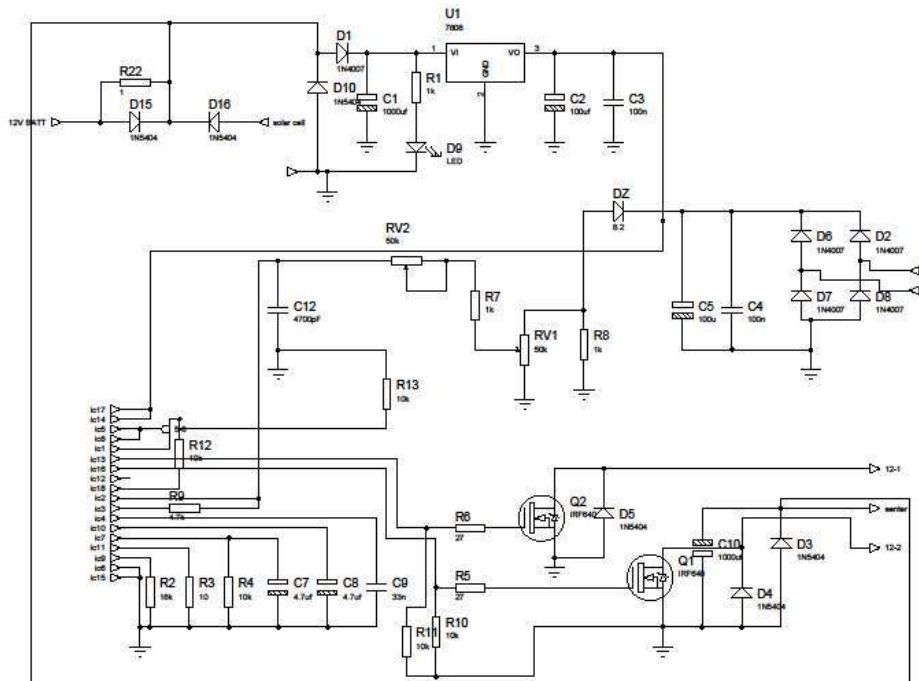
CONCLUSION

Inverters are one of the most important parts of renewable energy systems which can supply required energy demand of customers by DC voltage transform of batteries into AC one. Several aspects such as high efficiency, the ability to start various consumers such as inductive, capacitive, and ohmic loads, and fixing output voltage are important in design and development of inverters. In this paper, the design and development of square-wave inverters are addressed where it was tried to best solve the required parameters.

In order to measure the quality of various loads starters, three incandescent lamps as ohmic loads, drill as an inductive load, and refrigerator as capacitive load are used. Measurement of power produced is done once by a load with nominal voltage and by the designed inverter.
Results showed that the designed inverter with a power of 700 W can start ohmic loads (100% quality), inductive loads (97% quality), and capacitive loads (83% quality).

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ELECTRONICS

ARTICLE   OPEN ACCESS

DISTRIBUTION LOSS REDUCTION USING NEURAL NETWORK ALGORITHM

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ABSTRACT

Obviously, it is very important to examine power loss. There exist various techniques for this purpose. In this paper, artificial neural networks are considered as the best and most appropriate ways to improve network topology. The aim of this paper is to control power switches and decrease sudden changes of the network as well as reduce damages due to power interruption. Results have shown that the use of perceptron neural network algorithm in order to control power networks' topology can improve drops due to power shortage by 91%. Thus, it seems that this new algorithm can resolve some of the problems. In addition, implementation of this algorithm is cost-effective for utilities because there are no fundamental changes in the network configuration.

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INTRODUCTION

Power networks comprises of three parts: generation, transmission and distribution. The generated power is finally delivered to the consumers. For some reasons, this energy has some power losses through its route to the consumers. Research has shown that approximately 13% of generated power is lost in the route between power plants and consumers. The studies on power loss have long been addressed and this issue is a very old discussion. However, what make this issue be on top research topics is costs incurred due to this issue [1].

It is evident that power loss due to energy transmission is unavoidable [2]. However, attempts to obtain a reliable network with the least consumer service interruption and development of devices in transmission and sub-transmission networks as a continuous task in power industry may reduce power losses. Transmission power loss results in million dollars of countries capital. Thus, the issue of "who should pay this financial loss?" is popularized and fair sharing of operational costs among all utilities and participants of the market has been a key issue. Power loss issue is of great importance, particularly, in distribution section. In general, distribution systems have the highest share of power losses in power networks because of their vastness and high number of devices in these systems along with other features such as single phase loads and lower voltage level [8]. Different methods exist to reduce power loss in distribution systems, including:

1) Compensation for power loss reduction due to reactive power;
2) Distribution systems' automation;
3) System voltage optimization and current balance of each phases;
4) Low power loss transformers;
5) Distributed generations' storage;
6) Automatic reading and billing

Unfortunately, power loss is defined as a non-linear function of line current and accurate determination of the power losses due to each elements of the system such as generator, load, and transmission line is impossible. A number of power loss assignment plans have been addressed in which system power losses are assigned to generators and loads in a shared electricity market or

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individual trades in bilateral markets. However, each of which are both theoretical and inefficient or need fundamental changes in the network [3-6].

MATERIALS AND METHODS

First, power network is simulated by artificial neural network and, then, it is implemented using MATLAB and the outputs of interest are derived.

Perceptron network is selected and evaluated since linear combination is required in this paper and appropriate selection of the number of layers and neural cells are the requirements of this work.

Artificial neural network comprises of four blocks. The first block of the program for area load measurement is done through simple mathematical operation with measured data. And, the calculation results are transformed as an input for artificial neural networks. Second and third blocks represent artificial neural network operations in corresponding objectives. In the first phase, top neural networks evaluate load level of each area with active/reactive power and transfer of estimated load for neural network is low. Based on area load level, lower neural networks determine load current and define satisfactory system topology of the objective function. The result is that block 4 is used as an input to determine control strategy. Block 4 determines the control strategy with system topology for previous load pattern and novel determined load pattern proposed by artificial neural networks.

This control strategy defines control sequence of switches in order to prevent unexpected faults during load transfer process. Generally, artificial neural networks are very efficient in pattern detection; while, typical computers are efficient in numerical process. Thus, for hardware development, blocks 1 and 4 are designed as a typical calculation principle and blocks 2 and 3 are designed as artificial neural networks in order to adopt a combined structure.

RESULTS AND DISCUSSION

Load data is placed in a remote measured line current in each line. Therefore, area load can be obtained by the following relationship through simple mathematical operations:

Area load relationship:

$$ZL_i = LP_i - \sum_{j=1}^{k} LP_{ij} \text{for} \qquad i = 1, 2, \dots m$$

Where m is the number of areas, and ZLi and LPi are load current and source-side line for area i, respectively. LPi is the jth line current from load side for area i, and k is the number of line sections from the load side for area i.

Since this paper focuses on distribution networks and the outputs of interest are related to this part of the network, it should be noted that the final diagram validated and used is illustrated in **[Figure-1].**
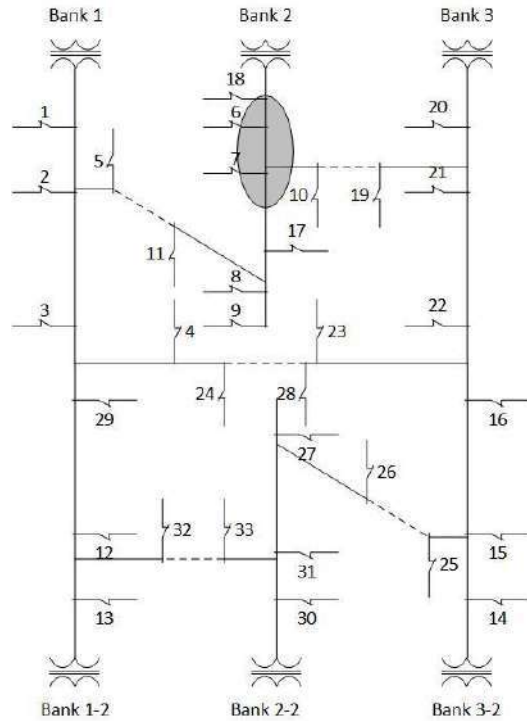
Fig: 1. Applied distribution system

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Process used in this paper is completed in two different modes. One mode is when distribution system is switched without artificial neural network. The other mode is when artificial neural networks arrangement is used.

System output without neural network:

The test system has 33 different buses [shown in **Figure- 1]** without artificial neural network that controls oscillations shown in [**Figure-2**] in 20-unit time range. Conventional control without artificial neural network needs 20-unit time ranges to stabilize 33-bus system with employing disturbances. However, when artificial neural network is present, only 12-unit time range is required to reach stabilized condition.
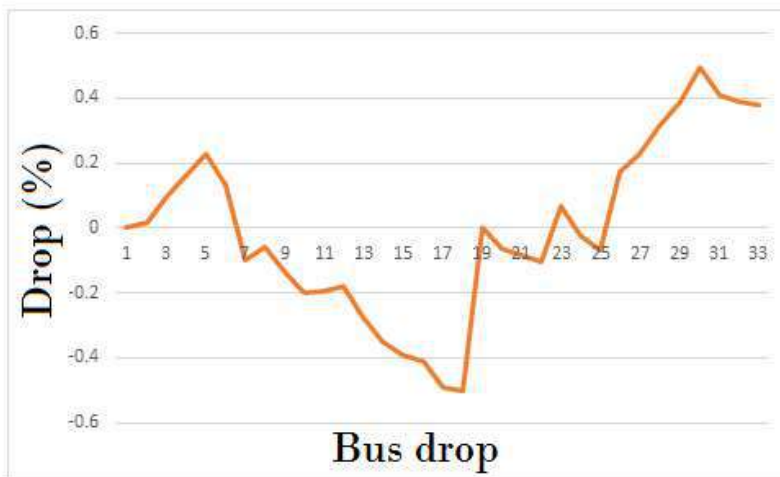
Fig: 2. Disturbances inserted into system for testing purpose

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Artificial neural networks not only have high speed, but also owe high accuracy. As seen in **[Figure- 3]**, the quality of controllers' performance is shown with ..?..
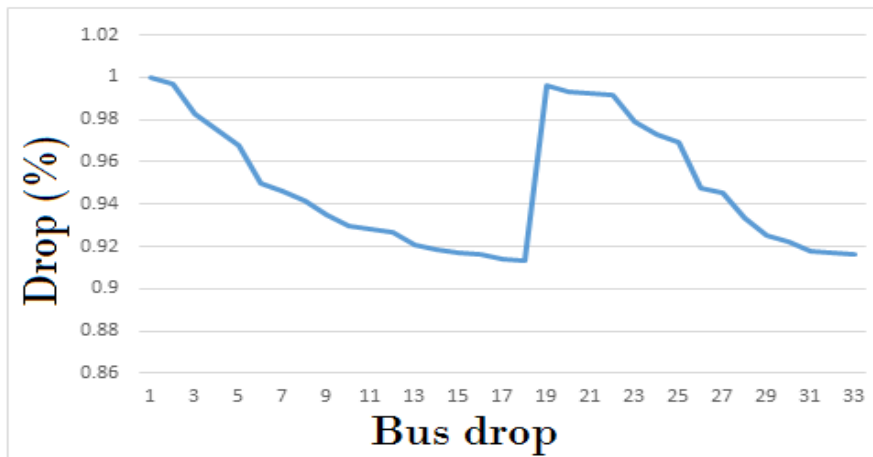
Fig: 3. Network quality on control of various buses

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Additionally, following results may be obtained when two general modes of conventional controls and neural networks are compared:
* Fixing of distribution system switching condition;
* Acceleration of distribution system stability;
* Enhancement of distribution system quality;
* Decrease of oscillations in distribution system;

CONCLUSION

* The proposed method is a practical technique to control power switches in power system;
* The amount of network changes is decreased remarkably due to the presence of high consumption devices;
* Damages resulting from electricity interruption on electric devices in household and industrial sectors are

significantly reduced;

* The designed algorithm in this paper is greatly appropriate because it can reduce drops due to power shortage for power networks' topology.

* The method proposed in this paper can improve a number of serious issues in the system including power distribution system.

* Due to having no basic changes in network structures, implementation of the novel algorithm is cost-effective, easy to implement, and more convenient.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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None

FINANCIAL DISCLOSURE
None

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ARTICLE　　**OPEN ACCESS**

DESIGN AND SIMULATION OF NEW FRACTAL MODEL TO IMPROVE BOTH THE PERFORMANCE AND ENHANCE THE UPTAKE OF ELECTRIC OPTOELECTRONICS APPLICATIONS

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ABSTRACT

Efficiency increase of photovoltaic systems and the increase in produced lights from electronic devices have led to ever-increasing demand to find structures that can meet the requirements of both applications. In this regard and with the aim of designing and simulating possible structures, first in this paper, more conventional and simpler structures of Grating and Grid are addressed. Then, this issue will be studied by presenting Hilbert fractal structure. Fractal structures have desirable values in terms of light absorption and they transform all the absorbed lights into energy. The results of this research reveal that the Hilbert structure has higher and more appropriate quality compared to other structures in terms of light absorption and power generation. Thus, production of optical devices is a logical process, and, it is recommended as a widely used plan for optical device manufacturers.

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INTRODUCTION

Prior to presenting fractal structure, its application, advantages, and etc., it should be noted that the aim of using fractals and similar networks is first to filter received wavelengths, meaning that a part of the wavelengths is absorbed and the remaining part is left (the main contribution of the current paper). In addition, another goal is light production and development of devices such as plasmonics that are beyond this paper's scope.

A fractal is a multi-part geometrical figure, each part of which has sharp edges that can be divided into sub-parts. Each sub-parts are similar to down-scaled main structure. Obvious features of fractals are self-similarity and being independent of scale. Fractal is widely available in the nature; in fact, the idea of these networks is inspired by the nature. Most of the geometrical structures are created from fractal. For example, Sierpinski triangle, Koch snowflake, the curve of the piano, the Mandelbrot set all are fractal. In addition, most objects in real world, including clouds, mountains, turbulence, and beaches which are not simple geometrical figures also define fractal. **[Figure- 1]** depicts several fractals in mathematics. Fractal is a new branch of science, art, mathematics and recently electromagnetic physics. The majority of physical systems available in the nature or man-made systems are not originated from Euclidean geometry. Rather, structural and description features of these phenomena should be expressed by fractal geometry [1].
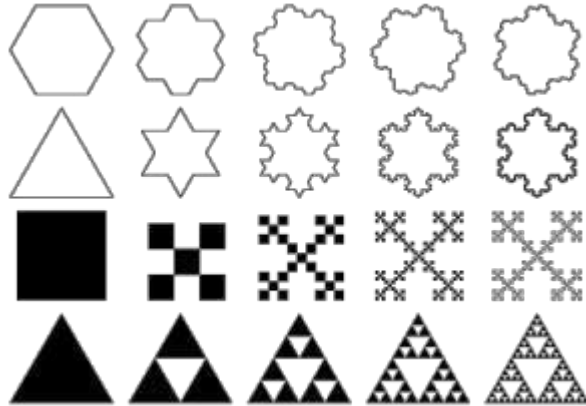
Fig: 1. A number of fractal in mathematics

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Nowadays, fractal, or fractal geomety in general, is used in information theory, economics, medical science, aerospace science, hardware design, image processing and other engineering and empirical fields. One of the main features of fractal geometry is that it has irregularity characteristic in various sizes; while, Elucidean geometry has no such characteristic [2].

The most important feature of fractal and fractal geometry is fractal diemension. In Elucidean geometry, dimensions of point, line, square and cube are 0, 1, 2, and 3, respectively. Overall, dimension of a set is described as the space it occupies. However, in fractal geometry, there exist various dimensions such as topological dimension, similarity dimension, Hausdorff dimension, and box-counting dimension [2].

Transparent electrodes based on lead oxides such as indium tin oxide or zinc oxide play an important role in devices such as lasers, solar cells, light emitting diodes (LEDs) and displays and increase the efficiency of various kinds of optical devices. However, their performance is far from ideal state because they are costly, fragile and unsuitable for use with certain organic materials. Various steps involved in the development of transparent electrodes can be seen in **[Figure- 2]**.
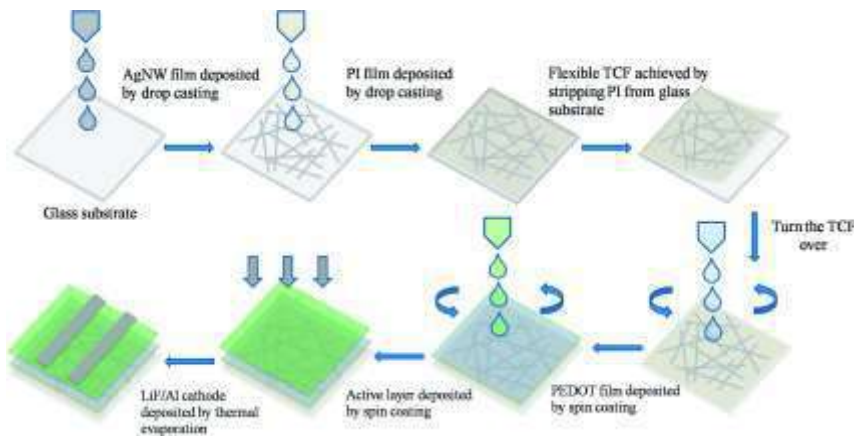
Fig:2. Various steps involved in developing transparent electrodes

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The use of fractals with narrow layers is one of the in-progress options to find appropriate alternatves with conducting materials in photonic field. The merit of these structures is higher robustness and proper electric current conductivity [3-4].

Fractal aplications

Fractals which are considered as a novel branch in electromagnetic science have various applications in optical fields. These applications that are fundamantal sub-sets of optoelectric are divided into three sub-branches that will be addressed in the next sections.

1. Light wavelength filtering

Since fractals have the ability to absorb light in different wavelenghts and are adjustable, they can be used to separate wavelengths in the ultraviolet, visible and infrared regions. This has widespread applications, some of them will be described. Before presenting these applications, it should be noted that these cases by the existing techniques are difficult and are considered among great advantages of fractal structures.

In solar panels in order to separate infrared wavelengths, absorb them, and pass the remaining wavelengths to avoid of heating in solar panels for panels' efficiency increase.
- Production of cold light projectors in hospital operating rooms.
- Manufacturing of UV lamps in applications such as lithograph film print with higher quality.
- Creating ultraviolet lamps to print laminates on the PC board and IC devices fabrication.

2. Laser

Optic and laser knowledge have seen huge advances in recent decades. Considering the brilliant future and its ever-increasing applications, it is required to train expert staff familiar with theoretical bases and practical fundamentals. [6]

3. Optical detectors:

Optical detectors are important part of optical integrated circuits (ICs). Metal-semiconductor-metal optical detectors are one type of optical detectors. Characteristics of these detectors has been improved with the advancement in plasmonic science [3, 5].

Simulated structures
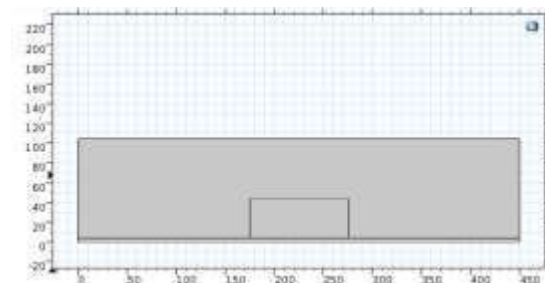
(a)
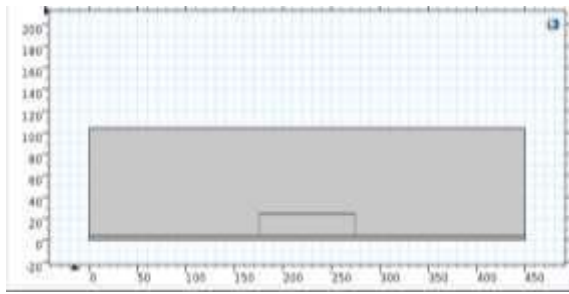
(b)
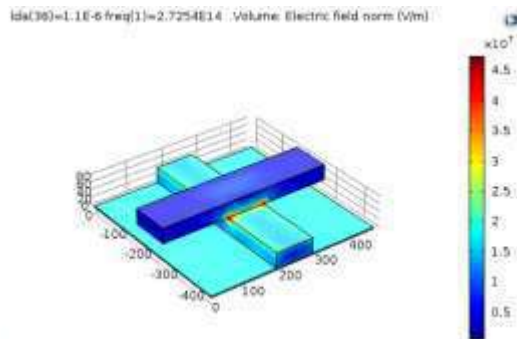
(c)
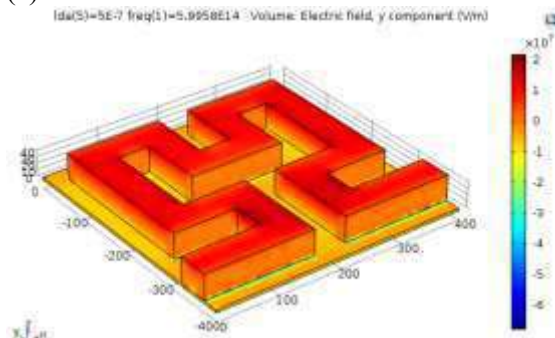
(d)

Fig: 3. simulated structures (a) Grating structure (side view) (b) Aluminum depth decrease (c) Grid structure (d) fractal structure

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Transmission

Wave Length (nm)

(a)

Transmission

Wave Length (nm)

(b)

(c)

(d)
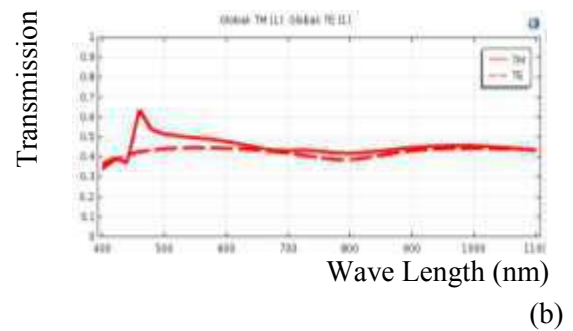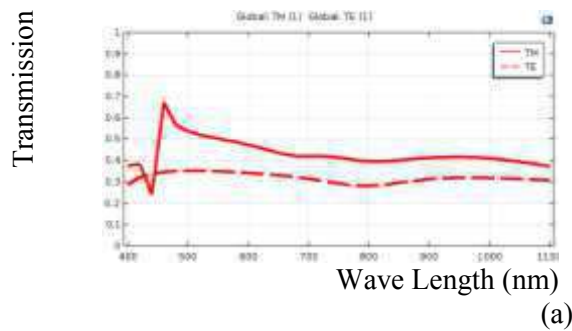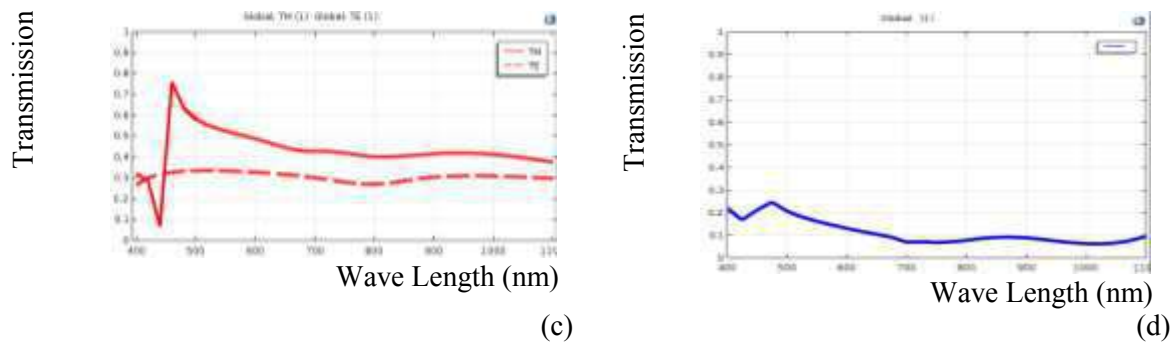
Fig: 4. Obtained outputs (a) Grating structure (side view) (b) Aluminum depth decrease (c) Grid structure (d) fractal structure

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CONCLUSION

Designed transparent electrodes in fractal structure have the ability of connection and adjustment with various devices. This feature has led to widespread use of this design. This structure has two probes in large scales that can be connected to the other devices. Design and simulation of transparent electrodes based on fractal structures, and based on Grid and fractal structure for 2-D and 3-D optoelectric applications which are among the most used techniques in optoelectric field revealed that more uniform passing through TM and TE angles in fractal structure have more appropriate performance. Designed electrodes in fractal structure of this paper with the development of proper wavelength window can have light passing in simultaneous manner with electric current and eliminate existing obstacles against light exchange of optoelectronic device. Based on the results of the current research, one can show superior performance of fractal geometris compared to grid and network with similar geometrical parameters through integration of silicon optical detectors and photon measurements. Indeed, nano-structure metal film with fractal gap is proposed as novel transparent geometries with high bandwidth and polar independent transform and has high performance. By investigating the transfer and other relationships, it can be concluded that there is a direct relationship between transfer and coverage close to penetration threshold or close to infrared band region.Since metals as a substrate metal film has higher absorption even in minimum passing of fractals and their passage quantity does not change in high wavelengths, it can be asserted that fractal regular patterns created on metal films in this paper are able to use these structures as a transparent electrode.

Chromatcic curves of passing value of sub-structures composing main structure which is addressed as a novel issue in this paper maniests that fractals can have more uniform passing compared to other structures. It has significantly higher performance stability than simple structures of Grating and Grid. This is cpmpatible with the results of previous studies.In the analysis of the simulation of one part of a fractal with the overall structure giving similar results, it can be mentioned that there is no need to depict overall structure for investigation and simulation of novel structures and only the illustration of structure main part is adequate for understanding performance procedure of the overall structure. In addition, higher analysis and simulation times are obviated.

As a novel and un-investigated issue, in this paper, structure depth parameters and air layer depth are studied. The results obtained reveal that in both states, depth decrease leads to performance stability in various wavelengths. That is, regarding both air layer depth decrease and fractal layers decrease, minimum and maximum passing in various wavelengths approach to the mean passing of different wavelenghts. Thus, it can be asserted that these two layers have direct performance.If electrode structure of simulation parameters assumed to be independent, their impact on optical permeability is depend on shape and kind of electrode structure.

None

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BLOCK DESIGN ANALYSIS OF CURRENT AND VOLTAGE AC SINGLE-PHASE AND THREE-PHASE INDUCTIVE LOAD IN SIMULINK MATLAB

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ABSTRACT

One of the most commonly used in power electronics components are SCR(silicon controlled rectifiers).So there is a need for cognition and work with SCR. Since for analysis SCR should be used Simulink in MATLAB and circuit half control Single-phase to full control three-phase should be implemented in Simulink, In this paper it's written on that.

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INTRODUCTION

In recent years due to the development of the electricity industry in the field of power electronics industry also has a significant progress. With the advent of semiconductor devices and components are used whose structure is based on semiconductors, these devices have earned a special place in power electronics, one of the most practical pieces of equipment SCR, which used as key. The key mechanical motion resulting in longer life and also due to the high speed (about microseconds) One of the benefits this piece is attributed to mechanical keys. After taking into account what was said about the use of SCR had to consider the role of this piece in the converter circuit. As we know in dc to ac or ac to dc converters need to use SCR is controllable with existing drivers to be launched and for purposes of control are required. These circuits are important in power electronics applications and many social, of this converter can be controlled from the bridge or bridge all control three-phase and single-phase all ... named. The first step is to design the circuit in the circuit design is implemented in software environment To the analysis system software bugs and preliminary results discern; One of the most powerful engineering software is MATLAB, Given that in this environment software for circuit simulation in the name of Simulink embedded, MATLAB software into one powerful computing and analytical tools for electrical engineering has become; So be expected if the converter mentioned in the software simulation environment that simulates .Since the simulation of the converter requires the selection of different elements of the library space is Simulink software (and the most important driver of timekeeping is that the process itself);In this paper we shall try the program this converter, together with its drivers to be written (even it can be used as blocks in Simulink library)and Finally, we have to consider its results can Conclude that, by a good percentage desired response is achieved.

METHODS

Electric load
There are 3 types of resistance in alternating current.
Ohmic: The amount depends on the frequency is not a pure ohmic resistance and frequency variations in the amount it is ineffective. The voltage across the resistor R will be displayed as follows.[2,3]

$$u\_R = u\_m \ \sin(\omega\_t) \qquad (1)$$

ELECTRICAL ENG

The relationship between flow and the ohmic resistance R passes can be calculated.
I_R=u_R/R   (2)
Now in placeu_R we putthe same amount that.

I_R=(u_m sin⁡(ω_t))/R (3)
I_R=i=I_m sin⁡(ω_t)   (4)

As can be seen, thedo not have any phase shift between current and voltage.

Induced Reactance: Induced resistance shown byX_L .in Reactance resistance Against ohmic resistance, R is frequency-dependent . X_LAmount obtained from the following equation[1,2]

X_l=ω .L   (5)

According to equationω=2πfcomes to the following equation.

X_l=2πf .L   (6)
Induced resistance phase shift 90 degree between current and voltage occurs. In other words, the induced resistance Currentis 90 degrees behind from voltage.

2.3-Capacitive resistance: Induced resistance shown byX_c. In Capacitive resistance against ohmic resistance, R is frequency-dependent.[2]

X_c=1/(c.ω)
 (7)
Therefore
X_c=1/(c.2πf)   (8)
Capacitive resistance phase shift 90 degree between current and voltage occurs. In other words, the capacitive resistance Current is 90 degrees forward from voltage.
Because the load on the network are the engine for more power. So ideally all load is of inductance.

SCR

The silicon control rectifier (SCR) consists of four layers of semiconductors, which form NPNP or PNPN structures have three P-N junctions labeled J1, J2 and J3, and three terminals. The anode terminal of an SCR is connected to the p-type material of a PNPN structure, and the cathode terminal is connected to the n-type layer, while the gate of the SCR is connected to the p-type material nearest to the cathode [4]. An SCR consists of four layers of alternating p- and n-type semiconductor materials. Silicon is used as the intrinsic semiconductor, to which the proper dopants are added. The junctions are either diffused or alloyed (alloy is a mixed semiconductor or a mixed metal). The planar construction is used for low-power SCRs (and all the junctions are diffused). The mesa-type construction is used for high-power SCRs. In this case, junction J2 is obtained by the diffusion method, and then the outer two layers are alloyed to it, since the PNPN pellet is required to handle large currents. It is properly braced with tungsten or molybdenum plates to provide greater mechanical strength. One of these plates is hard-soldered to a copper stud, which is threaded for attachment of heat sink. The doping of PNPN depends on the application of SCR, since its characteristics are similar to those of the thyratron. Today, the term "SCR" applies to the larger family of multilayer devices that exhibit bistable state-change behavior, that is, switching either on or off [4]. The operation of an SCR and other SCRs can be understood in terms of a pair of tightly coupled bipolar junction transistors, arranged to cause the self-latching action.

SCR Turn-On
1.   forward-voltage triggering
2.   gate triggering
3.   dv/dt triggering
4.   temperature triggering
5.   light triggering
Forward-voltage triggering occurs when the anode–cathode forward voltage is increased with the gate circuit opened. This is known as avalanche breakdown, during which junction J2 will break down. At sufficient voltages,

the SCR changes to its on state with low voltage drop and large forward current. In this case, J1 and J3 are already forward-biased.
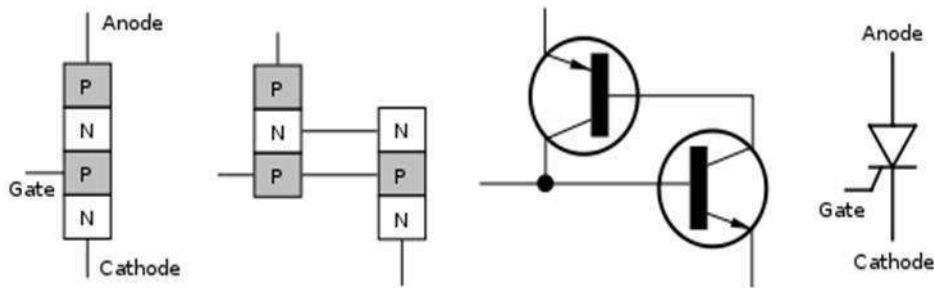
Fig: 1. Schematic Figure and internal structure SCR

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SCR Turn-off Transient

When a reverse bias is applied to the SCR anode in order to turn off the device, it is possible to distinguish four separate phases of the ensuing transient: two storage times and two fall times. The device recovers first at the n-emitter junction because there are only very few electrons injected from the wide n base into the Narrow p base. The opposite is true for the n base, since the p base injects heavily into it and replenishes holes as fast as they are collected by the reverse-biased anode. The n-emitter junction breaks down as soon as the junction recovers its depletion region if the applied external potential is high enough. The first storage time and fall time are comparatively short. The second storage time is required to remove the excess charge from the long n base where the holes are continuously replenished by injection by the p base. Finally, all the charge disappears almost at the end of the second fall time. Fast turn offs can be achieved for devices which have low minority-carrier lifetimes (gold doping) and are turned off with high reverse currents. The reverse biasing of the device gate may speed up primarily the first phase of the turn-off transient. If a forward voltage is reapplied prematurely to an unidirectional SCR (SCR) after the forward anode current ceased to flow, the device will go into the conduction state again. Because of the stored charge present, it is necessary to wait for a definite interval of time after current cessation before the Reapplication of the forward potential if the device is expected to block the reapplied voltage. The turn-off time is the time necessary for the removal of the excess charges from all the parts of the p-n-p-n device. In many practical applications the forward current is removed from the SCR by the reversal of the current flow in the outside circuit; the decreasing anode current passes through zero and goes negative. It has its maximum value just after the reversal and decays until all the excess charges are removed and a depletion layer has fully developed across the reverse-blocking junction. Only then is the SCR ready for the reapplication of the forward potential. Generally speaking, the device can be turned off not only by the application of a reverse potential but also by opening the external circuit or by applying a reverse bias to the device gate. The most rapid turn-off is achieved when the anode current is reversed with simultaneous reversal of the gate current. We consider first the case when the anode current only is reversed; consequently, the two outer junctions, which were forward biased during the on state, become eventually reverse biased. The effect of the additional application of the reverse gate current is shown, then, to decrease the turn-off time. The device behavior can be analyzed one-dimensionally by the charge-control method using the superposition principle [5-8].The results of the one-dimensional analysis are applicable obviously with greater accuracy to structures with narrow emitters.
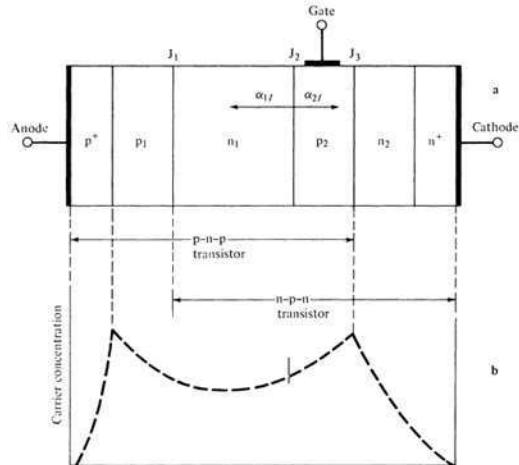
Fig: 2. An SCR and an approximate carrier concentration at *t* = O

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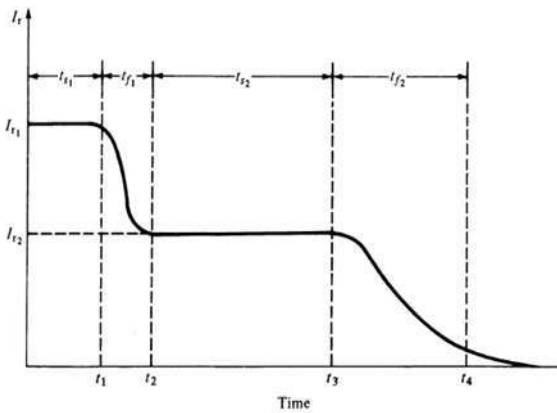
Fig: 3.Four turn-off phases [7].

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[Figure- 8.1] represents a p-n-p-n device just prior to the application of the reverse potential to the anode. For the reverse-bias turn off, the current waveform may be divided into four regions corresponding to the four turn-off phases [Figure- 3].

Storage time(t_(s_1))

The n base in a power device is usually uniformly doped with very low impurity concentration ($\sim [10]^{14}$ atoms/cm3 or less). Thep base, on the other hand, is doped no uniformly and may have an average impurity concentration on the order of $5 \times [10]^{15}$ atoms/cm3. As a result, in the forward-blocking state when the center junction J2 is forward biased and injecting, its emitting efficiency is good from the p base into the n base, but very poor in the opposite direction. For this reason, the turn off of the p-n-p-n device starts with the removal and decay of excess minority-carrier concentration (electrons) from the p base when the n-emitter efficiency is high. The reverse-biased cathode (positive) has to collect only the charges (electrons) present in the p base which are hardly replenished by the injection from the n base. It is not so in the n base, since as soon as the charges (holes) are collected by the reverse-biased anode (negative), more holes are injected efficiently by the p base into the n base. Consequently, the turn off starts with the n-emitter junction J3.During the t_1 [Figure-3] the current through the device is constant because there is a large charge stored in the p base which allows the current to flow when the bias is reversed. As long as the excess charges are not entirely removed from the p-base junction, J3 will remain forward biased despite the external voltage reversal. Neglecting the forward voltage drop across the device, the constant Current through the device during t_1 equals.

$I_{(r_1)} = v_r/R$ (9)

Where V_r. is the reverse voltage pulse amplitude and R is the circuit resistance (ohmic load is assumed). At the end of the time t_1, enough electrons are removed by the reverse (positive) potential applied to the cathode, the depletion region of the J3 junction begins to widen, and J3 starts supporting the reverse bias [5-7]. Using charge-storage relationships, it is possible to obtain the following expression for the first storage time (notation as per **Table- 1 and Figure- 2]**:

$t_{(s_1)} = \tau_2 \ln[(\gamma_{1I} I_{r1} + A_P I_F)/((1-\alpha_{2I})I_{r1})]$ (10)

$\alpha_{2I} = \beta_{2I} \gamma_{2I}$ (11)

Where I_F is the on-state current, A_P is a constant, τ_2 is the lifetime in the p-base, γ_{1I} is the emitter efficiency of the p2-nl-p1 transistor, α_{2I} is nl-p2-n2 transistor DC gain, β_{2I} is the nl-p2-n2 transistor transport factor, and γ_{2I} is the nl-p2-n2 transistor emitter efficiency. For $\alpha_{2I} \gg 1$ and $\gamma_{1I} \approx 1$, this expression reduces to a simple relationship

$t_{(s_1)} = \tau_2 \ln(1+A_P I_F/I_{r1})$ (12)

Thus, the first storage time can be made small if the lifetime in the p- base is short and/or the reverse current is high.

Fall time ($t_{(f_1)}$)

There are two possible situations that should be considered: (1) the n-emitter junction recovers, i.e., its depletion region builds up, but the externally applied voltage is smaller than the junction breakdown voltage; and (2) the applied voltage is large enough to cause the breakdown of the n-emitter junction J3 (or the n emitters shorted).

Table 1:
Notation used for the turn-off transient analysis

Parameter	n_2-p_2-n_1 transistor	n_1-p_2-n_2 transistor	p_1-n_1-p_2 transistor	p_2-n_1-p_1 transistor
Common base DC current gain	$\alpha_N = \gamma_2 \beta_2$	$\alpha_{2I} = \gamma_{2I} \beta_{2I}$	$\alpha_P = \gamma_1 \beta_1$	$\alpha_{1I} = \gamma_{1I} \beta_{1I}$
Transport factor β_2	β_{2I}	β_1	β_{1I}	
Emitter efficiency γ_2	γ_{2I}	γ_1	γ_{1I}	
Base transit time T_2	T_{2I}	T_1	T_{1I}	
Minority-carrier lifetime in the base τ_2	τ_2	τ_1	τ_1	

Letter I is used for inverse parameters **[Figure- 2]**.

In the first case it was shown by Sundresh [7] that the decaying current has the for

$I(t) = (K_1 \tau_2)/T_{2I} I_{r1} \exp((-t)/\tau_2)$ (13)

With

$K_1 = \gamma_{2I}(1-\beta_{2I})$ (14)

and the origin for time is assumed to be at the end of $t_{(s_1)}$; T_{2I} is the minority carriers' (electrons) transit time in the p base in the inverse direction from the n base toward the n emitter. when there is no breakdown, the expression (12) permits the determination of the first fall time. The second case in which breakdown occurs is usually more important from the practical point of view and corresponds to high-node reverse-applied potentials. For this case [7]

$t_{(f_1)} = \tau_2 \ln[\tau_2/T_{2I} \gamma_{2I}(1-\beta_{2I})(I_{r1} R)/(I_{r1} R - V_B)]$ (15)

V_B is the n-emitter (junction J3) breakdown voltage. The requirements for the short fall time $t_{(f_1)}$ are: small minority-carrier lifetime in the p base, low breakdown of the n-emitter junction, and low injection efficiency from the n base into the p base.

5.3. Storage time ($t_{(s_2)}$)

As the voltage reaches the avalanche breakdown of the n-emitter junction J3, the voltage drop across J3 becomes constant and remains in series with the rest of the device which consists of the p-n-p portion still conducting fully and contributing a negligibly small voltage drop. As soon as J3 breaks down, a second storage time starts, during which the current remains essentially constant and can be determined from.

$I_{(r_2)} = ((V_r - V_B))/R$ (16)

The center junctionJ2 is a good emitter of holes and an inefficient emitter of electrons so that the hole injection into the n base from J2will continue as long as J2 is forward-biased. The n base recovers then more slowly than the p base because of this continuous replenishment of holes. Using the charge-control method, it is possible to obtain a simple expression for $t_{(s_2)}$. If we assume for simplicity that. the fall time $\tau_{(f_1)}$ is negligibly small and both emitters (n and p) have unity gamma, then for high-anode reverse-bias

$$t_{(s_2)} = \tau_2 \ln(C_1 + C_2 \, I_f / I_{(r_2)}) \quad (17)$$

where C_1 and C_2 are algebraic functions of the normal- and reverse-current gains[5]. Here again, large reverse current and short minority-carrier lifetime in the n base will reduce the duration of the storage time.

5.4. Fall time ($t_{(f_2)}$)

Assuming that the carrier flow during this phase is by diffusion only and that the charge distributions in both bases are linear, it is possible to obtain an analytical expression linking the currents to the charges in each base [7]. In power SCRs we have usually $\gamma_{2I} \gg \gamma_{1I}$ and the current during the second decay time may be expressed by

$$I(t) = I_{(r_2)} \, \tau_1 \, \gamma_{1I} \, (1 - \beta_{1I}) \; 1/T_{1I} \; \exp((-t)/T_{1I}) \quad (18)$$

where τ_1 is the lifetime in the n-base, β_{1I} is the p_2-n_1-$p_1$transistortransport factor, and T_{1I} is the p_2-n_1-p_1 transistor base transit time. The fall time $t_{(f_2)}$can be determined from (18) by letting the current$I_{((t))}$drop down to the holding current level; for instance,

$$t_{(f_2)} = T_{1I} \, \ln \left(I_{(r_2)} \, \tau_1 \, \gamma_{1I} \, (1 - \beta_{1I}) \right) / (I_h \, T_{1I}) \quad (19)$$

The second fall time can be decreased by short minority-carrier lifetime in the n base and short inverse transit time.

The same data show the direct proportionality of the saturation times to theminority-carrier lifetimes in respective device bases The circuit commutated turn-off-time T_q measurements! confirm essentially the validity of the above theoretical considerations in so far as the total switching time is concerned, since$T_q$behaves qualitatively in the same way as switching time $t_{(s_1)} + t_{(s_2)} + t_{(f_1)} + t_{(f_2)}$.

RESULTS

Real waveform Simulink

The following Simulink we see controlled half-wave circuit that in the 2 stage is tested.In step 1, inductance load is 2 H and step 2 changes to 5 H. Results are as follows.m[**Figure-4a-4e**].
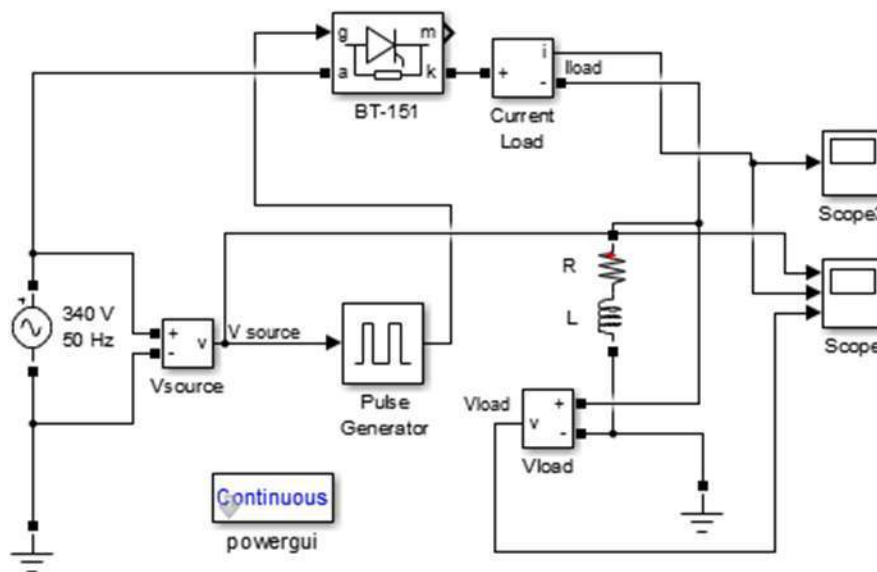
Fig:(4a). Simulink

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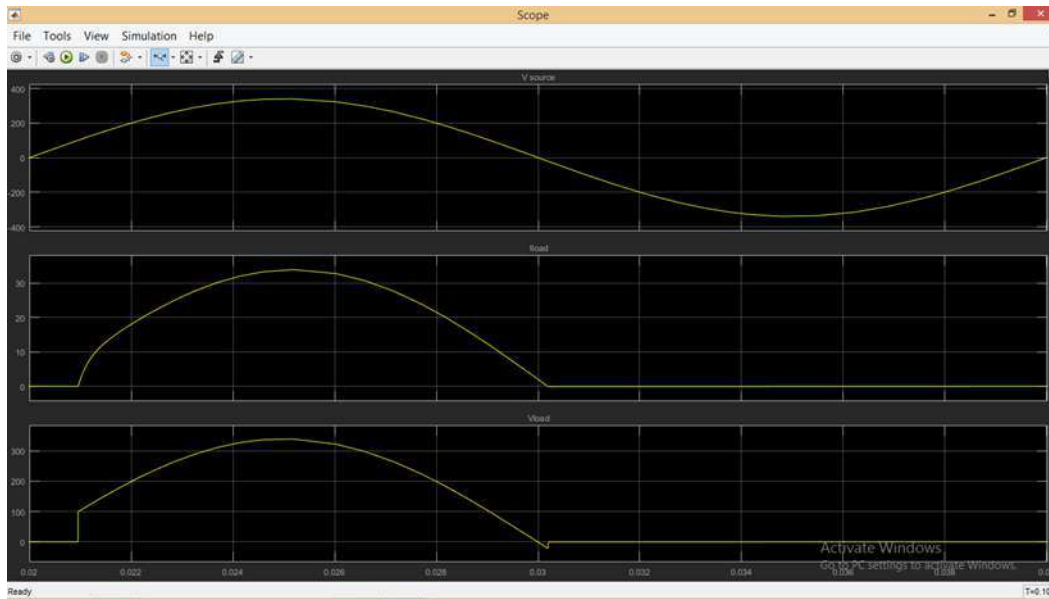
Fig: 4(b).Real Simulink Waveform(V source, I load, V load)Load inductance=2H

....
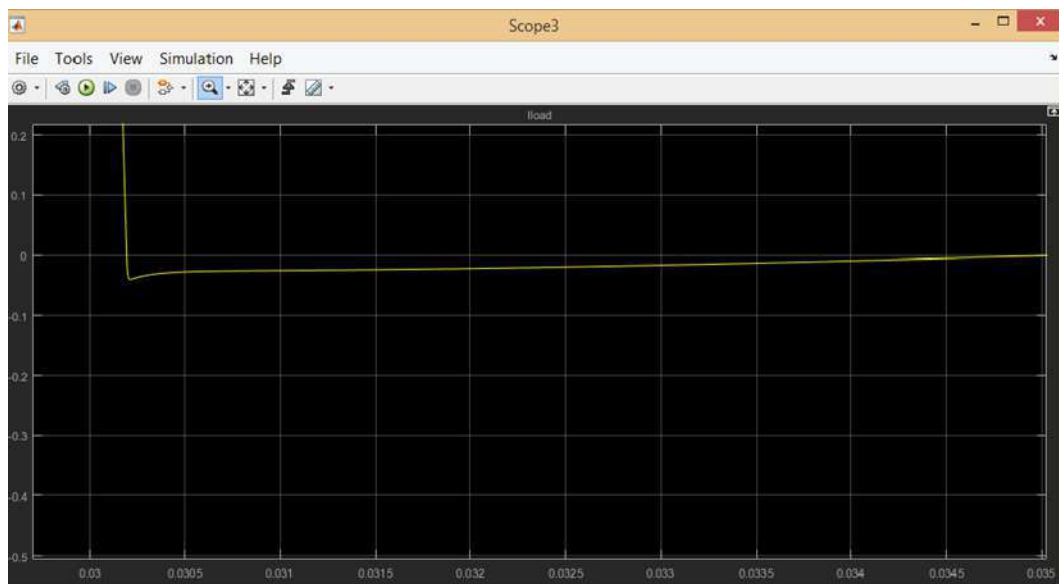
Fig: 4(c).I load (Detailed View) Load inductance=2H

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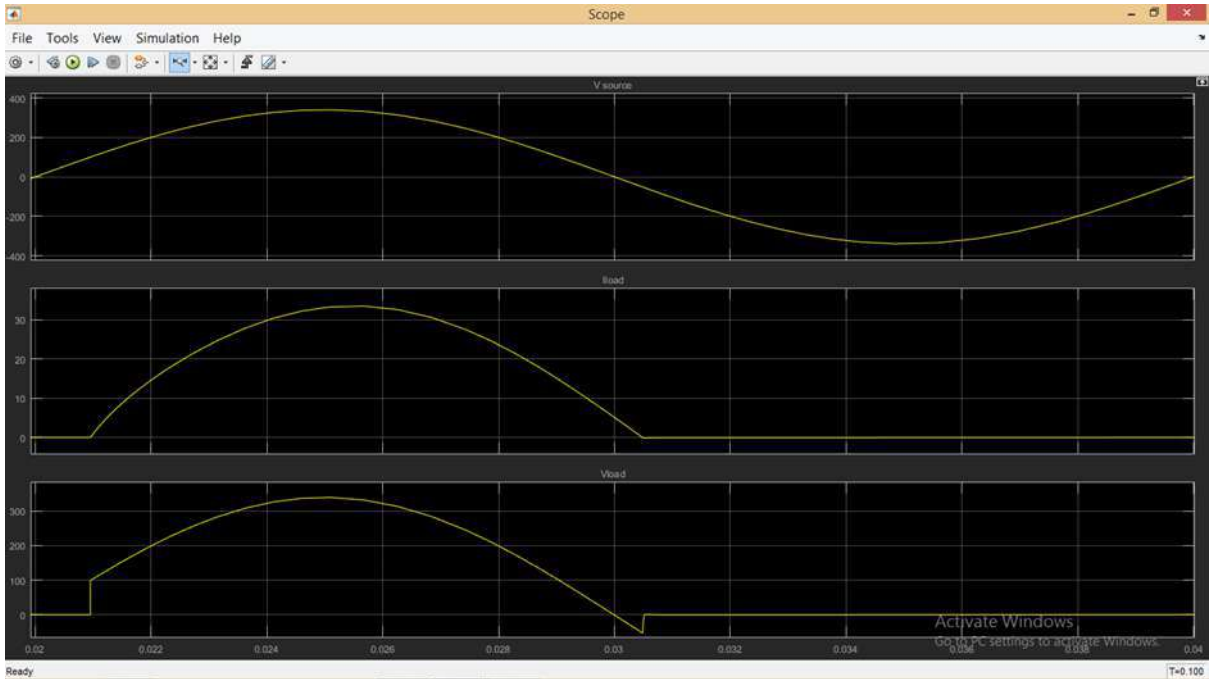
Fig: 4(d). Real Simulink Waveform(V source, I load, V load)Load inductance=5H

....
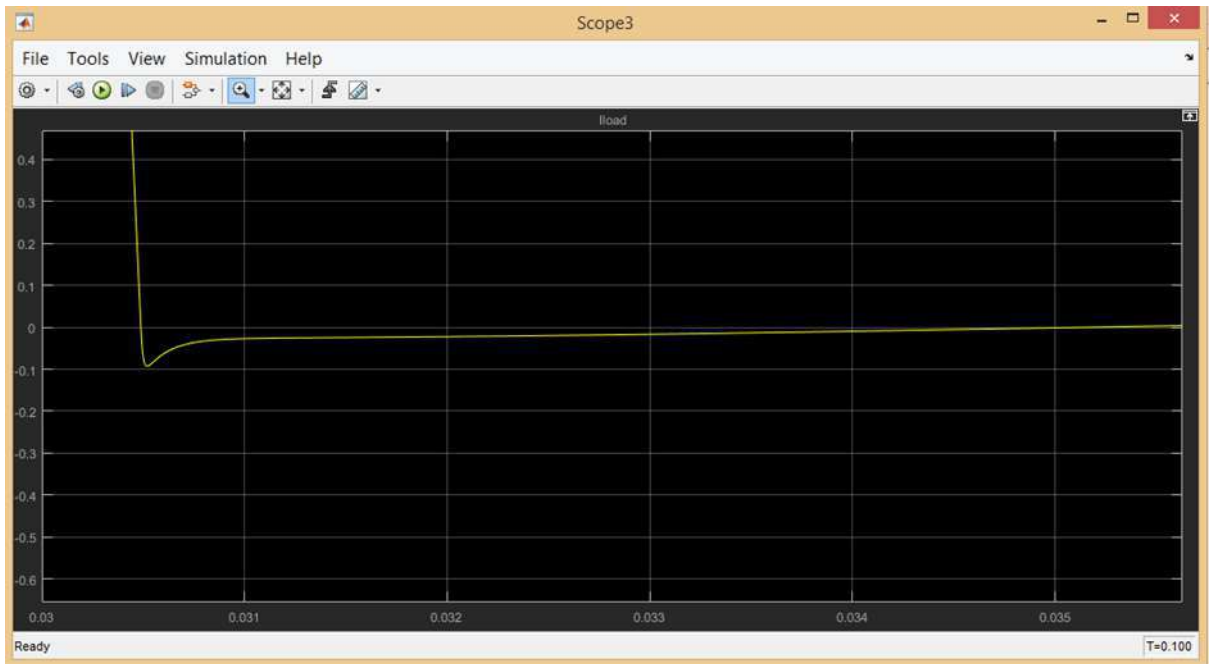
Fig: 4(e).I load (Detailed View)Load inductance=5H

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Result program (main Result)

Based on the above explanation wrote the following program The following parameters related to certain intrinsic is a SCR BT-151 which has been extracted from the data sheet.

V_B=500(n-emitter (junction j3) breakdown voltage: 500 v)
I_h=.007(I_h=7mA-20mA)
A_P=1(constant: 1)
I_f=.012(on-state current: 12mA)
τ_1=5× 10^{-9}(lifetime in the p-base: 5 ns)
τ_2=3× 10^{-9}(lifetime in the p-base: 3 ns)
β_{1I}=.5(transport factor of the p2-n1-p1 transistor: 0.5)
β_{2I}=.2(transport factor of the n1-p2-n2 transistor: 0.2)
T_{1I}=.02(minority carrier transit time Tr p2-n1-p1: 20 ms)
T_{2I}=.05(minority carrier transit time Tr n1-p2-n2: 50 ms)
I_{r_1}=1(emitter efficiency of the p2-n1-p1 transistor: 1)
I_{r_2}=.5(emitter efficiency of the n1-p2-n2 transistor: 1)
C_1=1(reverse current gain: 1)
C2=1.1(reverse current gain: 1.1)

Single-phase half-wave:

In the first case(State1) the data resulting waveform to see‹The impact waveform is specified inductance inductive load .Now the program written to show the influence of the inductance of the inductive load will change its value from 2 to 5(State2), As to the effect of the inductance of the load on the current and voltage circuit was explained, In the second case, clearly the impact of the inductance waveform in the waveform turns out to be, So we can verify the correct operation of the written application accepted.**[Figure-5(a) to 5(d)]**
State1:
PeakV input=340
Frequency input=50
Load inductance input=2
Load Resistance input=10
Firing angle input=30
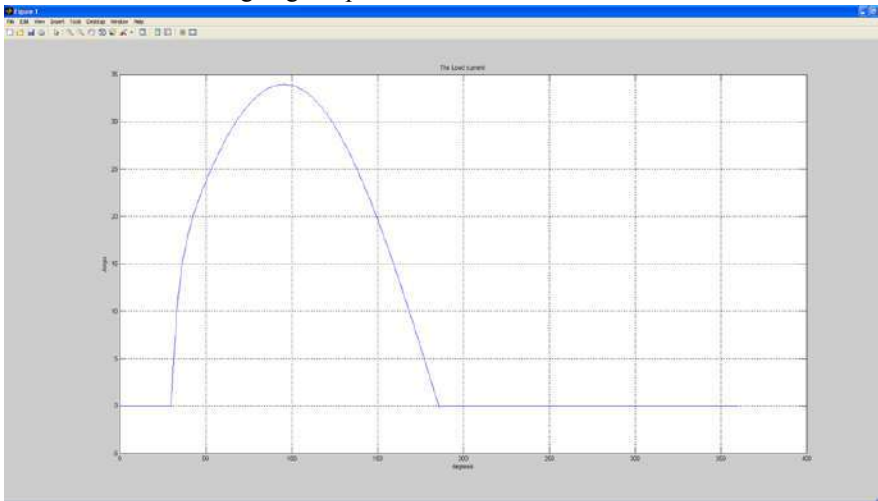
Fig:5(a).Result Waveform (Load current)

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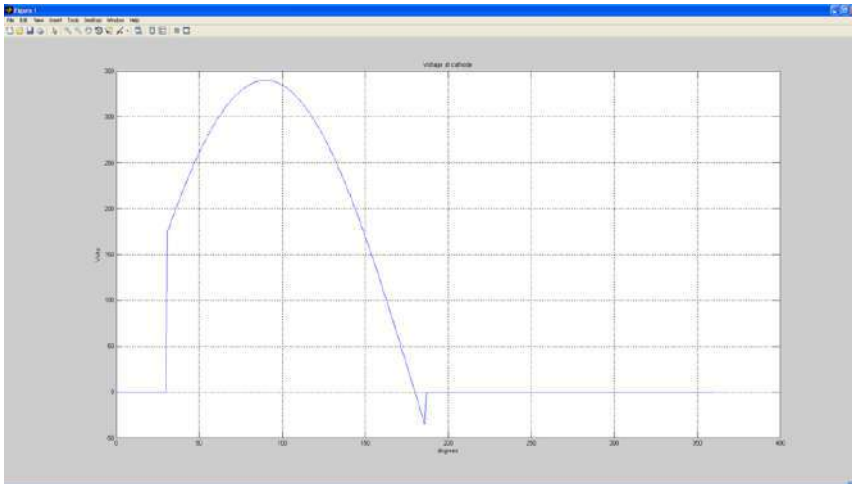
Fig: 5(b):Result Waveform (Load Voltage)

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State2:

PeakV input=340

Frequency input=50

Load inductance input=5

Load Resistance input=10

Firing angle input=30
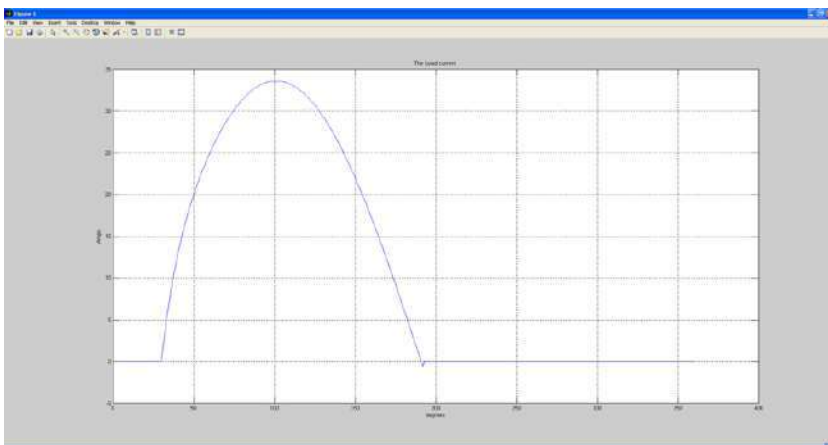
Fig:5(c):Result Waveform (Load current)

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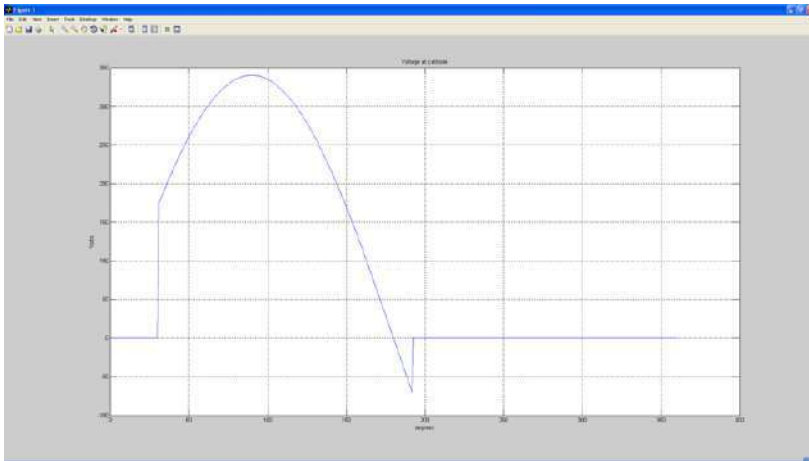
Fig: 5(d). Result Waveform (Load Voltage)

....

Single-phase full-wave:

A half-wave rectifier waveform in the following models can be viewed with inductive load.Figure(6)

PeakV input=340
Frequency input=50
Load inductance input=2
Load Resistance input=10
Firing angle input=30
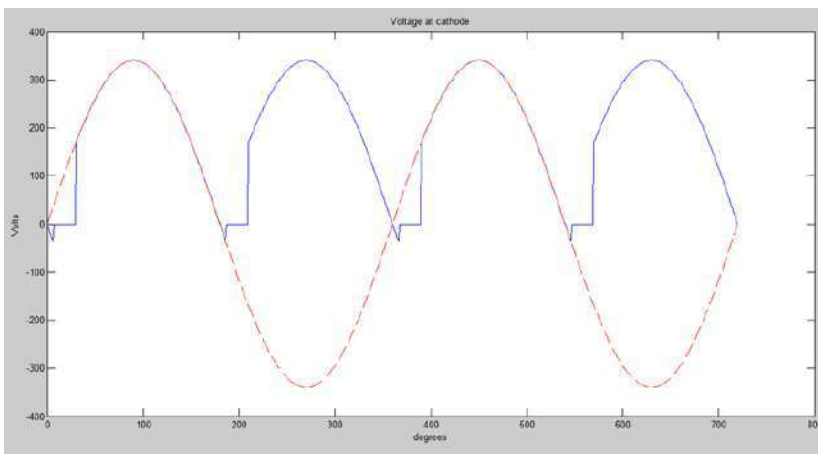
Waveform Voltage

Fig: 6.Waveform Voltage Single-phase half-wave

....

phase full-wave:

A 3-phase full-wave rectifier waveform in the following models can be viewed with inductive load.Figure(7)

PeakV input=340
Frequency input=50

Load inductance input=2
Load Resistance input=10
Firing angle input=30
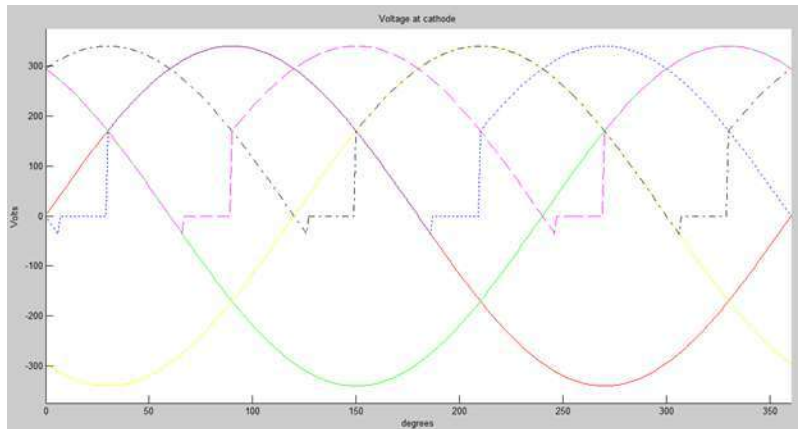
Waveform Voltage

Fig: 7. Waveform Voltage 3-phase full-wave

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CONFLICT OF INTEREST
Authors declare no conflict of interest

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None

FINANCIAL DISCLOSURE
None

REFERENCE

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ARTICLE   **OPEN ACCESS**

EFFECTS OF DIFFERENT PLANTING ARRANGEMENT ON YIELD AND YIELD COMPONENTS OF FABA BEAN (VICIA FABA)

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ABSTRACT

A field experiment was undertaken at educational and researchable field of Gorgan university-Iran during 2015 to determine the best planting armament of Faba Bean (ViciaFaba). This research was laid out in a randomized complete block design arranged with three replications. The planting patterns consisted of 3 levels; P1=single row, P2=parallel double row with 15 cm space and P3=zigzag double row with 15cm space, and plant density consisted of 4 levels; D1=75000 plant ha-1, D2=85000 plant ha-1, 95000 plant ha-1 and 105000 plant ha-1. Plant density was impressed the amount of pod product, biomass, grain/pod ratio and harvest index. The highest pod dry weight and total dry yield were 10.42 ton ha-1and 3.66 ton ha-1 respectively at the plant density of 75000 plant ha-1. While the great grain/pod ratio and harvest index parameters with amounts of 76.54 and 29.57% respectively got from low plant density (75000 plant ha-1). Combination treatment of planting patterns and plant density showed: high plant density (75000 plant ha-1) by double row pattern produced the most pod dry weight (3.99 ton ha-1) and total dry weight (10.85 ton ha-1). In contrast the highest harvest index (27.82%) was related to low plant density (75000 plant ha-1) with 15 centimeter double row planting pattern. Overall findings showed that double – row planting pattern had better performance compare to single row. Double - row planting arrangement where on double - row raised

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INTRODUCTION

With the increase in world population, demand for food consequently will grow. It is expected that human population will increase to over 8 billion by the year 2020 and this will worsen the current scenario of food security. Improved crop productivity over the past 50 years has resulted in increasing world food supplies up to 20% per person and reducing proportion of food-insecure peoples living in developing countries from 57% to 27% of total population [1]. It is predicted that at least 10 million people will be hungry and malnourished in the world by the end of this century [1].Thus, to reduce the food insecurity, crop production will have to be doubled, and produced in more environmentally sustainable ways [2].This can be achieved by expanding the area of crop production, increasing per hectare yield and improving crop quality. Furthermore, during the second half of the past century, rise in per hectare crop productivity was due to improved or high yield potential [3].

The relationship between growth of Faba Bean under different planting pattern is not well understood. Many changes take place in plants to enable them to compete and maintain photosynthetic activity. A consideration of the adaptation mechanisms by which density affects photosynthesis would aid the improvement of growth conditions and crop yield and would provide useful tools for future genetic engineering. Research in the late 1980s demonstrated that yields can be raised two to three-fold by using available improved varieties and appropriate agronomic techniques. But these findings need to be refined, improved and tested for local climatic, soil and crop conditions [4].

These include in the aspects of to what extent of planting pattern and plant density affect the yield and of Faba Bean (ViciaFaba). In addition, no comprehensive database is available on sweet corn under combination of pattern and density at north of Iran. Thus, studies are still needed to improve understanding of the effects of pattern for Faba Bean. Hence, the present study was designed to study the effect of planting arrangement on yield and morphological parameters of Faba Bean (ViciaFaba).

MATERIALS AND METHODS

The field experiment was conducted at the research farm of Gorgan university of Agricultural Sciences and Natural Resources, Iran in 2015. The farm was under wheat-soybean rotation. Geographical coordinate of the farm were 36°, 54.00´ N; 54°, 25.00´ E and altitude of 51m. The 25-year mean temperature, humidity and precipitation recorded were 17.7 °C, 70% and 617 mm, respectively. Table 1 shows some soil analysis of the farm.

Table :1. Some physical and chemical analysis of farm soil

CEC (Cmol/kg)	EC (ds/m)	OM (%)	pH	Soil texture	Sand (%)	Silt (%)	Clay (%)
20.60	0.88	1.8	8.2	silty- clay loam	18	46	36

Table1. Climatically data at Agricultural Research Station of Gorgan during the growth period of Sweet corn in three growing seasons 2005-2006.

Month	Precipitation		Mean temperature (c)		Mean of maximum temperature (c)		Mean of minimum temperature (c)		Evaporation (mm)		Mean of Relative humidity(%)	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
April	69.1	104.5	16.2	15.3	21.9	20	10.6	10.7	82	85.6	73.4	76.4
May	53.6	52.8	20.7	17.2	26.9	21.4	14.6	13	148.9	95.2	64.5	74.8
June	20.2	10.5	24	25.1	29.4	31.9	18.6	18.3	170.3	181.6	65.4	60.6
July	27.4	32	27.5	28.3	32.1	33.9	22.9	22.8	213.6	225.7	61.7	60.4
August	2.3	19	29.3	29.2	35.1	34	23.6	24.4	247.4	213.3	59	64.9

Y1 : 2005
Y1 : 2006
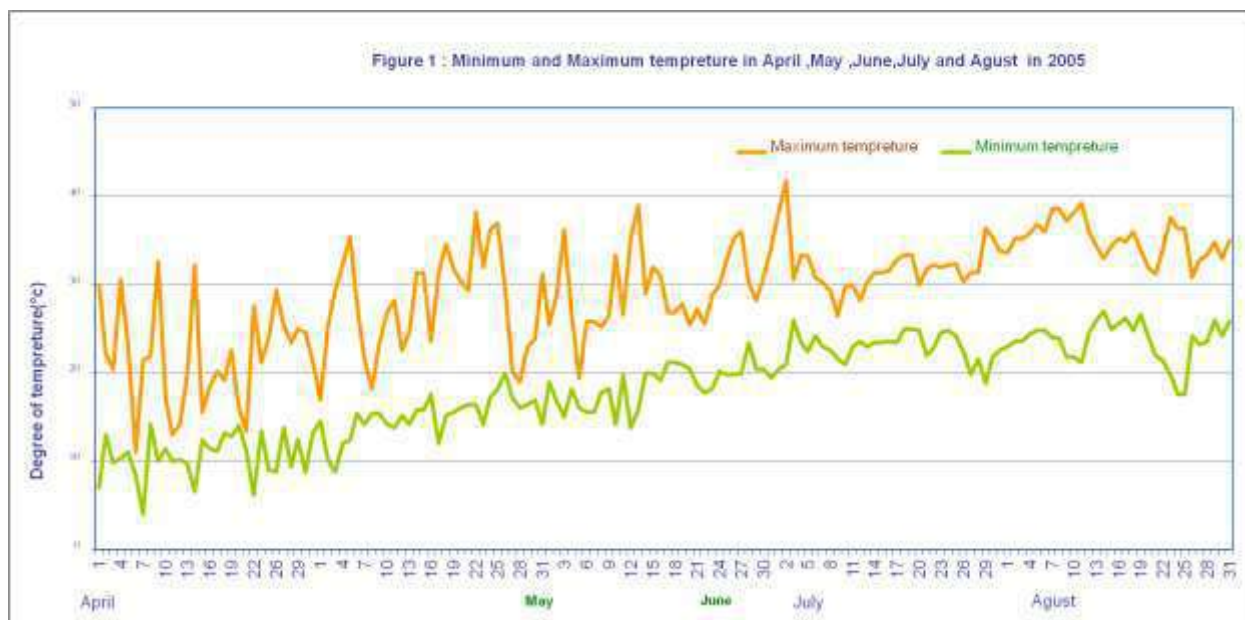
Fig.1: 2005
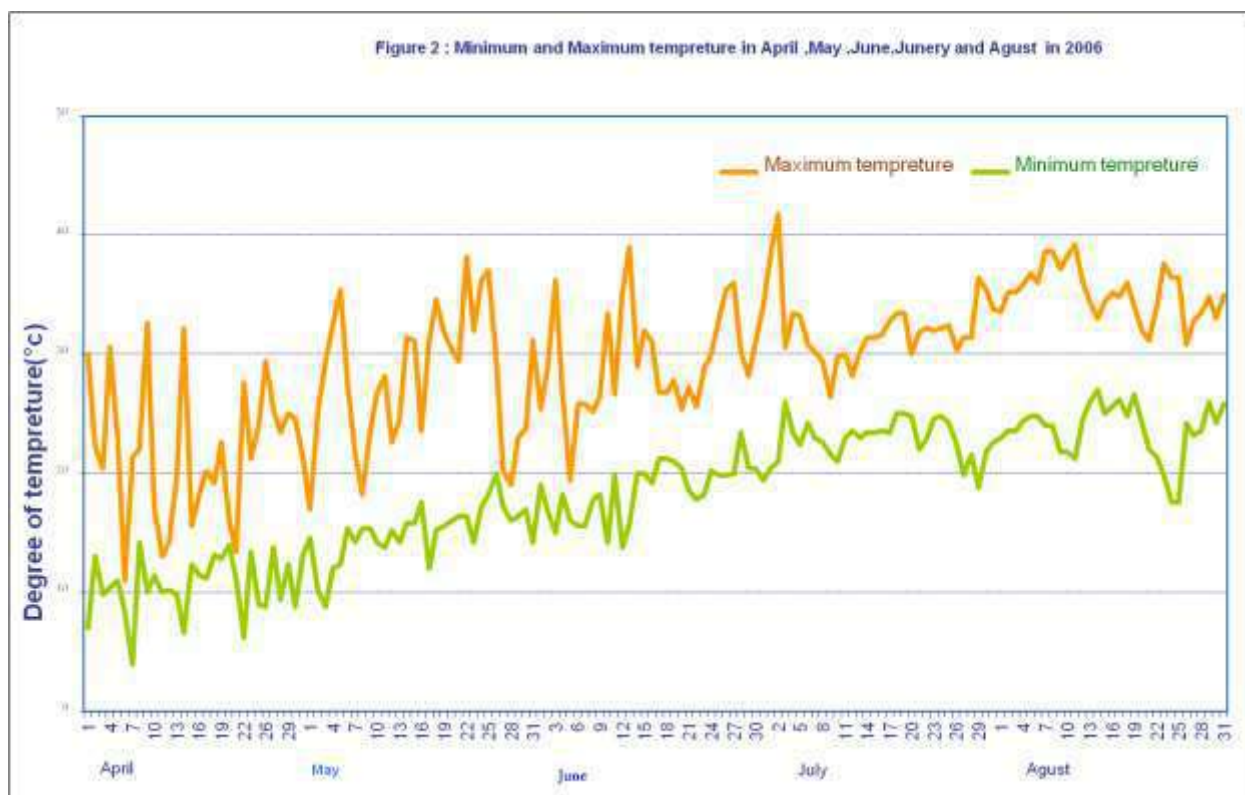
Fig. 2:2006

The experiment was laid out in a randomized complete block design and replicated three times. The experiment consisted of following treatments:

P1=single row, P2=parallel double row with 15 cm space and P3=zigzag double row with 15cm space apart, and plant density consisted of 4 levels; D1=75000 plant ha-1, D2=85000 plant ha-1, 95000 plant ha-1 and 105000 plant ha-1. The inter row spacing was fixed at 60 cm while within row spacing was adjusted according to plant densities and planting arrangement. Each treatment combination was replicated in four blocks using a randomized complete block design. Each plot comprised of four raised beds of 6 meters length –and plants were harvested at the dough-milking stage.

Sufficient numbers of plants were sown for each treatment to facilitate destructive sampling for determining quality parameters. The field was previously under wheat which was harvested on 15 June of 2015. The land was plowed to a depth of 20-25 cm followed by harrowing before planting. Data were analyzed using the analysis of variance (ANOVA) procedure with of SAS (2004) by means between the treatments were compared using Duncan Multiple Range Test at P<0.05.

RESULTS AND DISCUSSION

The results of comparing agronomic parameters of faba at four plant densities **[Tables 2 & 4]**showed, that most of the corn characters including total dry weight, total dry pod, stem dry weight, leaf dry weight, chaff dry weight, stem diameter, pod height and plant height were significantly different (P<0.05) between plant densities. Generally yield and yield components parameters increased with increasing in plant density. The highest total dry weight and pod dry weight were 10.42 ton ha-1and 3.66 ton ha-1 respectively at the plant density of 75000 plant ha-1. In contrast the great grain/pod ratio and harvest index parameters with amounts of 76.54 and 29.57% respectively got from low plant density (45000 plant ha-1).

As shown at **tables 3 & 4**, planting arrangement did not significantly affect the yield parameters except for harvest index, ear height, grain/ear ratio, stem diameter and chaff fresh weight which were 9.5, 9.8, 9.7, 9.7 and 10.0 % greater in the double row compared to the single row pattern and plant height which was 6.1% smaller in the double compared to the single row pattern **[Tables -2&5]**.

Interaction of planting pattern and plant density become significant at most pod studied characters. Combination treatment of planting patterns and plant density showed: high plant density (75000 plant ha-1) by double row

pattern produced the most pod dry weight (3.99 ton ha-1) and total dry weight (10.85 ton ha-1). While the maximum harvest index (27.82%) obtained from low plant density (75000 plant ha-1) with 15 centimeter double row planting pattern. Other parameters such as stem diameter, grain/pod ratio chaff dry weight and chaff fresh weight were the best at low plant density **[Table- 4]**, it means at minimum and medium plant density specially on one double - row pattern, the bushes can grown better and produce a good pod [5,6,7].

Increasing the yield at high plant density due to double row pattern, may is because of closing to square planting arrangement. The yield at low plant density due to lacking number of plant per surface and at high plant density because of competition for absorption growth elements and interference of male and females flowers become limited [8,9,10].

The results showed the highest stem biomass obtained on double row - 95000 plant density treatments. With study this character and in base of that after harvesting pod in doughing - milking stage (for proper conserve or …) rest of green shrub used as forage, selecting density of 95000 or 105000 plant ha-1 should be done. Although pod marketing obviously decreased not only for fresh consumption in despite of significant increase of faba weight in 95000 plant per hectare was recommended for better marketing fababean with double row planting arrangement.

Table 1: ANOVA on fresh yield and some agronomic characteristics of Faba Bean as affected by Planting arrangement

S.O.V.	df	Mean square (MS)						
		Number of plants per plot	Fresh forage yield	Internodes distance	Number of nodes	Number of pod filling	Number of empty pod	Height to node
Reap	2	10.667	813	0.03097	9.14815	96.056	7.056	0.04255
Planting arrangement	2	6464.667**	1439124**	22.83847**	546.81481**	4936.222**	1243.722**	11.33671**
Error	34	17.961	4455	0.01852	0.7702	12.546	1.507	0.01671
CV(%)	-	22.85	32.18	30.67	24.77	32.33	26.96	27.46

**, * and ns are significant at 0.01, 0.05 level and non significant, respectively

Table2. Mean comparison of dry yield and some agronomic characteristics of Faba Bean at deferent Planting arrangement.

Treatment	Number of plants per plot	Fresh forage yield(kg ha-1)	Internodes distance (cm)	Number of nodes	Number of pod filling	Number of empty pod	Height to node (cm)
			Planting arrangement				
P1	54.2222c	509.2778c	2.07500c	10.6667c	63.5556a	20.2222c	1.90000c
P2	67.2222b	588.6667b	3.18889b	15.0000b	47.6667b	27.9444b	2.64167b
P3	91.5556a	6374.7778a	4.32778a	18.4444a	30.4444c	36.8333a	3.48611a

P1=single row, P2=parallel double row with 15 cm space and P3=zigzag double row with 15cm space.

Table 3. Mean comparison of dry yield and some agronomic characteristics of Faba Bean at deferent planting pattern.

Treats/ Treatment	Chaff dry weight (Tonh⁻¹)	Pod dry weight (Tonh⁻¹)	Kernel dry weight (Tonh⁻¹)	Stem dry weight (Tonh⁻¹)	Leaf dry weight (Tonh⁻¹)	Total dry weight (Tonh⁻¹)	Harvest index	Pod height (cm)	Grain/ pod ratio	Stem diameter	Kernel fresh weight (kgh⁻¹)	Chaff fresh weight (kgh⁻¹)
Planting pattern												
Single row	0.617 a	2.488 a	1.371 a	4.706 a	2.377 a	5.53 a	24.28 b	78.1 ab	53.40 ab	19.23 b	3432a	3284 a
Parallel double row	0.580 ab	2.949 ab	1.0 74 ab	5.469 ab	2.791 a	6.44 a	25.60 ab	71.88 c	56.85 a	20.5 ab	3210a	2985.4b
Zigzag double row	0.790 a	3.949 a	1.884 a	6.559 a	2.991 a	6.88 a	28.70 a	81.68 b	66.85 a	22. 2 a	3550a	3385.4b
LSD (%)	0.116	1.42	0.770	1.584	1.008	4.427	1.310	3.646	4.76	0.6336	82.19	621.6

Means within columns followed by same letters are not significantly different at 5% level
P= Planting pattern; P1= Single row, P2= Parallel double row, P2= Zigzag double row

CONCLUSION

Overall findings showed that: with considering double row planting arrangement, would be increase 11.7% without negative effect on dry yield and dry component of Faba Bean and these treats could be increase 9.5%. The highest leaf dry weight (3.99 ton ha-1) and total dry weight (10.85 ton ha-1) were produced by 95000 plant ha-1 plant density and 15 centimeter double row. In contrast the highest harvest index (27.82%) was related to low plant density (75000 plant ha-1) with 15 centimeter double row planting pattern. Double row planting pattern may be recommended as a suitable farming method in northern Iran due to the benefits associated with increasing number of plant per surface unit and decreasing inter plant competition.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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FINANCIAL DISCLOSURE
None

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ARTICLE **OPEN ACCESS**

SIMULATION OF PIEZO RESISTOR GAS PRESSURE SENSOR FOR EFFECT OF SHAKE OF THE AFM PROBE USING THE COMSOL SOFTWARE

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ABSTRACT

The amount of pressure on the surface perpendicular done using mechanical methods For measuring the force applied to the outer surface of reservoirs or pipes containing gas because the pressure exerted on all the walls and different levels, Is inefficient. In order to measure this kind of pressure, extensive studies have been conducted over the past decades and various methods have been proposed that some of the errors were associated advantages and disadvantages. In this study, the following issues raised by the use of piezoelectric structure, the design and simulation as a barometer Pisoresistor structure and to optimize its output linear displacement effects have been addressed probe. The results showed that apart from the physical parameters such as pressure screen dimensions, the County Laver, shape and dimensions of He, and made each of them a major role in the resistance again linearity of the output voltage to the probe.

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INTRODUCTION

This paper discusses the design and simulation of piezo-resistor barometer in order to measure displacement of Afm probe. It is worth noting that all the obtained results of this paper which are studied and simulated in different voltage-ohmic frames and obtained from this structure are merely due to pressure on this structure and displacement of Afm probe. Displacement of the aperture is measured by changing the inductance (Hall effect). Induction pressure sensor has two coils that are coupled with a magnetic core. When the applied pressure moves the aperture, it moves the core. Induction feature is measured by electronic circuits such as resonance circuits.

Demand for low cost and small size of semiconductor pressure sensor has been increasing by technology development in various fields of engineering, including precision measurement, control and biomedical systems. Transferring from mechanical to the silicon type is the solution for this demand. Micro-sensors are widely used in today's devices and micro-pressure sensors are one of the most common Mems devices and have gained popularity in biomedical, aerospace and automotive industries. Such a sensor usually consists of a silicone membrane and four resistors located on the edges of the membrane along the crystal (110). When a pressure is applied to one side of the aperture, it bends and tension is appeared in the whole structure. Changes in stress represents a change in electrical resistance of piezo. To optimize voltage sensitivity of such a piezo-resistive sensor, Wheatstone bridge configuration is done using piezo resistors [1]. This paper aims to identify the properties of these micro-structures and simulate a new proposed structure to advance practical purposes. It should be added that simulation of this sensor is performed by powerful simulation software of COMSOL. The piezoelectric effect is used in certain materials, like quartz to measure the tensile due to stress. This technology is used to measure dynamic pressures. A variety of crystals called piezoelectric produce an electrical signal due to mechanical deformation. Voltage level of this signal is proportional to the deformation value.

Crystal is attached to a metal aperture. One side of the aperture is used for measuring pressure in contact with the process fluid and the other side of the aperture is mechanically connected to the crystal. Crystal's output voltage

signal has a small amplitude (in mV range). Its operating modes are contact mode, non-contact mode and intermittent contact mode [2].

MATERIALS AND METHODS

In this section, first the structure and different parts and their relationships are investigated. Then, the nature and the need for mesh configuration have been raised.

The simulated structure consists of three part. The first part is the pressure-employing disk. In fact, pressure employed on the structure imports most of its power to this point. This part should be hard and dry to be able to convey the overall pressure. This part is positioned at the beginning of the second part [3].

The second part is the Cantilever with spiral-shaped structure and can start vibration once the pressure is employed. Cantilever, which is the connection between the first and third parts, conveys the vibration on itself to the third part causes important changes in electrical parameters such as frequency, voltage and the ohmic value of the structure. All this changes are appeared in maximum values in third part of the structure. In other words, all changes in Cantilever reach the greatest amount in third part.
Third part of the probe is Afm. This probe may have various sizes and shapes. Two aspects are of great importance in its design. First, it should be smaller than pressure-employing disk in order to convey all changes. Second, it should be hard and dry so as to convey Cantilever vibrations appropriately and avoid of damping nothing within itself.

RESULTS

All the mathematical relationships are related to mechanical and electrical modes [4-6]

Voltage Equation
$V=abs(Rl\_v)$
Mechanical Power Equation
$0.5*intop1(realdot(solid.rho*g\_const*acc,solid.u\_tY))*w\_plate$

Electrical Power Equation
$0.5*realdot(cir.R1\_i,cir.R1\_v)$
The reason why the structure is designed as shown in **Figure- 1** is that the Cantilever can easily moves toward different frequencies by employing various pressures.
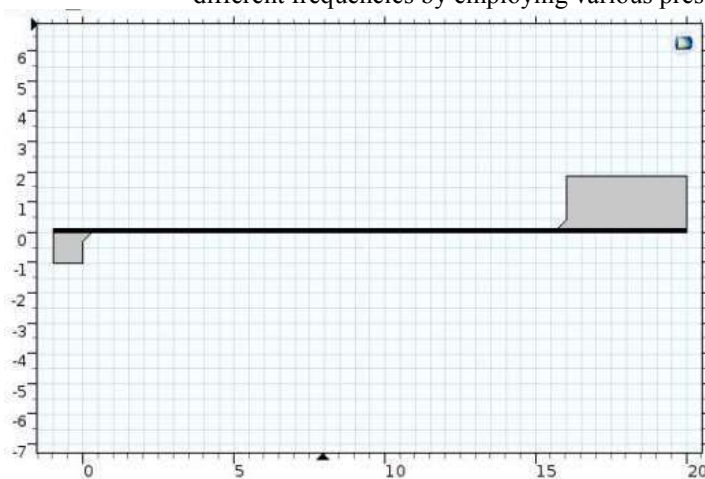
Fig: 1. simulation structure

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As seen in **Figure- 2,** the best performance obtained is in the frequency of 75.5 Hz. Thus, to get appropriate output, it is required to employ frequency of 75.5 Hz to the structure called frequency response curve. This is shown in **Figure- 3and 4**.
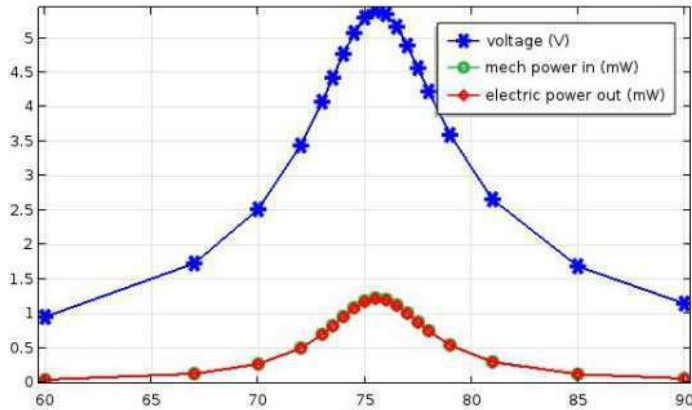
Fig: 2. Frequency response

In the next step, the created changes of pressure is adressed properly and with higher quality which cause variotions in voltage, mechnical pressure, and electrical pressure in frequency of 75.5 Hz.

Thus, it can be stated that simulations and ohmic value measurement and its placement in Wheatstone bridge and Afm measurement probes (12 possible modes) are done by employing pressure on piezo-resistor structure which leads to find optimal point of performance.

One of the important parameters in this paper is to investigate pressure variation, resulting in variations in voltage, mechanical pressure and electrical pressure.
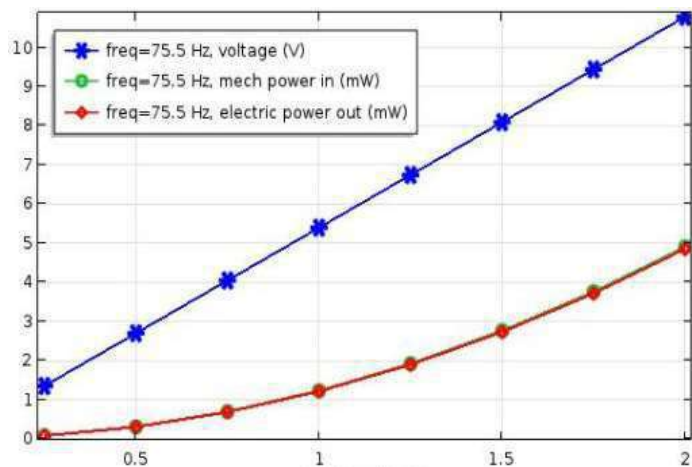
Fig:3. Pressure structure

The employed pressure on the structure is addressed in **Figure- 3.** The pressure employed on the structure not only causes initial acceleration on sesnsor plate, but also leads to oscillations in the Cantilever. This, in turn, results directly and practically in Afm probe displacement. In tjis figure, the reason why accelartaion is evaluated is that the pressure employed on the structure on vertical axis leads to initial acceleration. Blue, red and green lines depicted in the fisgure denote voltage in V, output electrical power in mW, and mechanical power employed in mW, respectively. It should be mentioned that two electrical and mechanical power curves are overlapped when transformation value is 1.

Another important parameter evaluated was 1 kΩ's load resistor which had linear growth in lower pressures; however, it was not the case in higher pressures **[Figure- 4]**. Despite the fact that this increase is of exponential type, it is continuous and permanent. Thus, 10 kΩ's load resistor is the appropriate load resistor. In order to ensure appropriate operating point, i.e. selection of 1 kΩ's load resistor, the output of the structure is also given for 100 kΩ's load resistor. As it is clear from its figure, this resistor provides no appropriate and linear performance for the system.
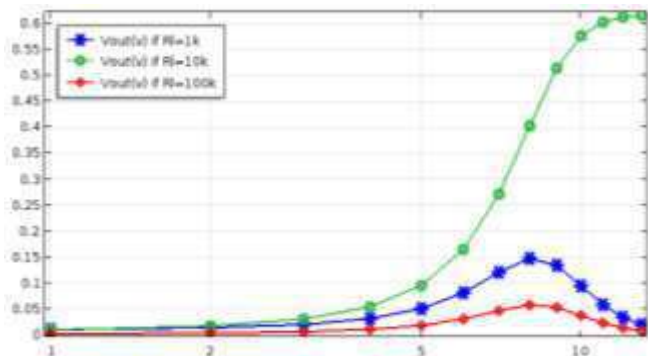
Fig: 4. Load resistor

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As seen in [**Figure- 4]**, the output value is in V. this voltage is due to employing pressure on pressure sensor region which caused displacement of Afm proble and changed the values.

CONCLUSION

Since piezos have more appropriate performance in alternative currents, it is recommended to operate them in alternative voltages.

Voltage changes in piezo structures are low. Thus, it is required to use amplifiers. These changes occur in different directions such as measurement of pressure, vibration, tempreature, and audio production, etc. Ohmic changes of piezos have non-uniform Impednace matching in various load conditions. That is, for example, a structure with load resistor of K 2.2 has better performance than its k 22 counterpart. This structure with a resistor of k220 supplies no proper output. Therefore, finding exact load resistor is of paramount importance in detecting ohmic variations of piezo structure.

Finding the best frequency is another important parameters in piezo structures, Because the performance of piezo structures is different in various freqncies.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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FINANCIAL DISCLOSURE
None

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SURVEYING THE EFFECT OF METAL CROSS BRACE IN CONCRETE STRUCTURES

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ABSTRACT

Studying past earthquakes in Iran have shown that many of the reinforced concrete buildings do not have enough resistance against earthquakes. There are various methods to strengthen reinforced concrete structures such as shear walls and metal cross brace, the cover sheet, post-tension and infills, among which using metal cross brace is more common and sometimes shear frame is used along with shear wall and metal cross brace. By increasing the area of the harness cross brace, shear force is reduced by the frame and after a certain extent, it does not have a special role in absorbing earthquake shear force, then it is necessary to examine the structural behavior. Brace and frame behavior was similar in the lower classes and absorbing the earthquake shear by each one in the lower and middle classes is roughly equal. In order to study the combinational behavior of metal cross brace and the effects of cross brace area on the behavior of reinforced concrete structures and the percentage of shear absorbed and lateral displacement of the structure, here a ten-storey reinforced concrete structure in 4 stages will be analyzed. In stage one, only the shear frame, in the second stage, frame and shear wall and in the second stage, frame along with shear wall and metal cross brace will be explored. Building structure and stability depends on its structures and constructions. Construct or any building or structure has two important tasks to undertake. The first task is that the structure can have aptly stability in different environmental conditions such as cold, heat, wind, storm or flood and earthquake and if it is the peoples' accommodations or equipment, it should provide safety of life and property of its citizens. The second task of the structure is that it should be coordinated with the functional concepts and aesthetic requirements of architecture and coordinate of our environment and have inherent flexibility and consistency while having violence and inherent strength.

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INTRODUCTION

In stage one, only the shear frame, in the second stage, frame and shear wall and in the second stage, frame along with shear wall and metal cross brace will be explored.

For the parametric study, reinforced concrete structure with 5 spans 4 meters in X direction and four 3-meter span is in Y direction have been selected. Residential use of floor dead load of 650 kg / m2, load volume of 150 kg / m2 live load floors and roof of 200 kg / m2 are considered. Putting cross brace and shear wall in the X direction on axis 1 and 5 is ok in terms of architecture. The place of shear wall and cross brace have also been specified in **[Figure-1]**. Compressive strength of concrete (cylindrical sample) is considered f"c = 2800 kg / cm2. Major metal yield stress fy = 3000 kg / cm2 and stirrups fy = 2400 kg / cm2 have been considered. Floor height is 3 meters. Lateral load system in X direction (East - West), complex system of space shear frame, cross brace and shear wall and in Y direction (North-South) is only space frame. To load, 519 and 2800 Iranian Regulation and for the design of reinforced concrete, ACI Regulations and for metal members, AISC Regulation were used. To calculate the earthquake load, semi-static method of Regulation 2800 has been used. Ceilings are assumed to be rigid. Earthquake force is applied to the structure only in the X direction and according to the second compound (1.87 E) 0.75. The analysis is done in four stages. In the first stage of analysis, three-dimensional frames is influenced under vertical loads and 25%seismic forces. Here, the frame members should tolerate an increase in the vertical load, 25% of earthquake force, recommended according to Procedures 2800 (structural F25). Also, at this stage, reinforced concrete frames is influenced under vertical load and 100% of that earthquake force **[Figure- 3** Structures FWI). The purpose of this two-step analysis is that dimensions of walls and beams and columns are determined in such a way that frame can tolerate 25% of earthquakes force and walls 75% earthquake force in order that the design is economic and optimal.

In the third stage, frames is analyzed with shear walls and metal cross brace under the vertical load and 100% of seismic force and the interaction of shear walls and metal cross brace has been studied on reinforced concrete frame **[Figure- 4]**Structures FWBI). In the fourth stage of analysis, the frame with cross cross brace without shear wall is influenced under the vertical load and 100% of the earthquake force. The area of the required cross brace to strengthen the existing reinforced concrete structure has been determined. **[Figure-5]**- Structure FBI).

1. Article

In the structure, F is reinforced frame structures, W is shear wall and B metal cross brace.

First level:

After analyzing the structures, lateral displacement curves in various storeys for the analysis stage has been shown in **[Figure -6]**. In the first phase, three-dimensional frames was influenced under vertical load and 25% earthquake force. As can be seen in [**Figure- 6**\, the frame has been displaced in shear mode in F25 structure. The maximum displacement is on the tenth floor of 6.23 mm. The amount of displacement and cutting absorbed by the mold for this purpose are calculated as the quantity of cross brace and shear walls causing the frame to withstand only 25% of the earthquake is achieved. The dimensions of the columns and beams at this stage is used at a later stage as the criteria. In this process, the frame is influenced under vertical load and the total earthquake load (structural F100). According to **[Figure- 6]**, reinforced concrete frame has been deformed as shear and lateral displacement on the tenth floor is 94 mm, which is about four times with F25 structures.

Second level:

At this stage, the frame with four different shear wall is analyzed in various states under vertical load and 100 earthquake force and the following cases are discussed. **[Figure- 7]**shows the effects of wall thickness shear effect on the cutting rate absorbed by the frame. By absorbed cutting rate, the ratio of the shear frame tolerated by columns or cross brace in each category to total cutting on each floor. First, it was tried that absorbing earthquake force by the frames is as much as 25%. If the thickness of the walls is very low (in all classes 7 cm - Structure FW2), although the frame destroys 25%earthquake force down on the floor, force attraction by the frame increases in other storeys and structure displacement will also be very high. In order that structure displacement in the second stage becomes similar with frame displacement only under 25% earthquake force (F25), it is necessary that the thickness of the walls at 80 cm 10 cm in both floors is reduced, respectively, and reach 40 cm on the tenth floor which these thicknesses are not executable (FW3). In this case, although the absorption of the earthquake by frame in the floors is about 25%, the force absorption in the first floor by the frame is about 5% **[Figure-7]**If the thickness of the walls to be considered reasonably and administratively (FW1), that is, 20 cm at the bottom of the wall thickness and reaches 2.5 cm in both floors, as can be seen from **[Figure- 7]**, the structure shows a more balanced behavior. Since this state is considered as criterion, it is discussed below:
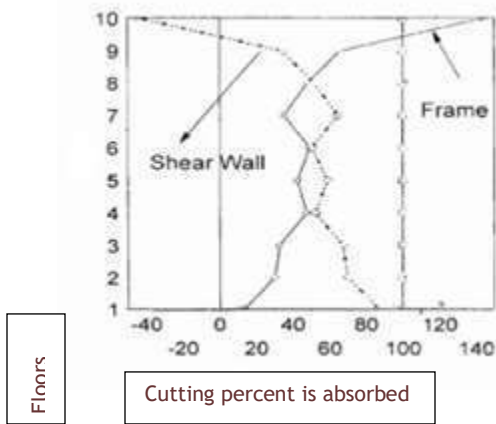
Fig:1. linteraction frame - double shear (structural fw1)

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[Figure- 8]shows frame and shear wall interaction in structures (fw1). As seen in this figure, the frame determines 13.3% in the lower part and shear wall absorbs 86.7% of earthquake force. Force absorption by the frame in the second to 9th floor varies between 30 and 65%. Due to the interaction of the frame and the wall, the wall has a bending behavior; in the upper parts, the frame helps the wall and as seen, force absorption by the wall is 45%. That means that not only the wall does not absorb earthquake, but also produces a force in the direction of earthquakes force. For this reason, the frame on the second floor absorbs about 5.14 percent of earthquake force, which is not very good. To address this problem, the wall in the upper floors is cut. The following mode was emerged by these analyses (fw4).

Percent cut absorbed by the
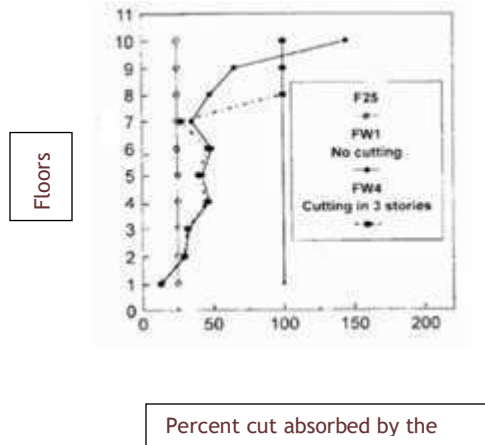
Fig: 2 . The effect of shear walls cut at the top on cutting absorbed by the frame

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[Figure- 9]shows that if the shear walls in the three top floor is interrupted (h * h / h = 0.7, not interrupted floor height of the wall and h total height of the building.) the percentage of earthquakes force absorption by the shear wall will not be negative in any floor and the earthquake in the three upper floors is tolerated by the frame. this method is more economical and no significant difference can be seen in terms of displacement.

Third level:

at this stage, frames with shear walls and metal cross brace influenced under vertical loads and one hundred percent seismic forces and the effect of cross brace and its surface on the behavior of a reinforced concrete building strengthened by two shear walls on each floor is investigated. in this section, instead of two shear walls of second level, two cross cross braces are considered [Figure-4]. in this level, it has been tried that the displacement changing load achieved in the first and second level becomes similar with displacement by relocating the cross brace level and in another state, shear force absorption by the frame in the third and second level becomes similar. the multiple analyzes show that if for all properties, structures fw1 is used only for cross cross brace, first and second floors with an area of 48 square centimeters, channel 16 with an area of 48 cm2 and in the third and fourth classes, two channel 14 with an area of 41 cm2 and in the fifth and sixth channel, two channel 12 with an area of 34 cm2 and in the 7th and 8th floors, two channels with an area of 27 cm2 and at the ninth and tenth floors, two 10channels with an area of 27 cm2 were used. relocation of the second and third levels becomes similar (structures fw1, fwb1). [Figure- 7] indicates this issue. as
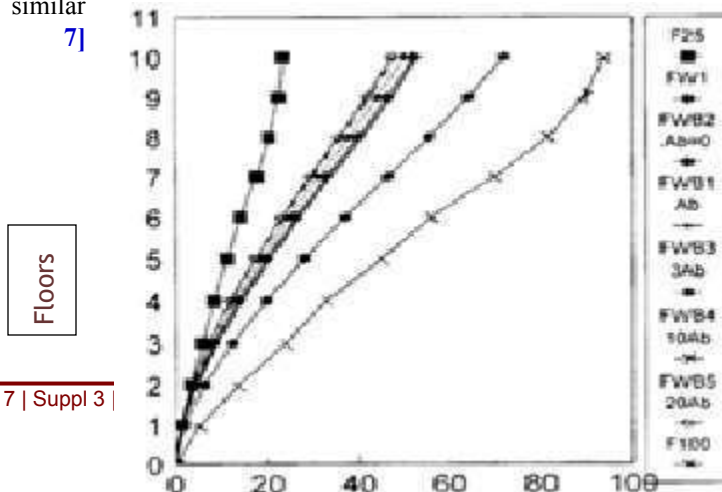
Lateral displacement

Fig:3. Area bracing effect on the lateral displacement (stage iii)

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can be seen in [**Figure -10**], even if the area cross brace are 10 times (structural fwb4) displacement of structure at this stage cannot be equal with the first stage (25% of earthquake force and covers only, the structural f25). thus, it can be concluded that if in a reinforced concrete structure, the lateral displacement exceeds the allowed limit in order that a certain amount of cross brace area can be influenced and then it will not have a specific effect on structure's behavior. also, if a cross brace is not used (structure fwb2) lateral displacement significantly increased.
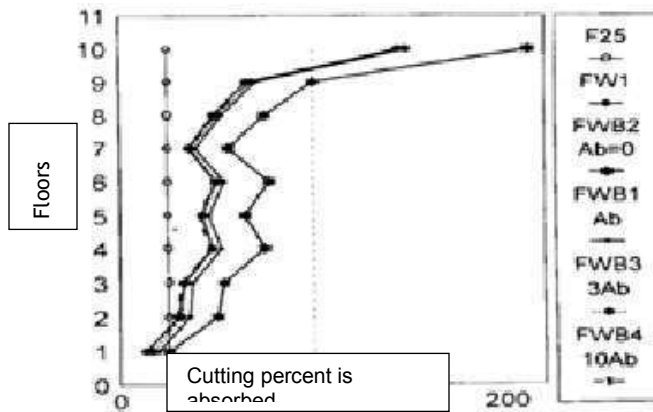
Fig: 4. The effect on the absorption area braces for earthquake

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[**Figure- 11**]shows the absorption method of earthquakes force by the frame for the first, second and third levels of analysis as well as the effects of cross brace on structure's behavior. if the area of the cross brace is selected 3 times higher than the above mentioned, absorption percentage in the two structural frame fw1, fwb3 becomes similar, however, fwb1 structure presents an almost similar curve with fw1 structure. so finally fwb1 structures at this stage will be used as the criterion. according to the results, optimum surface for cross brace for designation is suggested. if the cross brace are removed from the system (e.g., fw2 frame structure and two shear walls) absorption cutting earthquake increases so that in the last floor, cutting absorption by the frame reaches 200%; in other words, shear walls have negative effects and lean on the frame. by increasing the cross brace area, cutting absorption by frame is reduced especially on the top floor. it can be claimed that the negative effect of shear walls is   reduced   from 200% to 150%.
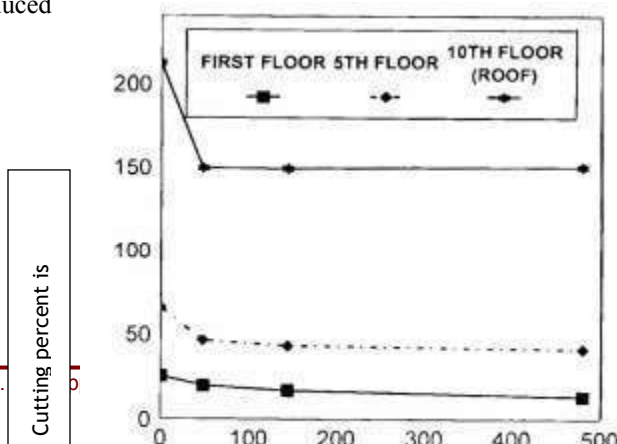
Area braces
(cm²)

Fig:5. The impact on the absorption area braces for earthquake by frame (the third stage of analysis)

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[Figure- 12]specifies changes of earthquake cutting absorption by frame than the area cross brace. as can be seen, cutting absorption by the frame is reduced by increasing the cross brace area from a certain limit (about 50 cm), cross brace do not have a special role in absorbing earthquake cutting; in other words, not every type of reinforced building concrete can be strengthened by metal cross brace. to determine the exact extent, different buildings with different height spans should be analyzed and eval

Cutting percent is
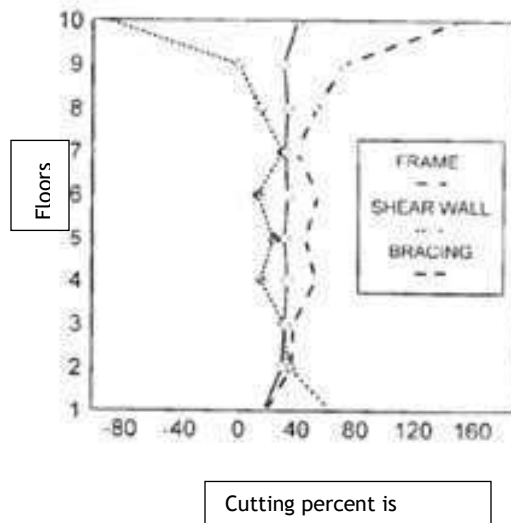
Fig:6. Interaction frame, shear wall and bracing (structures fwb1)

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[Figure- 13]shows the interaction between frames, shear walls and metal cross brace in the structure fwb1. it can be observed from this figure that the behavior of the cross brace and the frame at the bottom is similar to each other. the frame is experienced a very high cutting at the top, while the cross brace has a similar behavior at the top and bottom. despite the cross brace, earthquake absorption by the wall is reduced, but cross brace absorbs the force at the last floor and on the other hand, negative wall cutting increases.

in fw1structure, cutting absorption above is done by the wall 44% and while fwb1 structure has been considered 84%. this figure also shows that the wall cutting in the top floors does effect on the earthquake absorption by frame; however, it increases negative cutting of the wall.
fourth level:

in this level, the frame along with metal cross brace without shear wall under the influence of vertical load and one hundred percentage of earthquake force has been analyzed. in the structure's model, all shear walls have been removed and instead metal cross brace was used. thus, the effect of cross brace on the behavior of a bending space frame of reinforced concrete will be examined. for the lateral displacements of structures in the second phase (frame with shear wall without braces) and the fourth phase (frame with cross brace without shear walls) becomes

similar, the cross braces in fwb1 structures was used (structural fb1). in this state, absorbing earthquake force by frame on the first floor is about 40%.
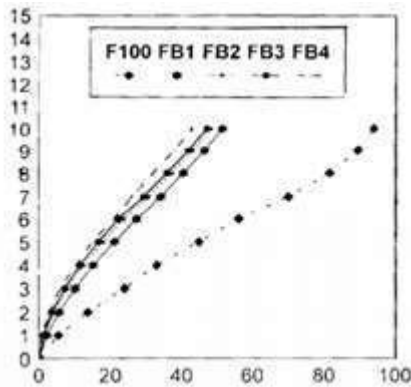
Floors | Shift Accessories
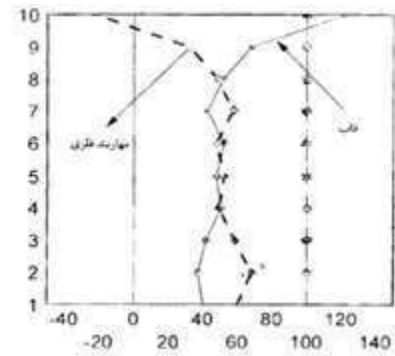
Floors | Cutting percent is

Fig:7. Area bracing effect on the lateral displacement (stage iv) bracing and reinforced concrete frames (structuresfb1)

Fig: 158.percent cut absorbed by

fb1 structure displacement in the roof floor is 4/51 mm, which about half the roof floor structures of reinforced concrete frame is without brace **[Figure- 14]**. in other words, comparing two systems of bending frame with and without cross brace shows that using metal cross brace reduces structure displacement almost 50% and increases structure stiffness as much as two times. deformation of reinforced concrete frame strengthened with cross brace is by a combination of bending and shear mode. **[Figure- 15]**shows the percentage of cutting absorbed by the cross brace and reinforced concrete frame in various floors for fb1 structure. due to the different behavior of reinforced concrete and metal bracing, an interaction occurs between the frame and the brace. down on the floor, cutting absorption is about 40% and by cross brace is about 60%. due to the different behavior of the frame and cross brace in the upper floor, force absorption by the cross brace above is negative; that is to say, not only cross brace absorbs absorb earthquake force, but it generates additional power which the frame should tolerate it. in other words, cross brace does not continue only in the upper floors, the cross brace behavior and the frame in the middle and lower floors are almost the same and the absorption of earthquake cutting by each is equal.
the effect of cross braces area;

after examining the effect of bracing in reinforced concrete frame, in this case, the area of cross braces has been increased and lateral displacement of the structure and the amount of cutting absorbed by the frame brace have been investigated in the fourth stage.

after examining the effect of bracing in reinforced concrete frame, in this case, it increases the area of braces and the lateral displacement of the structure and cutting absorbed by the frame braces have been investigated in the fourth stage. as previously described in the fb1 structure, absorbing earthquake force by the frame in the first floor is about 40%. for the earthquake force absorption by frame on the first floor reach about 25%, the braces area to fb1structure increase 2.5 times (structure fb2). if the area braces increases 5 times compared to fb1 structure, earthquake force absorption by the frame on the first floor reaches 16% (fb3). in fb4 structure, braces area to the structure fb1 has been exaggeratedly 1000 times. in **[Figure -14],** lateral displacement of structures f100, fb1, fb3, fb4 can be seen in different floors. by increasing the braces area, reducing the lateral displacement is not significant. for example, comparing the two structures fb1, fb4 shows that the lateral displacement on the tenth floor decrease from 51.4 mm in fb1structure to 43 mm in fb4 structure (about 16%). it was also concluded that if an existing reinforced concrete structures exceed lateral displacement from a certain amount, a certain amount of

cross brace area can be influenced and after this certain limit, it will have little effect on the structure and if a cross brace does not use (structure f100), displacement significantly increases.

Cutting percent is
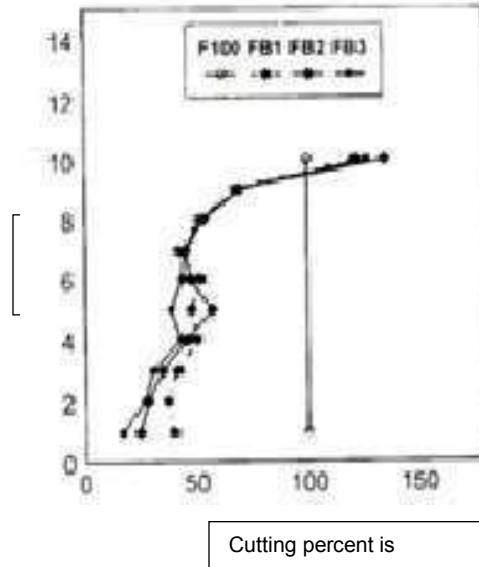
Fig: 9. Area braces absorbed by the frame effect on percent cut

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[Figure-16] shows earthquake force absorption by the frame for different values of the cross brace area. according to the derived areas in structures fb2, fb3, fb4 that seem not reasonable executively, it could be concluded that the existing of reinforced concrete structures are better strengthened by shear wall or a combination of shear wall and cross brace. the use of metal braces alone in reinforced concrete structures causes large forces in the frame members (beams and columns) are emerged. in this case, it is necessary to strengthen the members and the foundation which are not affordable economically and has its own problems in terms of implementing as well.
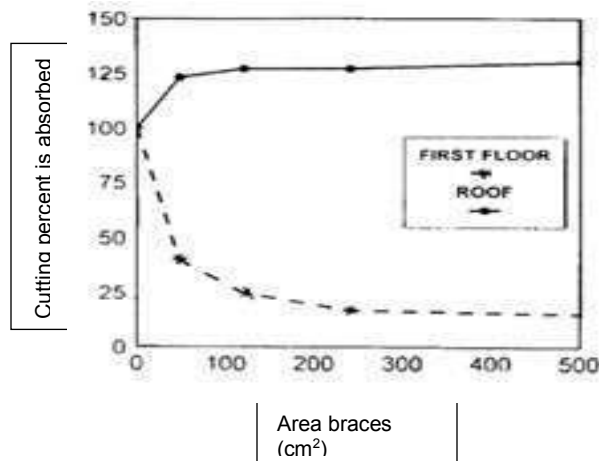
Area braces (cm^2)

Fig: 10. Area braces absorbed by the frame effect on percent cut

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in **[Figure -17]**, the effect of braces area on the cutting percentage absorbed by the frame in the first floor and roof can be seen. on the first floor (dashed curve), shear amount is reduced by the bearing frame with the increase of braces, i.e. the braces in the lower floors help frame and at a certain point onwards, existing cross brace has not much effect on tolerating earthquake cutting. at the roof floor (solid curve), cross brace behavior is reverse. in other words, by increasing the cross brace area, the percentage of absorbed cutting by the frame increases and is more than one hundred percent. according to this conclusion, existing cross brace in the upper floors is not only not helpful, but should be discontinued. the maximum article pages that include text and all its components, including figures and tables, is 8 pages.

CONCLUSION

Using cross braces to strengthen the existing reinforced concrete buildings with shear walls shows that cross brace behavior and frames in the lower floors are similar to each other and in upper floors, earthquake shear force is largely tolerated by frame. It can be observed from the results that cross brace almost constantly tolerates earthquake cutting in the height, while shear wall at the bottom are working well and has a negative effect on the upper floors. Cross brace helps strengthening the structure to a certain extent and determining the optimal amount for braces area needs further research and different structures with different heights and openings should be analyzed and studied. The results showed that in FB1 structure, the lower floor of cutting absorption by the frame and cross brace, upper floors due to the different behavior of the frame and brace and force absorption by the cross brace above is negative, i.e., not only it does not attract earthquake force, but it generates an additional force that the frame should tolerates it. To solve this problem, it is recommended that cross braces do not continue in upper floors. By increasing the cross brace area, the cutting absorption in the lower floors decreases; but in upper classes, cutting absorption is done by the frame. Brace and frame behavior was similar in the lower classes and the lower floors and earthquake cutting absorption by each one in lower and middle classes is almost equal. Comparing two systems of bending frame and metal cross brace reduces lateral displacement of the structure to about 50 percent.

3. Relations, figures and tables

3.2 Figures and Tables
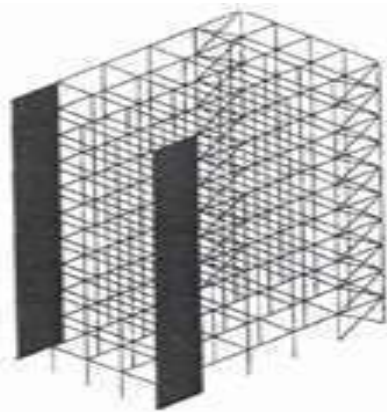
Fig: 11 . third stage analysis - frame shear walls and steel bracings under the force of the earthquake(fwb1)
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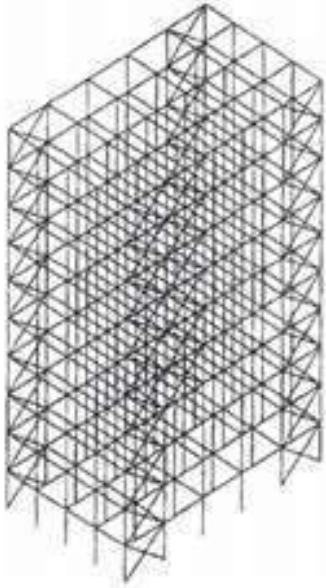
Fig:12. The third stage frame analysis and bracing

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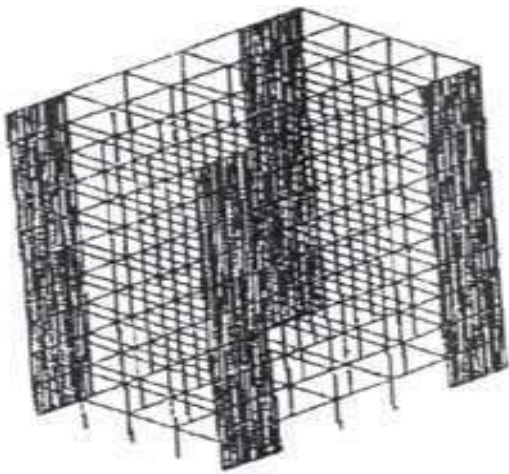
Fig: 13-the second stage analysis of frame and shear walls(fw1)

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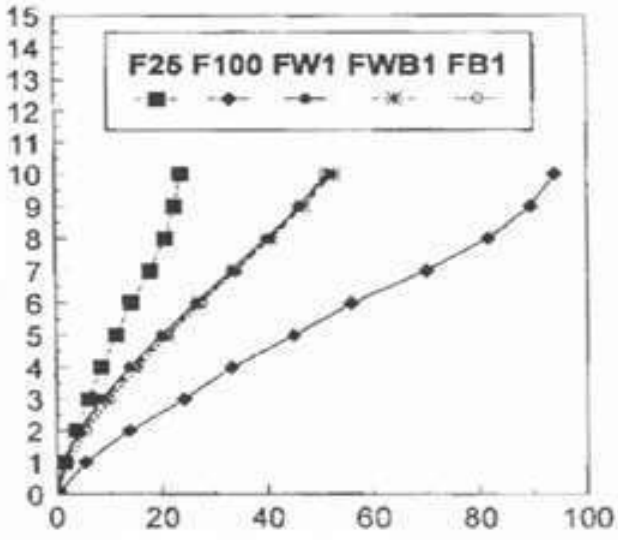
Fig: 14. Wall thickness shear effect on the absorption earthquake cut by frame

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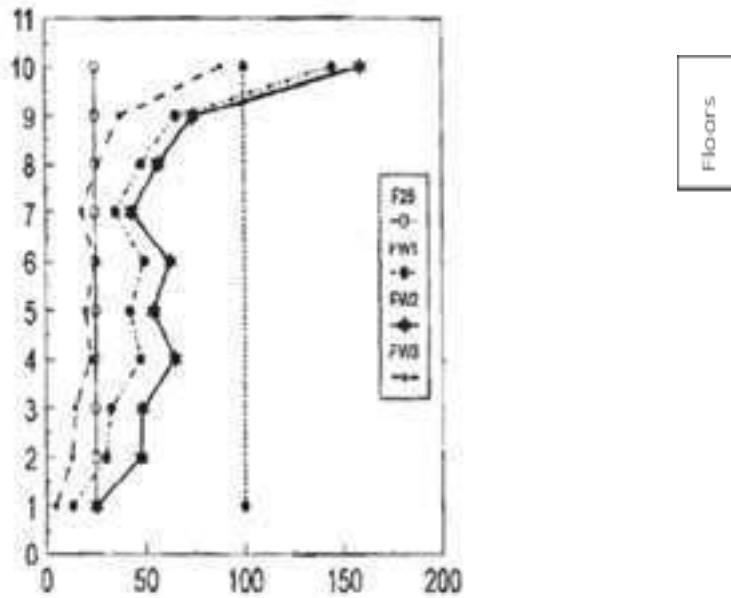
Fig: 15. Change lateral structure in the various classes for four Analytics

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THE EFFECT OF CLIMATE ON IMPROVEMENT OF DAMAGED HOUSING ARCHITECTURE IN SUSTAINABLE URBAN DEVELOPMENT (CASE STUDY: NEIGHBORHOOD SRDRGAN IRANSHAHR)

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ABSTRACT

Urban deterioration is a sign of physical and socioeconomic conditions which have occurred as a result of long-term neglect of buildings, infrastructures, and passages deprived of appropriate situations for living. The present article is intended to examine and evaluate the role of rehabilitation of deteriorated textures at SardarganIranshahr Locality, Iran, in sustainable development. Our methodology is developmental-practical together with typological and analytical methods used as appropriate. Analysis of this research is carried out in two descriptive and inferential levels. In descriptive statistics level, statistical indices such as frequency and percentage are applied. In analysis level, on the other hand, inferences are made in accordance with available data, suppositions, and software SPSS and GIS. According to conducted analyses, this is concluded that a type of intervention in which functionalist and culture-oriented methods are combined is the most suitable approach to reach at sustainable development. It means that residents are, in a synchronous manner, inclined to complete rehabilitation projects in a combined functionalist and culture-oriented method.

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INTRODUCTION

Old urban regions, which have been spaces responsible to their residents' needs upon their formation, are currently devoid of potent performance as a result of technological, biological, and socioeconomic developments. While they used to be a place of wealth accumulation and powerfulness of cities, these regions are presently experiencing weakened civil services and infrastructures, being unorganized in their physical aspects [1]. Rehabilitation plans, with regard to their broad dimensions, are intended to arrive civil life into a sustainable development. Rehabilitation implies betterment and development of civil dimensions that have been accompanied with this concept right from the scratch. Accordingly, civil rehabilitation has several plans, and its focal objective is urban sustainable organization and development. In delineation of urban sustainable development, elements such as socioeconomic, cultural, and environmental stabilities possess strategic roles. In the meanwhile, this is important to address the urban rehabilitation as an interaction among processes, elements, and instruments engaged in affairs associated with sustainable development and urban management, the contexts which are unavoidable in reaction to defects and inequalities as well as economic, spatial, and environmental inefficiencies [2]. The present study, therefore, was formulated to examine and evaluate the role of rehabilitation of deteriorated textures at SardarganIranshahr Locality, Iran.

Statement of Problem

Rehabilitation is improvement of textures and their internal elements. It includes a body of actions that are adopted respecting physical consistency with primary patterns and maintenance of textures and elements therein. In non-physical aspect, rehabilitation is able to electrify internal life [3]. In urbanization, rehabilitation is concomitant with actions and predictions to better quality of physical and spatial environments. It means that a better spatial environment is achieved if modern facilities are furnished [4] an increase in lifetime[5]. Deterioration implies inefficiency and reduction in effectiveness of a texture as to efficiency of other urban textures. Deterioration of textures and their internal elements is caused by lack of development plans and technical supervisions thereon. Repercussions of texture deterioration, which ultimately lead to an excretion of city's respect by citizens, are

ARCHITECHTURE

emanated in different modes including reduction of safety and environmental conditions as well as physical, socioeconomic, and facility disarrangements [6].

A sustainable development is one which fulfills requirements of the present generation without endangering those of upcoming ones [7].

: 1). Our cities have shown the best types of resistance in the past. In this research, therefore, conditions of constructions and buildings are assessed in both qualitative and quantitative terms. This is to address whether or not cultural and socioeconomic status of residents have had impacts in this regard. This is intended to identify deteriorated textures at SardarganIranshahr Locality, Iran, and determine deterioration indices and role of local rehabilitations in urban sustainable development.
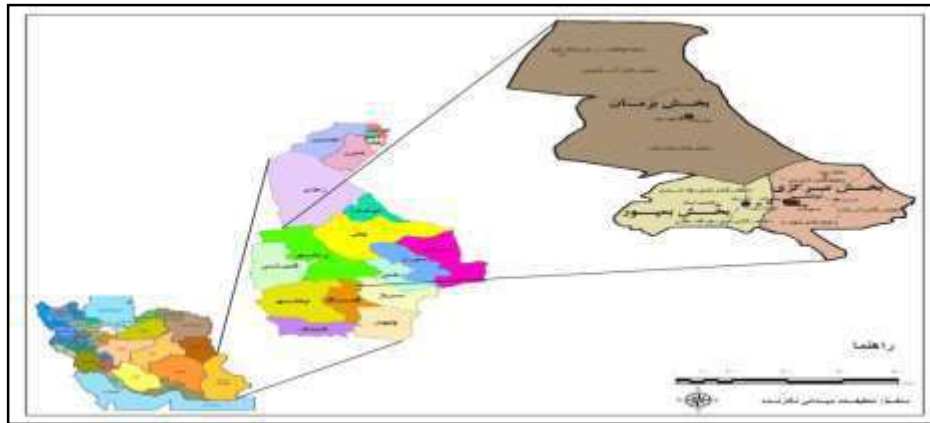
Fig. 1: position of Iranshahr province in political divisions

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Literature Review

The issue of deteriorated textures has had so great significance that it has attracted several research attempts both in Iran and outside. Studies conducted in Iran have not been limited. Subsequent to recent earthquakes in Iran, higher attention is paid to deteriorated textures, and an enormous number of seminars and conferences have been arranged by Municipalities, City Councils, etc. While the frequency of books directly addressing deteriorated textures is slim, the massive number of articles and theses in this regard is indicative of huge attentions by students and technicians. Included in these authors is Narimani (2000) who, in his work Rehabilitation of Historical Textures, presented orderly solutions for organization of aged textures and experiences gained by some countries in this regard.

MATERIALS AND METHODS

In this research, data was collected in two library-based (descriptive and statistical information from books, publications, statistics, and articles) and field-based (interviews, questionnaires, maps, and demarcation of deteriorated areas) manners. To collect primary information, sample surveys were conducted in SardarganIranshahr Locality, Iran. Statistical population included all Sardargan residents. A number of 120 persons were chosen as samples, whose number, with respect to existing time and financial limitations, was determined by Cochran Formula.

To collect required data, questionnaire was designated. In order for a questionnaire to have needed validity, researchers have to show their questionnaire to relevant experts and remove dark spots and defects existing in their instrument. After applying plausible comments, authors would develop their questionnaire and get it affirmed by experts. In order to evaluate questionnaires' reliability, Cronbach's alpha was applied, based on which reliability of this questionnaire was calculated to be %85.2, the value which is indicative of high reliability of this measurement instrument. Analyses were performed in two descriptive and inferential levels. In the former, statistical indices such as percentage and frequency have been employed. In the latter, furthermore, chi-squared test and SPSS and GIS were used, as appropriate.

Fig. 2: Sardargan locality and position of deteriorated textures

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General Characteristics of Deteriorated Textures

Lifetime of buildings: More than %80 of constructions in deteriorated areas has a lifetime of exceeding 50 years. Or else, if they are constructed within the last 50 years, they dispossess required technical standards, as recognizable by their countenance. Resistance to earthquake in such constructions is mostly low, being unable to defy average- to high-pressure earthquakes.
Type of materials: the materials employed in such textures are typically bricks, clay bricks, woods, and iron in which vertical and horizontal connection regulations are disregarded and fuzzy system is absent.
Grading: residential constructions in such textures are mainly fine-grained and area of their arena is less than 200 square meters in average.
Accessibilities: deteriorated textures possess disorderly structures and their accessibilities have essentially been designed for pedestrians: most passageways are either dead-end or have widths less than six meters with low permeability coefficients.
Number of floors: most constructions in deteriorated textures have one floor or two.

Urban services and infrastructures: deteriorated textures confront serious shortage regarding their services, infrastructures, open spaces, green spaces, and public spaces. Interventions in such constructions would be of aggregation and rehabilitation types [8]

Dimensions of Sustainable Development
In a systematic relationship in an interactive and dynamic system, sustainable development might be discussed under the following rubrics [9]:
- Physical and biological aspects (environmental aspects);
- Social aspects;
- Economic aspects; and,
- Physical and skeletal aspects.

More in-depth divisions are possible within each main aspect mentioned hereinabove, which are essential in operation phase.

Viewpoints Regarding Improvement and Rehabilitation of Deteriorated Textures
Culture-oriented viewpoint: Augustus and WelbyNorthmirPugin are founders of this viewpoint. They believe that a good construction has a good performance so that it is recognizable at the first sight. A culture-oriented urban planning decides based on patterns of spiritual needs, dominance of native cultures on non-native ones, dominance of small cities on larger ones, dominance of democracy on dictatorship, and dominance of group needs on personal ones. As a result, a large, geometrical city is negated and general constructions and spaces are emphasized.

Humanist viewpoint: Christopher Alexander, Patrick Geddes, and Kevin Lynch are 20th century scholars who have made their statements on improvement and rehabilitation on the basis of humanist theories. Their theories are influenced by participation urbanization theories presented in the last decade of the 20th century. Their main purpose was to pay attention to people and their participation in urban improvement and rehabilitation based on humanist theories and participation of citizens.

Development-oriented viewpoint: In this perspective, individuals and human beings constitute the foremost focus. Individuals, in their humanistic scientific and literary developments, have made required mental arrangements for a revolt against resilient asceticism into deeps of the Middle Ages. This school focuses on a departure from cultures and histories of the past, as it gives no room for nostalgic ideas in a modern community. Development-oriented thinkers tend to propose a pattern in which four human needs and four main functions of an urban land are emphasized: profession, leisure, housing, and traffic.
Performance-driven viewpoint: It allows for any exploitation of the space aimed at obtaining greater profitability. In this mode of thinking, economic issues are of paramount importance, while social and cultural matters occupy no suitable position. Practical application of this viewpoint comes with the following outcomes:

- Facilitation in new movements through establishment of modern quick connection networks;
- Orientation of space into polarization of activities (chiefly unemployment);
- Drastic changes in social structures;
- Physical demolition of a main part of textures in terms of a reshaping of their functions; and,
- Destruction of architecturally valuable constructions and edifices [10]

Functionalist viewpoint: No school of thought has ever experienced as much disagreements as the Functionalist viewpoint has: it is totally rejected by a group of theorists and, by contrast, utterly known as the most comprehensive view. Despite all such disputes, the Functionalist viewpoint continues to breathe well into the current years since the 20th century. It left huge impacts on geographical studies in the first decades of the 20th century. According to the Functionalist viewpoint, a region is a functional unit as an organism more than addition of its own segments [11].

Sustainable Development viewpoint: Old textures have encountered a crucial conflict in the contemporary age. On the one hand, their spatial and historical identities are defined by pre-industrial human, economic, and cultural identities, and, on the other, they are confronted with powerful requirements and needs of the post-industrial time [11].

Main Urban Framework Organization Viewpoint

In this theory, the impacts by urban development on possession of a clear image of urban frameworks are described. In this way, each part of the city could be able to be expanded in connection with main framework and has the capability to modification. In this theory, harmonization of a city's development system with its natural geographical coordinates is deemed as essential, and this action is known as a suitable instrument for focusing on visual manifestations [12].

Urban Deteriorated Textures Rehabilitation and Improvement Theories
Gentrification theory
Gentrification theory deals with modification of housing plans and improvement of social living in old, central regions particularly for high-income social classes, low-children families, and the youth. In gentrification theory, the fundamental argument is that neighborhoods around core commercial centers are occupied by working classes and poor groups particularly immigrants of color, ethnic minorities, indigenous elderly groups, and immobile groups as a result of congestions, exhaustions, urban environmental pollutions, reduction of urban security, spread of social disorder, reluctance of the private sector for investment, and other defects.

Accordingly, and based on the gentrification theory, urban improvement and rehabilitation is facilitated through encouragement of private and governmental developers and investors. This frustrates low-income and rural groups from living in the region only to be replaced by average groups and high-income classes. This process provokes an increase in rent costs at city-centers, alluring purchasers who search for investment occasions to return to central parts of cities [13].

Dis-Deprivation Theory and Social Planning Strategy

Instead of rehabilitation of monuments, this strategy focuses on socioeconomic plans and resolution of peoples' social and economic problems. According to this theory, required grounds for implementation of urban organization policies and plans are, first of all, identified through analysis of reasons (urban deterioration and deprivation). A study conducted in 1977 regarding central part of cities showed that urban social and economic imbalances have their roots in policy-making characteristics in urban large-scale economic levels. Therefore, this is important to pin such plans as social dis-deprivation, improvement, and rehabilitation into the to-do list instead of physical solutions like improvement and rehabilitation of urban frameworks in order to organize city-centers and other deteriorated regions. Consequently, deterioration and dormancy in city centers and old regions might be known as a cause of economic deprivation and poverty and their improvement paves the path for protection of old cultural textures and necessary developments.

Application of Social Capital as a Persistent Solution in Determination of the Deteriorated Textures Issue

Empowerment of societies using social capital is a relatively new topic in urban planning that can be presented as a persistent solution through completion of required theoretical basics, i.e., Iranization process, in order to diminish poverty levels and improve socioeconomic status of local communities. Participation is completed by social transformations, and it is made compatible to social attitudes, approaches, and institutions. As societal developments are popularized, importance of participation and its role in social development process is more emphasized. Participation is a process of civil self-instruction. Social participation, social reliance, and social coherence constitute building blocks of social capital.

RESULTS

In this section, the data collected from the research's case study is analyzed through inferential statistics. The first hypothesis indicates that "The type of intervention in which functionalist and culture-oriented methods are combined is the most suitable approach to reach at sustainable development."

To examine this hypothesis, functionalist and culture-oriented indices of residents were analyzed in a synthetic manner. In doing so indices such as tendency of residents to rehabilitation using traditional materials, a desire to have rehabilitation in traditional ways, the method by which building densities located in traditional textures are transferred, importance of value of the land, economic interests of residents, preservation of historic buildings and precious textures were investigated.

In order to examine this hypothesis, Pearson chi-square test was applied based on measurement index of variable, whose results are shown in the following [Table-1].

Table 1: results of investigation of functionalist intervention method on development of locality

Analysis method	Value	Degree of freedom	Level of significance
Pearson chi-square test	37,223	16	0.002

According to results of this examination, this is safe to indicate that since significance level of the test, i.e., 0.002, is lower than 0.05 in confidence level of %95, this is concluded thatfunctionalist intervention method provokes sustainable development.

Table 2: results of investigation of culture-oriented intervention method on development of locality

Analysis method	Value	Degree of freedom	Level of significance
Pearson chi-square test	32,831	16	0.008

According to results cited in the [Table- 2], this is safe to indicate that since significance level of the test, i.e., 0.008, is lower than 0.05 in confidence level of %95, this is concluded thatculture-based intervention method provokes sustainable development.

Table 3: results of investigation of the combined functionalist and culture-oriented method on development of locality

Analysis method	Value	Degree of freedom	Level of significance
Pearson chi-square test	30,402	16	0.016

According to results of examination of the first hypothesis, this is safe to indicate that since significance level of the test, i.e., 0.016, is lower than 0.05 in confidence level of %95, this is concluded that the combined functionalist and culture-oriented method provokes sustainable development.

The second hypothesis indicates that "The most important role of residents is their maximized actual participation in rehabilitation and refurbishment of deteriorated textures."

This hypothesis examines the impact of residents' inclination to emit maximized participation in rehabilitation and refurbishment of deteriorated textures. In order to examine this hypothesis, Pearson chi-square test was applied based on measurement index of variable, whose results are shown in the following [Table-4].

Table 4: results of investigation of the impact of maximized participation in reconstruction of the locality

Analysis method	Value	Degree of freedom	Level of significance
Pearson chi-square test	42,335	16	0.000

According to results of the Table 4, this is safe to indicate that since significance level of the test is equal to 0.000 is in confidence level of %95, this is concluded that the residents' inclination to rehabilitate texture of their living region leaves impacts on their participation degrees.

Outcomes of the Research

According to results of questionnaires, socioeconomic and physical characteristics of the texture under investigation are as follows:
- An amount of %74 of persons under study has academic degrees lower than diploma. In this study, around %26 of subjects have high academic degrees.
- Most subjects, i.e., %70 of them, determined their income levels to be ranging between 300,000 to 500,000 Iranian Rials.
- Respecting occupations, the highest frequency, i.e., %32.5, was allocated to self-employed persons, and the lowest frequency, i.e., %8.3, to retired ones.
- The people under study indicated their most important reason for living in Sardargan to be their kinship relativities (%50), low-priced housing facilities (%38), and vicinity to their workplace (%12).

- An amount of %51.7 of subjects indicated that their educational, recreational, and green space accessibilities in Sardargan are weak. By contrast, an amount of only %11 of subjects regarded acceptable their access to such functions.
- An amount of %58 of subjects have high tendency to leave Sardargan, and only around %12 of them incline to remain at Sardargan Locality.
- An amount of only %17 of subjects is satisfied with the manner by which their locality is subject to rehabilitation; while, almost %50 of subjects are dissatisfied with this conditions.
- More than %50 of the individuals under study have evaluated quality of the monuments in Sardargan Locality as *unsuitable*. Whereas, only %8 of subjects regarded as *suitable* the quality of the monuments in their locality.
- Most subjects, i.e., %66, consider as essential the rehabilitation of Sardargan Locality, and only %7 rejected such rehabilitations.
- An amount of only %16 of subjects has reliance on municipality of the region to make engagements; while, around %42 of them are distrustful of the manipulations performed by the municipality.
- Most passageways of this locality are made of compound pavements, and only a limited number of passageways are of asphalt pavements.
- According to the research's results, this may be indicated that %75 of the subjects wish rehabilitation projects to be performed in their locality, from which an amount of %49 demand a combined participation by people and municipality.
- Results show that %25 of buildings are newly constructed, %58 of them are reformed, and around %17 of them are to be destructed.
- The most important problems in Sardargan are stricture of passageways (%61), deterioration of locality's textures (%20), and absence of environmental health (%7.5).
- Main causes of locality texture's deterioration are archaism of the region (%34) and high density (%31), as suggested by residents therein. Inattention of civil managers and low levels of residents' income (%17.5) are tanked next.
- Results show that only %32 of buildings are lodged by one family, and the rest are shared by several households. Three families in one unit has the highest frequency (%32) and more than four families in one unit has the lowest frequency (%1).

DISCUSSION AND CONCLUSION

The present trends of urban rehabilitations and improvements are illustrative of the fact that these regions would be subject to higher problems in case preventive actions are failed to be adopted and governmental and municipal measures remain in the same levels as before.

The first hypothesis indicates that "The type of intervention in which functionalist and culture-oriented methods are combined is the most suitable approach to reach at sustainable development."
According to the analyses, this is concluded that residents are, in a synchronous manner, inclined to complete rehabilitation projects in a combined functionalist and culture-oriented method. It means that the more they are inclined to maintain their older edifices and values, the more they are attentive to their economic interests. Accordingly, the first hypothesis of the research is affirmed.

The second hypothesis indicates that "The most important role of residents is their maximized actual participation in rehabilitation and refurbishment of deteriorated textures."

Based on the results, this is expressed that the level by which residents are inclined to have renovated locality affects their tendency to participate in this issue. It means that the higher they are inclined to rehabilitate their region, the higher would be their participation degrees in this regard. Accordingly, the second hypothesis of the research is affirmed, as well.

Suggestions
- Wholly unvalued buildings are proposed to be destructed only to construct green spaces and civil facilities in their stead. Civil environmental conditions should be bettered.
- New functions, as proportionate with nature of constructions and spaces, are suggested to be allocated. New urban spaces are to be established to prevent deterioration of older functions. Interiors of residential houses

are proposed to be modernized and present-age infrastructural facilities to be employed. Incompatible functions are suggested to be effaced.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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ARTICLE **OPEN ACCESS**

THE EFFECT OF FLEXIBILITY ON ORGANIZATIONAL PERFORMANCE IN THE PRIVATE BANKS OF ABADAN

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ABSTRACT

Flexibility was introduced and emphasized as an organizational capability. Companies are able to improve performance through flexibility and in today's competitive and dynamic business environment. This study is conducted with the aim to examine the impact of flexibility on organizational performance private banks of Abadan city. The population of the This study is composed of 9 banks (Saman Bank, Shahr Bank, Pasargad Bank, KarAfarinBank,Pasrian Bank, Ayande Bank, EghtesadeNovin Bank, Ghavamin Bank, Sinai Bank).the method of current research is considered descriptive based on objective, functional and in terms of data collection method and is considered experimental research based on the relationship between research variables and is specifically based on structural equation modeling. Two questionnaires (flexibility and Organizational Performance) is used for measuring research variables and PLS and SPSS.18 software are applied for statistical analysis. The results of analysis of questionnaires indicated that the flexibility and (its dimensions) have positive and significant impact on organizational performance.

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INTRODUCTION

Rapid and unpredictable changes are of the main features of today's competitive environment. So managers in addition to focus on activities within the organization, should pay greater attention to the rapidly changing environment that surrounds the organization And it would have forced organizations to become more agile, flexible structures So that they can rapidly respond to new market opportunity with minimal investment and risk. What can be confirmed in the initial of the third millennium is that, as time passes, methods of administration and management of manufacturing organizations is less similar to the previous time and environmental requirements of enterprise dictates the necessity to apply new models, approaches and tools to the organization for success and survival.Company executives are aware of the benefits of flexibility, but unfortunately, little theoretical frameworks and models exist to help managers understand and identify the different types of flexibility and the creation and maintenance flexible organizations. Rapidly evolving and competitive market environment imposed additional pressure on organizations for quick adaptation and results in changes in higher levels. The challenge for organizations to create flexible structures and create flexibility in the current changing world, is more than ever before. Business must be flexible enough to manage unpredictable threats and available opportunities in uncertain future and unstable environment. So banks to be able to adapt to the changing needs of the market and customers, should have flexible structure. This research is important and necessary to understand and identify flexibility; flexible structures and dimensions include flexibility and by understanding them, create a way towards exploiting the opportunities. Rapid changes and dynamics of competitive markets make access to felexibility[1] more necessary than before. Flexibility is not a voluntary and spontaneous phenomenon,but organizations should identify factors affecting the flexibility to create them [1]. In the today worlds the change is rapid and successful flexibility is an important integral of success in current era. Rapidly evolving and competitive market environment imposed additional pressure on organizations for quick adaptation and results in changes in higher levels. The challenge for organizations to create flexible structures and create flexibility in the current changing world, is more than ever before. Business must be flexible enough to manage unpredictable threats and available opportunities in uncertain

future and unstable environment. Usually, flexibility and inflexibility are mixed and the thing that is emerging is a new alternative for simple trends towards more flexibility [2]. Thus, the flexibility to fit the turbulent business environment in order to maintain a competitive advantage is one of the main challenges today's managers are facing. Organizational flexibility with regard to resources and management abilities allows organizations to match themselves with environment in environmental changes. Flexibility is considered as a good act, although it is not an absolute good. [3]believed that an organization can respond better to change if get more flexible.

Generally, flexibility can be considered as an indicator of the link between the system and its external environment to attract uncertainties, the dynamics of the system as well as the ability to change and adapt [4].On the other hand, one of the arguments about the organizational flexibility is its role in the success of organizations.In the past two decades, flexibility increasingly stressed as an organizational capability that enables companies to gain competitive advantage and maintain it and improve performance in today's dynamic and competitive business environment[5]. According to the results of [5] studies Five determinant of organizational flexibility as a set of organizational and managerial capabilities have been identified based of which, some companies are able to adapt themselves with the changes of an environment of intense competition that includes: 1- index of management team 2- Template decision 3- Organizational Culture 4- Understanding the environment and 5- organizational identity.

Thus, given theoretical nature of the research, we seek to study the effect of flexibility Retrieved from [5] model to Organizational Performance. So the main question of this research is that: How does flexibility impact on organizational performance?

MATERIALS AND METHODS

Theoretical framework of the research

In this part of the article, we outline the literature of the subject and background of the research regarding to organizational flexibility and organizational performance.

Flexibility

The literature of the management subject indicates that flexibility is considered as a good act although it is not an obsolete good. [6] believed that if an organization becomes more flexible, it can respond better to change. One of the reasons that make defining flexibility difficult is that the definitions are often changeable due to special management circumstances or issues. Generally, flexibility can be considered as an indicator of the link between the system and its external environment to attract uncertainties, the dynamics of the system as well as the ability to change and adapt. Flexibility is considered as a key element for sustainable activities [6]. On the other hand, one of the arguments about the organizational flexibility is its role in the success of organizations. In the past two decades, flexibility increasingly stressed as an organizational capability that enables companies to gain competitive advantage and maintain it and improve performance in today's dynamic and competitive business environment.Company executives are aware of the benefits of flexible but unfortunately, little theoretical frameworks and patterns exist to help managers understand and identify the different types of flexibility and the creation and maintenance of flexible organizations. While today flexibility is a criteria for evaluation and assessment of performance in most organizations [7]research introduced Five determinant of organizational flexibility as a set of organizational and managerial capabilities of which , some companies are able to adapt themselves with the changes of an environment of intense competition that includes: 1- index of management team 2- Template decision 3- Organizational Culture 4- Understanding the environment and 5- organizational identity.

- Index Management Team
Management refers to the people who set the company's orientation. In companies with high flexibility, the lack of homogeneity among the top management is more visible. But in inflexible companies more homogeneity is seen among the managers.
- Template decision
Refers to the concentration of decision-making at lower levels of the organization, Whether decision-making is done centralized or decentralized.
- Organizational Culture
Refers to the extent in which an organization stands on industrial macro culture and also shows how quickly an organization can adapt new strategies.
- understanding the environment
Administrators can understand the environments, events and movements through survey and overcome them.
- Organizational identity
Because of the key role of core values in the concept of corporate identity, Impact of core values on organizational flexibility is studied. Strong identity causes companies to be flexible.

RESULTS ANS DISCUSSION
Organizational performance

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Today's world, especially the world of organizations, is changing dramatically and constantly and all aspects of the organization of the internal environment to the external environment, of human to non-human factors and etc. all are changing from one state to another with stunning acceleration. Performance is one of the most important structures which is discussed in management research and without doubt is considered as the most important measure of success in commercial companies[8]. Performance is a broad concept which covers what a company produces as well as areas they interact [9].

In most organizations around the world, managers and corporate leaders always are seeking to improve performance of their organizations. Performance of the organization is a wide combination of intangible achievements as well as increasing organizational knowledge and concrete and tangible achievements like Economic and Financial Results[10]. Performance literally means the state or the quality of work, so organizational performance is a general structure which refers to how an organization operates[11]. The Most popular definition of performance is offered by [11] as "the process of determining effectiveness and efficiency of past action. According to this definition, performance is divided to two parts: efficiency which describes the manner an organization uses resources in the production of services or products; it means the relationship between the real and the ideal combination of inputs for manufacturing specific outputs and 2- Effectiveness which describes the degree of achievement of organizational goals.

Research model and hypotheses

Figure-1 show a conceptual model which is proposed based on theoretical foundations. This model indicates the effect of flexibility on organizational performance based on [12]model**Figure- 1**.
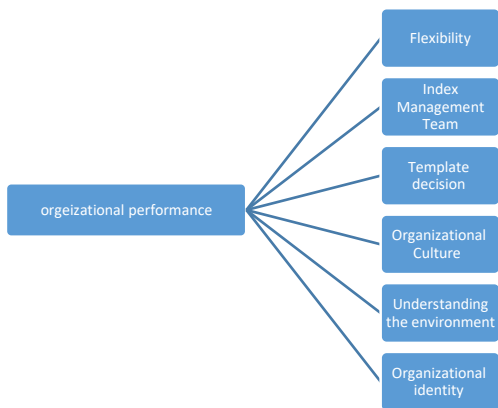
Fig: 1. Conceptual model of research (researcher- made)

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Research Hypotheses

The main hypotheses: flexibility has a significant and positive effect on organizational performance in private banks of Abadan city.
Sub-Hypotheses:
Sub-Hypotheses 1- index management team has a significant and positive effect on organizational performance in private banks of Abadan city.
Sub-Hypotheses 2- template decision has a significant and positive effect on organizational performance in private banks of Abadan city.
Sub-Hypotheses 3- organizational culture has a significant and positive effect on organizational performance in private banks of Abadan city.
Sub-Hypotheses 4- understanding the environment has a significant and positive effect on organizational performance in private banks of Abadan city.

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Sub-Hypotheses 5- organization identity has a significant and positive effect on organizational performance in private banks of Abadan city.

Methodology

The current study is considered descriptive based on functional goal and the manner of data collection and is experimental based on the relationship between the variables. The population of this research is composed of staff and manager of private banks in the city of Abadan: Saman Bank (14 people), Shahr Bank (5 people), Pasargad Bank (12 People), KarAfarin bank (8 people), Parsian Bank (8 People), Ayandeh Bank (9 people), EghtesadNovin (10 people), Ghavamin Bank (12 people), Sina Bank (8 People), census approach was used to select the type of sampling. Questionnaire which was made by the researcher by the help of the experts in management and organizational [12] Questionnaire was used for measuring flexibility. A total of 86 questionnaires were distributedAnd the same number, valid questionnaires were collected from respondents. The questions are divided into two categories: general and specialized questions which are based on five-point Likert scale(Very low, low, medium, high and very high).In order to determine the reliability of the questionnaires the method of Cronbach's alpha using statistical software of SPSS.18 is applied. In **Table-1**, number of items offered for measuring each variable and Cronbach's alpha coefficient of each variable is specified**Table- 1**

Table: 1.reliability of measuring tool of the research

Variable	reliability coefficient	No. of items
Flexibility	0/885	15
Organizational performance	0/727	6

As can be seen in above table, Cronbach's alpha coefficient is indicator of reliability and validity of research instrument**Table– 2**

Table: 2. Descriptive findings of the Variables studied

Variable	mean	Standard deviation	Significance of t test	95% confidence interval of Difference	
				lower	higher
Index of management team	3.4186	.78413	.000	.2502	.5867
Template decision	3.3052	.79927	.001	.1339	.4766
Organizational culture	3.2442	.71295	.002	.0913	.3970
Understanding the environment	3.3411	.67248	.000	.1969	.4853
Organizational identity	3.1977	.75256	.017	.0363	.3590
Flexibility	3.3014	.62125	.000	.1682	.4346
Organizational performance	3.2907	.61420	.000	.1590	.4224

First criterion

Assessment of reliability is possible in several ways: measurement of Factor loading coefficients, Cronbach's alpha coefficient and mixed reliability.

- The criteria for the suitability of factor loadings coefficients is 0.4 that in this model all factor loadings of obvious measures are higher than 0.4 too which shows suitability of this criteria.
- After evaluating of factor loading coefficients, it is time to calculate and report Cronbach's alpha coefficients and mixed reliability of the constructions**Table- 3**.

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Table: 3. Factor loading coefficients, Cronbach's alpha coefficient and mixed reliability of research variables

variable	Measurement of factor loadings	Cronbach's alpha	mixed reliability
Organizational performance	0.746957	0.842700	0.884929
flexibility	0.628285	0.913850	0.925886
Organizational culture	0.696053	0.739009	0.806610
Organizational identity	0.752981	0.733767	0.810412
template decision	0.766701	0.828853	0.886307
understanding the environment	0.638489	0.829728	0.897983
Features of group decision making	0.583612	0.747963	0.809782

Second criterion

Second criterion for fitting measurement models is convergent validity which studies the correlation of construction with its items (index). AVE criteria by software Smart PLS is used for this purpose. [12]have introduced 0.4 and above as appropriate value for the AVE that according to **Table- 4**indicates that convergent validity is appropriate for this model. As a result, given that the appropriate value for Cronbach's alpha[12], reliability [13]and AVE [13] are 0.7, 0.7 and 0.4 respectively, And in accordance with the findings of graphical model ,All of these measures have received the right amount of latent variables**,** The appropriateness of the reliability and convergent validity study can be confirmed**Table- 4.**

Table: 4. convergent validity

Variable	AVE
Organizational performance	0.564686
flexibility	0.456196
Organizational culture	0.583467
Organizational identity	0.681421
template decision	0.661016
Understanding the environment	0.745912
Features of group decision making	0.586931

- Third criterion

Divergent validity is the third criterion for fitting of measurement models. To study the divergent validity by comparing the amount of correlation of a construction with it index against the correlation of that construction with other constructions, it can be act according to [14] too.For this purpose their proposed matrixwhich contains the square root of AVE values of two constructions in main diagonal and correlation coefficients of latent variables are drawn. As you can see in **Table- 5**, root amount of AVE of latent variables in current research which are located at main diagonal of the matrix, are higher than the coloration among them which are arranged in the lower and left side houses of main diagonal. Then it can be said that validity and divergence of the model is at appropriate limit**Table– 5**.

Table: 5. Matrix proposed by Fornell and Larker for measuring divergent validity

	AS	EN

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AS	AVE ≅ √0.56=0.75	
EN	0.619336	AVE ≅ √0.46=0.68

Goodness of fit of general Model (GoF criterion)

GoF criterion is generally used for fitting the model and is calculated by following formula:

$$GoF = \sqrt{\mu Communalities \times \mu R2}$$

μCommunalitiesis gained from mean common values of latent variables of higher order of flexibility and organizational performance. According to the below table, this values in the report output reached by the command PLSAlgorithm are respectively 0.46 and 0.56. Then the average of Communalities will be 0.51 **Table-6.**

Table: 6. report output reached by the command PLS Algorithm for Communalities of latent variables

	communality
AS	0.564686
EN	0.456196

On the other hand, output reached by the command PLS Algorithm shows that the amount of R^2 for Endogenous variables of the model is 0.52 which with the existence of two values for mean Communalities would be:
GoF= √(0.51 ×0.52)=0.514

Giventhree values of 0.01, 0.25 and 0.36 as weak, moderate and strong values respectively for GoF, the amount of 0.514 for this criterion is indicative of strong general fitness of the model.

The findings result from measuring research hypotheses

After measuring the fitness of measurement models of general model, research hypotheses can be measured. This section includes two parts as fallow:
- Studying significant coefficients z corresponding to each of the hypotheses
The output of the model using Bootstrapping command which is indicated in **Figure- 2**, shows that significant coefficients of the path between organizational performance and flexibility variables is higher than 1.96 and significant**Figure– 2**.

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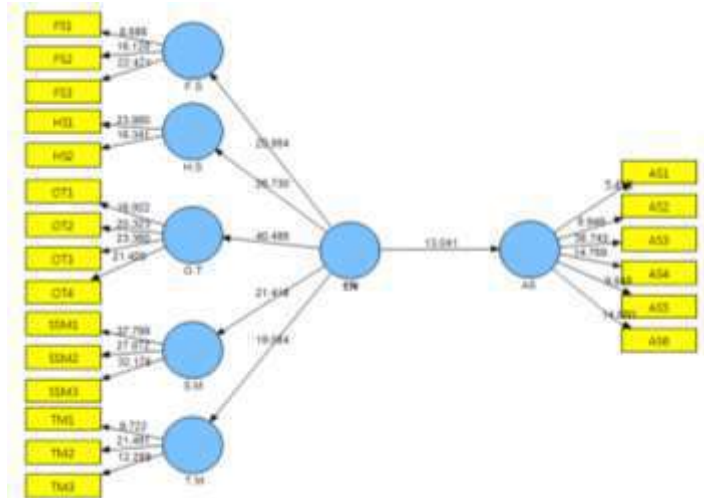
Fig: 2. graphical model with significant coefficients z

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Studying standardized coefficients of the paths related to the hypotheses

After studying the amount of significant of the way between the variables, now is turn to study the intensity of effects. Output from PLS Algorithm command shows the model of research in addition to factor loading coefficient. The standardized coefficient of the path between flexibility and organizational performance (0.719) indicates who much dependent variable can be explained by independent variable. Therefore, the null hypothesis is rejectedand the main hypothesis of the research is confirmed**Figure– 3**.
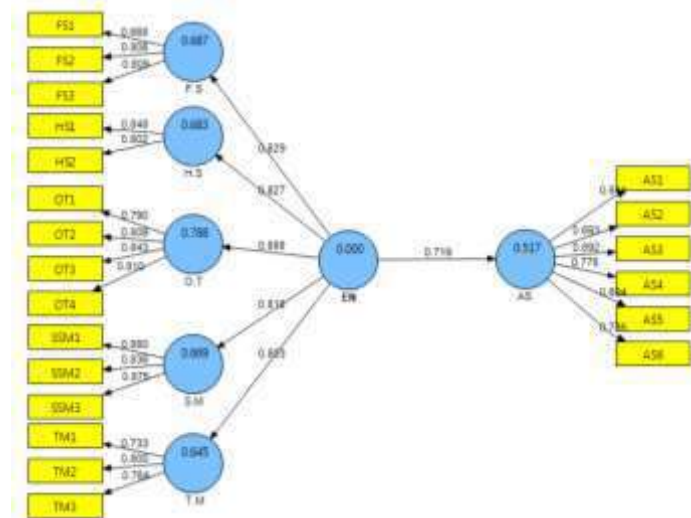
Fig: 3. general model of the research in addition to Factor loading coefficients

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Test results of sub-hypotheses

For testing sub-hypotheses of the research, significant coefficients z and standardized coefficients of the paths related to hypotheses were studied again. The output of the model indicated that Significant coefficients of the way between variables of management team's features with organizational performance, Template decision with organizational performance, Organizational Culture with organizational performance, Understanding the environment with organizational performance and organizational identity with organizational performance is higher than 1.96 and significant. After studying significance of the path between the variables now it is the turn to study the intensity of the effects. Standardized coefficient of the path between variables of management team's features with organizational performance (0.742), Template decision with organizational performance (0.638),

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Organizational Culture with organizational performance (0.620), Understanding the environment with organizational performance (0.503) and organizational identity with organizational performance (0.866) is indicative of the amount dependant variable can be explained by independent variable. Therefore, the null hypothesis is rejectedand the main hypothesis of the research is confirmed**Table– 7**.

Table: 7. test results of sub-hypotheses

Main hypothesis	flexibility	organizational performance	0/719	13.041	Confirmed
Sub-hypothesis 1	Index of management team	organizational performance	0/742	19.064	Confirmed
Sub-hypothesis 2	Template decision	organizational performance	0/638	40.486	Confirmed
Sub-hypothesis 3	Organizational Culture	organizational performance	0/620	20.864	Confirmed
Sub-hypothesis 4	Understanding the environment	organizational performance	0/533	21.418	Confirmed
Sub-hypothesis 5	organizational identity	organizational performance	0/833	26.730	Confirmed

CONCLUSION

This study showed that flexibility and its five dimensions have significant and positive impact on organizational performance. **Table- 7 and Figure- 2 and 3**indicate the results of testing structural relations between the variables of the research.

- The findings of the research is indicative of main hypothesis confirmation with path coefficient of 0.742 and significant figure of 19.064. Considering that statistic t was 19.064 and this value is higher than 1.96 then the dimension of management team features has significant impact on organizational performance. On the other hand,
- The findings of the research is indicative of the first sub-hypothesis confirmation with path coefficient of 0.719 and significant figure of 13.041. Considering that statistic t was 13.041 and this value is higher than 1.96 then flexibility has significant impact on organizational performance. On the other hand, Standard estimated coefficient is 0.742 which shows that the impact is positive and significant.
- The effect of template decision on organizational performance was tested for the second sub-hypothesis. The findings of the research is indicative of the first sub-hypothesis confirmation with path coefficient of 0.638 and significant figure of 40.486. Considering that statistic t was 40.486 and this value is higher than 1.96 then template decision has significant impact on organizational performance. On the other hand, Standard estimated coefficient is 0.742 which shows that the impact is positive and significant.
- Output results of the software shows that the effect of organizational cultural on organizational performance is confirmed. The findings of the research is indicative of the third sub-hypothesis confirmation with path coefficient of 0.620 and significant figure of 20.864. Considering that statistic t was 20.864 and this value is higher than 1.96 then the dimension of organizational cultural has significant impact on organizational performance. On the other hand, Standard estimated coefficient is 0.620 which shows that the impact is positive and significant.
- Results from analysis the forth sub-hypothesis confirm this hypothesis. Research findings is indicative of the third sub-hypothesis confirmation with path coefficient of 0.533 and significant figure of 21.418. Considering that statistic t was 21.418 and this value is higher than 1.96 then the dimension of understanding the environment has significant impact on organizational performance. On the other hand, Standard estimated coefficient is 0.533 which shows that the impact is positive and significant.
- Results from analysis the fifth sub-hypothesis confirm this hypothesis. Research findings is indicative of the third sub-hypothesis confirmation with path coefficient of 0.833 and significant figure of 26.730. Considering that statistic t was 26.730 and this value is higher than 1.96 then the dimension of organizational identity has significant

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impact on organizational performance. On the other hand, Standard estimated coefficient is 0.833 which shows that the impact is positive and significant.

The results of this research are similar to other studies that have been conducted in this area for example [14] arrived to this conclusion that the organizational flexibility, including both operational flexibility and strategic flexibility has an impact on organizational performance. [14] stated that Flexibility to fit the environment in order to maintain a competitive advantage is a challenge for today managers. [15]explained that Organizational flexibility increasingly emphasized as an organizational potential and enables companies to gain competitive advantageand improve performance in today's dynamic environment. [15], [16] postulated that Organizational identity has an impact on operational performance. [17] stated that the existence of operational teams increase function. [17] concluded that the more the attention is paid on indicators of organizational culture, the better employee performance will be and with measures such as improving and strengthening cultural factors that have the greatest effect on employee performance, further improvement of organizational culture and performance of the staff can be seen. [17] stated in their research that there is a significant and positive relationship between organizational culture and effectiveness. [17] stated that there is a significant relationship between organizational culture and productivity. Research results of [18] contains that Organizational culture has a significant relationship with organizational performance. The results of [19] research indicated that organizational culture and performance has strong relationship with each other.

These results indicated that with recognition of managers and organizations from the concept of flexibility, the importance and its role in the behavior and performance of the organization will increase. For this purpose, it is proposed to have: management team with the right mix of different ages, working experience, focus on strategic level and less focus in operational level of decision-making, Creating organizational culture relatively independent of the Bank culture, Monitoring the environment and investigating incidents and events using formal and informal systems, having a strong Organizational identity and appropriate core values, having different options and scenarios and separate programs to deal with the possible future situations, creating the appropriate fields for quick change of competitive strategy against unforeseen environmental changes, continuous improvement of employee skills as a principle by managers and institutionalize it in the organization, senior management full support of continuous change programs, integration and coordination and full cooperation in establishing processes, Full coordination of integration system and team building system with other systems of the organization, employee participation in programs and quality objectives of the organization, the need to engage employees and users in organizational processes and procedures because of importance of staff in achieving satisfaction and reduce the causes of resistance and lift spirits which these factors improve the sense of self-esteemed towards the organization, and finally try to improve the performance and effectiveness of the system, Allocate sufficient financial and human resources through senior managers to approve a management philosophy and organizational methods in order to support organizational values, and inducing an flexible, collaborative and supportive organizational culture, try to identify the capabilities and value-added processes, as well as the identification of important units in creation actual and potential customers and allocation of resources to these processes and units in order to gain competitive advantage, evaluation and renovation of processes, structure, functions and goals of the organization by sophisticated authorities and experts sophisticated, in such a way that organization be sufficiently ready to overcome changes and uncertainties, to promote flexibility of the organizations and create a basis for dynamics and moving towards improving organizational performance.

CONFLICT OF INTEREST
Authors declare no conflict of interest .

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MEASUREMENT OF ORGANIZATIONAL TRANSPARENCY USING ROUGH SET THEORY APPROACH (CASE STUDY: ZARAND POWER PLANT)

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ABSTRACT

Aims: The purpose of this research examines the organizational transparency using Rough Set Theory. This is practical research and statistical population included all employees of Zarand power plant that with referring to the Morgan table determined 53 people, and data Collection tools was questionnaire. In order to determine reliability coefficient was used Cronbach alpha greater than 0.7. In this survey, the organizational transparency was observed by using actual data size, staff participation, responsiveness and secrecy. Materials and methods: In order to analyze the data has been used of rough set theory. For this purpose, after the formation of standardized tables, in the next step were identified compatible and incompatible materials and then was formed the tables. Results: Eventually, overall results showed that if the transparency of information are in the quantitative level and the actual data is not available to employees, then organizational transparency will be at a quantitative level. According to the results, employee participation and secrecy aspects in the average level are effective in the rate of organization transparency and moreover, the results showed that responsiveness increase organizational transparency of employee.

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INTRODUCTION

In Today's changing world organizations to survive require looking for new tools and organizational transparency is one of the tools that can help organizations to meet goals. People prefer to work in a transparent environment that is clear their role and to be aware of their expectations of their superiors. When increase the role transparency will also increase satisfaction [1].People need adequate information to effectively carry out their duties. Lack of information about their goals and effective job behavior can lead to ineffective and inadequate efforts to perform the duties and reduce job performance [2]. Staff who have clear goals and are aware of how to achieve these goals, believe that they can do their jobs skillfully and have sense of competence. Employees with uncertain expectations, are reluctant to do the work. The high levels of role clarity, enable staff to offer solutions to discharge their functions effectively and it increases the autonomy or freedom of action. Lack of role clarity induced this belief in them that they in need of assistance, so decreases effective in their working environment [3]. Employees who have an understanding of their role will make decisions that will be effective in work results[4]. The consequences of transparency in terms of organization, and it can include items which contributes to increasing productivity of organization and for this reason is important for administrators and policymakers and organizations and shareholder.

Reduce corruption (occurred by preventing corruption or combating corruption), increase effectiveness, increase quality and reduce service price in competition, increase accountability, reduce unnecessary regulatory costs, improve the structure and enhance public confidence in organizations among the consequences are clear in this respect. Due to the advantages of transparency in the organization, this research aims to evaluate the organizational transparency using Rough Set Theory.

MANAGEMENT

Organizational transparency

Transparency is one of the issues that many researches has been done in this field and has attracted the attention of scholars. Role clarity refers to the people's beliefs about the expectations and behaviors related to their job roles[5].Clarity of role can be described as lack of role ambiguity and role conflict. Role conflict as the situation given to individual that are in conflict and role ambiguity is refers to the lack of role clarity .Role clarity causes doing the job better and duties that the organization is set up for it and a global view and individual attitude towards their duties and responsibilities will change and In order to achieve organizational goals, individual goals can be fulfilled[6].On the other hand, Hayes described transparent organization as follows: public access to all information, whether positive or negative that can be published legally in a detailed manner, equivalent, and unequivocally to fulfill the aim of increasing reasoning ability of public and accountability of organizations in the actions, policies and practices[7].

Berggren and Bernshteyn according to studies of Bern (2004), Lindstedt, and Naurin (2007) and others in the field of organizational transparency considered aspects and stated thatusing the explicit dimension in organization and can be realized transparency of the organization. These dimensions include:
Perspective: represents the ideal future of organization,

Mission: indicates the values and priorities of an organization, the mission of the organization represent the whole activities of organization in terms of products and markets,

Objectives: Each organization has two sets of short and long-term goals. Can be defined long-term goals as a certain result in supply mission, these goals determine the company direction and objectives of the company's long-term period, and is a period that exceeds one year. Annual goals, is short-term goal that the company to achieve long-term goals is require to be achieved it And performance dimension: that refers to the overall work of the organization [8].Bushman et al. in 2004 proposed framework for the transparency of their organization, they put reporting organizations, initiate accessibility to information and dissemination of information in this context. Rawlins (2008), examined the transparency theory, and in theoretical principles related to the transparency, added the four dimensions as the secrecy to definition that proposed by Hayes: he proposed four dimension of the actual data, employee participation, responsiveness and secrecy that was the reverse factor of measurement, as the dimensions of organizational transparency [9].

Transparency of information is described as follows: organizations are trying to understandable their actions and decisions for individuals or groups who are interested in applying organizations or ascertainable and decisions, in addition to the stated information, awareness of its supply is significant. Shareholders should understand or believe this organization is transparent and give them what they need to know, it is said that since the concept of substantial information is in relation to the needs of the recipient that the sender needs, transparency cannot meet this standard charge unless the organization know and should know, the needs of beneficiaries .Therefore, the participation of beneficiaries promotes disclosure to transparency.
Transparency, is a process which has not only availability of information, but also are included actively participate in the acquisition, distribution and creation of knowledge. Transparency also requires responsiveness, transparent organizations for actions and decisions of their speech, because this information is available for others assessment.
Also, the secrecy is meant to deliberately hide proceedings, and transparency is deliberately reveal their meaning [9, 10].

Often, it is expected that organizational transparency brought positive results. Among these consequences cannot the following items:
Employee involvement: Transparency organization makes it possible for employees to better understand their role in organization and consequently has more focus on their duties and greater participation in organizational activities.
Creating confidence in the organization: organizational transparency is increase employees confidence to senior management.
Increase creativity: Organizations without creativity and innovation are impossible. Organizational transparency makes it possible for employees to freely express their different opinions. In transparent organizations employees can express their weak and non-functional opinions without fear and despair.
Improved performance:Because organizational transparency increases employee's confidence to organization manager and also provides infrastructure of employee participationand encourages creative ideas,will also have a positive impact on individual performance.

Increase employee job satisfaction:Employees who are creativeand participate in the organization,will tend to be aware of relating information and in this way, will Investment for their role and eventually will have more job satisfaction[11].
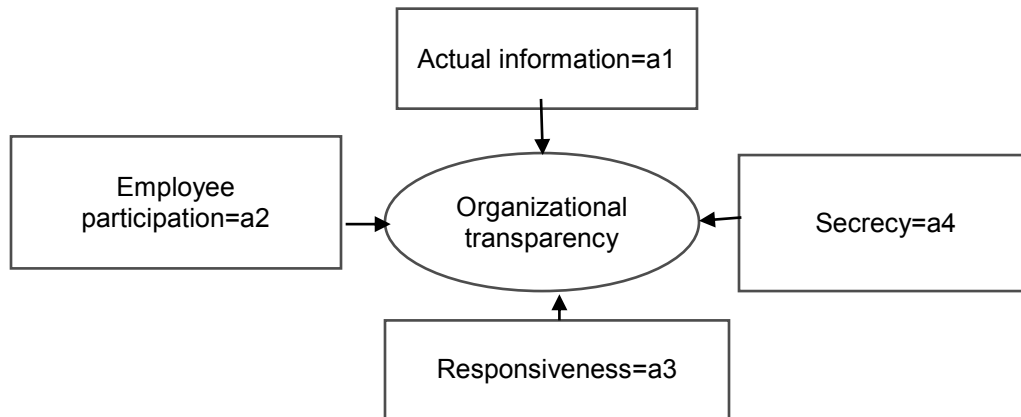
Fig: 1. Conceptual Model
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Research questions

What's the level of employee in organizational transparence?

MATERIALS AND METHODS

Rough set theory can be the basis for detailed reasoning in uncertain information [12].One of the most important applications of Rough Set is classification and categories. The main purpose of Rough set analysis is obtaining approximate concepts of acquired data and to provide methods for removing surplus to requirements information. can be used Rough set in the solution of major problems in the field of data analysis, including: Identified a set of objects based on attribute values, find dependencies between features, remove (cut or trimmed) extra features (data), finding the important characteristics, production decision rules. Rough set theory method, is the first step for the analysis of incomplete, vague and imprecise data. This theory just used login information (presented and existing) and like the rest of methods such as fuzzy and probabilistic models, does not need to take into consideration additional assumptions in the model. In other words, this theory instead of using parameters and additional variables, conducted their analysis only based on the available information. Rough set theory can identify and interpret existing relationships and structure, and major affecting factors on the data. Rough sets philosophy is based on the assumption that should be considered every object in the world as information (data, knowledge). Described objects by standpoint of available information are unrecognizable. Being indistinguishable relationship (causal relationship) obtained in this method is the basis of mathematics rough set theory. Each set of indistinguishable objects is called fundamental collection and is a form of core component atom of knowledge about the world. Human knowledge of phenomena is based on human experience, samples, and his findings. This information can store in a general system which is called information system. This information system including information about the specifically discussed issues (subject, observations, samples, examples, results, events, etc.) and its related factors are (features, specifications, variables, signs).

This complex features can be divided into two categories. The first category of them is test results and measurements or observational data, and are estimated is called features and the second category is the situation that is related to experts decision-making, or the result of events and identify and assess the results with respect to the features or make decision referred to these features. However, anything or any issue and phenomenon can be defined by two sets of features. So, any subject and phenomenon can be defined by two sets of features. One Category is features and specifications of phenomena and the other category is the characteristics of the decision (evaluation). So, according to the Second category of these features and see the differences between them and classify different in different theme (sample), can evaluate the status of features [13].In this study, two types of decision variables and conditional variables are taken into account. In Rough, variables condition, based on four levels: "real information, employee participation, responsiveness and secrecy" and organizational transparency is the decision variable.

In this study, was used a survey method to gather information, so it can be placed on the field research. The study population consisted of employees of Zarand power plant that refer to the chart Morgan, 53 subjects were determined, To gather the data, was used 26 items and Cronbach's alpha greater than 0.7. Examined factors in the questionnaire regulated through closed questions and with 4-point Likert scale. 26 items to measure organizational transparency. So

at the minimum points of one responsive was min = 26 and the maximum points of responsive was max=104. Overall, in this study, were considered three levels as decisions that are given in the following **Table-1**:

Table: 1. Classification of features (a ∈ A)

Row	Scores range	Verbal value	Code or numerical value
1	26≤ a (X)≤52	Low	1
2	53≤ a (X)≤79	Average	2
3	80≤ a (X)≤104	High	3

Feature of Decision Making and its categories are listed in the below **table-2**:

Table: 2. Features of decisions making and its verbal values

Feature of Decision Making	Imaginable states		
The organizational transparency	High	Average	Low
Numerical value or code	3	2	1

Two types of rules is applicable in decision table:

1. Incompatible Rule (inconsistent): are rule that has the same position but has different decision features.
2. Compatible rule: the rule that is not incompatible.

Based on these two principles can be written equivalence class position and after forming reduced matrix can be deduced.

RESULTS

With considering the organizational transparency in column D as features of decisions making and taking into account the characteristics of different positions in the column of a1 to a4, data analysis was conducted and Instead of mentioned numbers in **[Table– 1]**, replace the code and In other words, standardize them. Information System is shown in **[Table–3]**:

Table:3.Table Decision

U	Actual information=a1	Employee participation=a2	Responsiveness=a3	Secrecy=a4	Organizational transparency=d	N
X1	3	3	3	2	3	6
X2	2	2	2	1	2	5
X3	1	1	1	3	1	4
X4	2	2	2	3	2	6
X5	3	1	3	1	3	5
X6	2	3	3	2	2	5
X7	1	2	1	2	2	6
X8	1	1	3	2	3	6
X9	1	1	3	2	1	5
X10	1	1	3	2	2	5

Table: 4. inconsistent Components in decision table

U	Actual information=a1	Employee participation=a2	Responsiveness=a3	Secrecy=a4	Organizational transparency=d
X8	1	1	3	2	3
X9	1	1	3	2	1
X10	1	1	3	2	2

Table: 5. consistent component in decision making table

U	Actual information=a1	Employee participation=a2	Responsiveness=a3	Secrecy=a4	Organizational transparency=d	N
X1	3	3	3	2	3	3
X2	2	2	2	1	2	2
X3	1	1	1	3	1	1
X4	2	2	2	3	2	2
X5	3	1	3	1	3	3
X6	2	3	3	2	2	2
X7	1	2	1	2	2	2

The decision tables we consider consistent rules. For this reason, aside the components of the **[Table–4]**, and at a later stage we consider **[Table–5]**.

Equivalence collection

A= {a1, a2, a3, a4}

V (d) = {1, 2, 3, 4}levels of decisionrange

X1=D1= {xϵU:d(x) =1}={x3}

X2=D2= {xϵU:d(x) =2}={x2,x4,x6, x7}

X3=D3= {xϵU:d(x) =3}={x1, x5}

$\dfrac{U}{D}$ ={X1, X2, X3} equivalence collection classes= {X_3^1,{ x2,x4,x6, x7},{x1, x5}}

Based on three collection of X1 and X2 and X3 obtain the high and low approximation for all three sets. It should be noted that A is defined as following:

$$A = \{a_1, a_2, a_3, a_4\}$$

$$\frac{U}{IA} = \frac{U}{A} = \{\{x1\}, \{x2\}, \{x3\}, \{x4\}, \{x5\}, \{x6\}, \{x7\}\}$$

$$\underline{A}X = \left\{x \in U \Big| \frac{x}{A} = [x] \subseteq x\right\}$$

$$\underline{A}X_1 = \{x3\}$$

$$\underline{A}X_2 = \{x2, x4, x6, x7\}$$

$$\underline{A}X_3 = \{x1, x5\}$$

Resolution Matrix (to reduce)

Table: 6. resolution Matrix

U	X1	X2	X3	X4	X5	X6	X7
X1							
X2	a1,a2,a3,a4						
X3	a1,a2,a3,a4	a1,a2,a3,a4					
X4	a1,a2,a3,a4	λ	a1,a2,a3				
X5	λ	a1,a2 ,a3	a1,a3,a4	a1,a2,a3,a4			
X6	a1	λ	a1,a2,a3,a4	λ	a1,a2,a4		
X7	a1,a2,a3	λ	a2,a4	λ	a1,a2,a3,a4	λ	

$$Red_1(A) = \{a_1, a_2\}, Red_2(A) = \{a_1, a_4\}, Red_3(A) = \{a_1\}$$

1.According to the AX_1 category can be concluded that mentioned respondents that in this collection are sure that organizational transparency is at the low level also factors affecting the level of organizational transparency is low. Also according to the AX_1 can be expressed that among the mentioned respondents in this category people who state that organizational transparency is at the low level and the factors affecting organizational transparency is probably in low level.

2. According to the AX_2 category can be expressed that mentioned respondents in this collection are sure that the staff organizational transparency was at the average level and the factors affecting organizational transparency is still at an average level. On the other hand it can be said that with regard to AX_2 collection can be stated that among the mentioned respondents in this category are person who argues that the organizational transparency is in average level and the factors affecting organizational transparency is also at an average level.

3. In AX_3 category can be stated that the mentioned respondents in this category are completely confidence that staff organizational transparency at a high level and the factors affecting staff organizational transparency is also at high level. On the other hand, it can be stated that with regard to the AX_3 collection that among the mentioned respondents in this category are people who have stated that staff organizational transparency is at high level and the factors affecting staff organizational transparency is also at a high level.

Decision rules

Table: 7.: decision rules

IF a1=1,a2=1,a3=1,a4=3 THEN Result=1
IF a1=2,a2=2,a3=2,a4=1 THEN Result=2
IF a1=2,a2=2,a3=2,a4=3 THEN Result=2
IF a1=2,a2=3,a3=3,a4=2 THEN Result=2
IF a1=1,a2=2,a3=1,a4=2 THEN Result=2
IF a1=3,a2=3,a3=3,a4=2 THEN Result=3
IF a1=3,a2=1,a3=3,a4=1 THEN Result=3

According to reduction data and also reduction table can describe the d = 1 by indicating a1 = 1 that is called the reduction value.
IF a1=1 THEN Result=1
So if the actual data on a quantitativelevel, then organization transparency will be at the quantitative level. Using similar reasoning can be summarized above 7 rules as following:
IF a1=1, a2=1 THEN Result=1
IF a2=2, a4=2 THEN Result=2
IF a1=3, a3=3 THEN Result=3
The second method that is how to act with intransigence, is to remove those objects that are accuracy coefficient and low accuracy. According to **[Table -3] t**his time, we have:
X1=D1={x3, x9}
X2=D2={x2, x4, x6, x7, x10}
X3=D3={x1, x5, x8}
In addition, for collection of equivalence classes than conditional features of A, that is U/I , we have:

$$\frac{U}{IA} = \frac{U}{A} = \{\{x1\},\{x2\},\{x3\},\{x4\},\{x5\},\{x6\},\{x7\},\{x8,x9,x10\}\}$$

As well as to high and low approximate for each of conceptual or preliminary categories of D_i , according to theconditional features in A, for $i = 1,2,3,4$ by definition we have:

$$\underline{AD_i} = U\{Y \in \frac{U}{A} \mid Y \subseteq D_i\}$$

$$\overline{AD_i} = U\{Y \in \frac{U}{A} \mid Y \cap D_i \neq \varnothing\}$$

Therefore:

$\underline{AD_1} = \{x\,3\}$

$\underline{AD_2} = \{x\,2, x\,4, x\,6, x\,7\}$

$\overline{AD_3} = \{x\,1, x\,5\}$

And

And

And

$\overline{AD_1} = \{x\,3, x\,8, x\,9, x\,10\}$

$\overline{AD_2} = \{x\,2, x\,4, x\,6, x\,7, x\,8, x\,9, x\,10\}$

$\overline{AD_3} = \{x\,1, x\,5, x\,8, x\,9, x\,10\}$

Using below images, shows the equivalence classes.
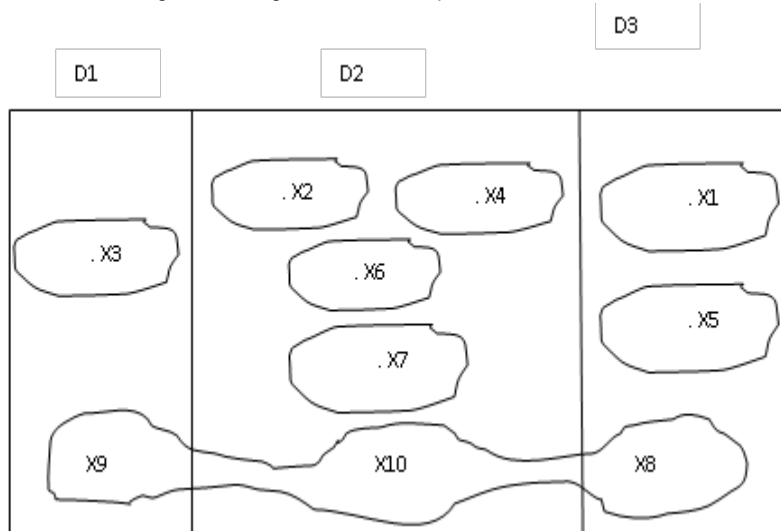
Fig: 2. equivalence Classes

………………………………………………………………………………………………………..

As noted, removed the Incompatible elements by a low accuracy coefficient.

Table: 8. computational table of accuracy coefficient

row	D_i	$\underline{AD_i}\,\overline{D}_{i}$	$\underline{\gamma}(D_i)$	$\overline{\gamma}(D_i)$	$\gamma(D_i)$
1	{ x3,x9 }	$\{x\,3\}, \{x\,3, x\,8, x\,9, x\,10\}$	$1/10$	$4/10$	$1/4$
2	{x2,x4,x6,x7,x10}	$\{x\,2, x\,4, x\,6, x\,7\},$ $\{x\,2, x\,4, x\,6, x\,7, x\,8, x\,9, x\,10\}$	$4/10$	$7/10$	$4/7$
3	{ x1,x5,x8}	$\{x\,1, x\,5\}, \{x\,1, x\,5, x\,8, x\,9, x\,10\}$	$2/10$	$5/10$	$2/5$

So X8, X10 will be deleted.

Table: 9. Table Decision

U	Actual information=a1	Employee participation=a2	Responsiveness=a3	Secrecy=a4	Organizational transparency=d
X1	3	3	3	2	3
X2	2	2	2	1	2
X3	1	1	1	3	1
X4	2	2	2	3	2
X5	3	1	3	1	3
X6	2	3	3	2	2
X7	1	2	1	2	2
X9	1	1	3	2	1

Minimal set of features

Since the decision variable (d) has 3-position (high, medium, low) So we can set minimum construction, respectively, respondents who have rated 1 to the decision variables have to put in one category, respondents who rated 2 to the organizational transparency have to put in one category, respondents who rated 3 to the decision variables have to put in a one category. The 3 creating category are called equivalence class's decision.

$$X1 = \{X \in U \,|\, d(X) = 1\} = \{x\,3, x\,9\}$$

$$X2 = \{X \in U \,|\, d(X) = 2\} = \{x\,2, x\,4, x\,6, x\,7\}$$

$$X3 = \{X \in U \,|\, d(X) = 3\} = \{x\,1, x\,5\}$$

Based on three categories of X1 and X2 and X3 obtain high and low approximation for all three categories. It should be noted that A is defined as the following category:

$$A = \{a_1, a_2, a_3, a_4\}$$

$$\frac{U}{IA} = \frac{U}{A} = \{\{x\,1\}, \{x\,2\}, \{x\,3\}, \{x\,4\}, \{x\,5\}, \{x\,6\}, \{x\,7\}, \{x\,8\}\}$$

Matrix resolution (to reduction)

Table: 10. Matrix resolution

U	X1	X2	X3	X4	X5	X6	X7	X9
X1								
X2	a1,a2,a3,a4							
X3	a1,a2,a3,a4	a1,a2,a3,a4						
X4	a1,a2,a3,a4	λ	a1,a2,a3					
X5	λ	a1,a2 ,a3	a1,a3,a4	a1,a2,a3,a4				
X6	a1	λ	a1,a2,a3,a4	λ	a1,a2,a4			
X7	a1,a2,a3	λ	a2,a4	λ	a1,a2,a3,a4	λ		
X9	a1,a2	a1,a2,a3,a4	λ	a1,a2,a3,a4	a1,a4	a1,a2	a2,a3	

$$Red_1(A) = \{a_1, a_2\}, Red_3(A) = \{a_1, a_4\}$$
$$Red_2(A) = \{a_1, a_3\}, kev(A) = \{a_1\}$$

Decision rules Table: 11. Decisions making rules

IF a₁=1,a₂=1,a₃=1,a₄=3 THEN Result=1

IF a₁=1,a₂=1,a₃=3,a₄=2 THEN Result=1
IF a₁=2,a₂=2,a₃=2,a₄=1 THEN Result=2
IF a₁=2,a₂=2,a₃=2,a₄=3 THEN Result=2
IF a₁=2,a₂=3,a₃=3,a₄=2 THEN Result=2
IF a₁=1,a₂=2,a₃=1,a₄=2 THEN Result=2
IF a₁=3,a₂=3,a₃=3,a₄=2 THEN Result=3
IF a₁=3,a₂=1,a₃=3,a₄=1 THEN Result=3

According to reduction data and also reduction table we can describe the d = 1 by indicating a1 = 1 that is called the reduction value.

IF a1=1 THEN Result=1

So if the real information is on the qualitative level, then organizational transparency will be at the qualitative level. Using similar reasoning can be summarized8 above rule as follows:

IF a1=1, a2=1 THEN Result=1 $\quad = a_1(x) = 1 \,{}^{\wedge}_{\&}\, a_2(x) = 1 \to d(x) = 1$

IF a2=2, a4=2 THEN Result=2 $\quad = a_2(x) = 2 \& a_4(x) = 2 \to d(x) = 2$

IF a1=3, a3=3 THEN Result=3 $\quad = a_1(x) = 3 \& a_3(x) = 3 \to d(x) = 3$

According to decision information systems or **[Table–3]**. can be draw tree diagram of the decision rule for the entire decision rules (including incompatible rule) as follows
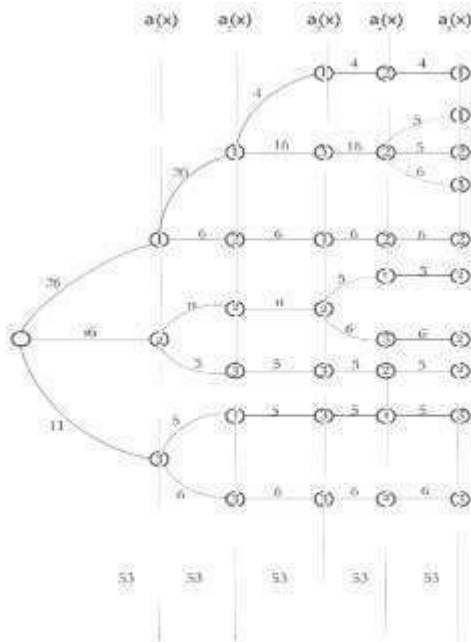
Fig:3. Tree diagram based on the frequency of observations

....

Up to now had been the custom that among the inconsistent rule or conflicting objects, had maintained a support vehicle and will be removed others. But we recommend that don't remove inconsistent rule, but ranked or validated with one criterion or a meature of the empirical validity based on the relative frequency, the observations known as M (R (x)) or an experimental probability measure Pr (R (X1)). And significant differences between these experimental validations for inconsistent or conflicting rule be examined by the proportions test.

In addition, take into consideration that in general, rather than conditional feature of A category, using frokalt category for example, $\emptyset \neq B \subseteq A$. For simplicity, suppose that: $B = A = \{a1, a2... ak\}$.

Then a decision rule in a general form as:

$$R(x) = ((\wedge_{j=1}^{k} a_j(x_1) = \gamma_i) \Rightarrow (d(x) = r))$$

Then:

$$M(R(x)) = M((\wedge_{j=1}^{k} a_j(x) = \gamma_i) \Rightarrow (d(x) = r))$$

$$= \frac{1}{N}\{(\sum_{j=1}^{K} F^*\left(a_j(x) = \gamma_i\right) + F(d(x) = r)\}$$

$$-\frac{1}{N^2}\{(\sum_{1 \le j_1 < j_2 \le k} [F^*\left(a_{j_1}(x) = \gamma_{j_1}\right) \times F^*(a_{j_2}(x) = \gamma_{j_2})]$$

$$+\sum_{j=1}^{k}(F^*\left(a_j(x) = \gamma_i\right) \times F(d(x) = r)$$

$$+\cdots+ (-1)^k \frac{1}{N^{k+1}}\left\{\left[\prod_{j=1}^{k} F^*(a_j(x) = \gamma_i)\right] \times F(d(x) = r)\right\}$$

where $F(d(x) = r)$ and $F(a_j(x) = \gamma_i)$ nespectively shows the frequencies
Of experimentally observed events $\left(a_j(x) = \gamma_i\right)$ and $d(x) = r$

In addition:

$$F^*\left(a_j(x) = \gamma_i\right) = F(a_{j(X)} \neq \gamma_i = N - F(a_j(x) = \gamma_i)$$

also, N shows the total since of data. In addition, the measure of experimental probability based on the relative frequency of experimental is expressed as:

$$P_r\left(R(x)\right) = \frac{M(R(x))}{\sum M(R(x))}$$

These values have been calculated for the data in **Table- 3** and are mentioned in below **Table-12**:

Table: 12. Table of inference decision rule and the size and the probability distribution rules

R(x) F^*	$R_1(x) = \gamma_i$	$\&a_2(x) = \gamma_2$	$\&a_3(x) = \gamma_3$	$\&a_4(x) = \gamma_4$	$\Rightarrow d(x) =$	r	M(R(x))	ρ_r(R(x))
$R_1(x)$	1	1	1	2		1	0/9747	0/1001
$F^*(R_1)$	27	28	43	16	9			
R_2	1	1	3	2		1	0/9214	0/0946
$F^*(R_2)$	27	28	21	16	9			
R_3	1	1	3	2		2	0/9523	0/0978
F_3^*	27	28	21	16	27			
R_4	1	1	3	2		3	0/9337	0/0959
F_4^*	27	28	21	16	17			
R_5	1	2	1	2		2	0/9898	0/1017
F_5^*	27	36	43	16	27			
R_6	2	2	2	1		2	0/9982	0/1025
F_6^*	37	36	42	43	27			
R_7	2	2	2	3		2	0/9989	0/1026
F_7^*	37	36	42	47	27			
$R_8(x)$	2	3	3	2		2	0/9870	0/1014
F_8^*	37	42	21	16	27			
R_9	3	1	3	1		3	0/9932	0/1020
F_9^*	42	28	21	43	17			
R_{10}	3	3	3	2		3	0/9878	0/1014
F_{10}^*	42	42	21	16	17			
							9/7370	1

The second approach toward the decision rule as a Bayesian view. For this purpose, prepare and drawing the following Contingency **Table-13**.

Table: 13. Table of Reconciliation

(1)Contingency table a1 × 3

$a_1(x)$		1	2	3	Sum
	1	9	11	6	26
	2	0	16	0	16
	3	0	0	11	11
	Sum	9	27	17	53

(2) Contingency table a2 × 3

d(x) a2(x)	1	2	3	Sum
1	9	5	11	25
2	0	17	0	17
3	0	5	6	11
Sum	9	27	17	53

(3)contingency table dx(a3 × 3)

d(x) a(x) a3(x)	1	2	3	Sum
1	4	6	0	10
2	0	11	0	11
3	5	10	17	32
Sum	9	27	17	53

(4)contingency table (a4 × d) d (x)

d(x) a(x) a4(x)	1	2	3	Sum
1	0	5	5	10
2	9	16	12	37
3	0	6	0	6
Sum	9	27	17	53

Now, using the contingency table can be written:

$$p_r[(dx) = (r|a_1(x) = \gamma_1 \& a_2(x) = \gamma_2 \& ... + a_k(x) = \gamma_k)$$

$$= \frac{p_r(d(x) = 1)}{\prod_{j=1}^{k} p_r(a_j(x) = \gamma_j)} \left\{ \prod_{j=1}^{k} p_r(a_j(x) = \gamma_j | d(x) = r) \right\}$$

For example:

$$p_r(d(x) = r)a_1(x) = 1\&a_2(x) = 1\&a_3(x) = 3\&a_4(x) = 2$$

$$= \frac{1}{p_r(a_1(x) = 1) \times p_r(a_2(x) = 1) \times p_r(a_3(x) = 3) \times p_r(a_4(x) = 2)}$$

$$\times p_r(d(x) = 1) \times p_r(a_1(x) = 1|d(x) = 1)$$
$$\times p_r(a_2(x) = 1|d(x) = 1)$$
$$\times p_r(a_3(x) = 3|d(x) = 1)$$
$$\times p_r(a_4(x) = 2|d(x) = 1)$$
$$= \frac{1}{\frac{26}{53} \times \frac{25}{53} \times \frac{32}{53} \times \frac{37}{53}} \times \frac{9}{53} \times \frac{9}{26} \times \frac{9}{25} \times \frac{5}{32} \times \frac{16}{37}$$
$$= \frac{(53)^3 \times 9^3 \times 5}{(26)^2 \times (25)^2 \times (32)^2 \times 37 \times 26 \times 25 \times 32} = \frac{1137645}{(1.600768)^{10}} = 0.000071$$

Also:
$$p_r((d(x) = 2)|a_1(x) = 1\&a_2(x) = 1\&a_3(x) = 3\&a_4(x) = 2)$$
$$= (10.252704)\frac{37}{53} \times \frac{11}{27} \times \frac{5}{27} \times \frac{10}{27} \times \frac{6}{27} = 0/032433$$

As a result:

$$p_r(d_x = 3|a_1(x) = 1\&a_2(x) = 1\&a_3(x) = 3\&a_4(x) = 2)$$
$$= (10.252704)(\frac{17}{53} \times \frac{6}{17} \times \frac{11}{17} \times \frac{17}{17} \times \frac{12}{17} = 0.530139$$

As a result:

$$p_r(d_x = 3|a_1(x) = 1\&a_2(x) = 1\&a_3(x) = 3\&a_4(x) = 2)$$

To calculate and compare.

CONCLUSION

Based on the obtained results, if transparency of information is at a qualitative level, organizational transparency will be at a qualitative level. Therefore, organizations should be verifiable and understandable their actions and decisions for interested individuals or groups to the organization's actions or decisions.

In current research, the results showed that, aspects of employee participation and secrecy are in the average level and are effective of organization transparency, In addition, the results showed that, responsiveness increase employee organizational transparency. So, transparency requires responsiveness and transparent organizations should be accountablefor their actions, speech, and decision, so this information in order to review is available to others.

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ARTICLE   **OPEN ACCESS**

A STUDY ON THE SATISFACTION FACTORS IN DESIGNING THE STUDENTS HOUSE: A CASE STUDY OF BOYS DORMITORY CAMPUS OF THE UNIVERSITY OF GUILAN

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ABSTRACT

The current study, relying on humanistic and ecological psychology, aimed at evaluation of environmental satisfaction factors between undergraduate boy students residing in the dormitories of Guilan University and the predictive power these factors for using in architectural designing of further developments of the dormitories in this environment. The research method is correlation and the main data collection instrument is questionnaire. The statistical society of the study is all the boy undergraduate students of Guilan University (940 students) from which 290 students were chosen using simple random sampling. The data were analyzed through the inferential statistical procedures such as correlation coefficient and stepwise regression, using SPSS. The results indicated that the variables self-esteem and respect had the highest effect on environmental satisfaction of the students. Other factors affecting this satisfaction, in order of priority are physiological needs, belonging and love, Psychological safety, and growth needs. Cognitive and aesthetic needs do not play any roles in creation of residential satisfaction in the campus dormitories of Guilan University.

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INTRODUCTION

The students dormitories are one of the man-made environments which are usually made for accommodation of the students entering university from other cities, facilitated for their welfare and development. However, many of these buildings do not have the environmental quality and the majority of students residing in them are dissatisfied with their living environment. Increase in stress and behavioral problems, despair, anxiety, and depression are among the negative effects dissatisfaction with life with consequences such as reduced spirit of social partnership, cooperation and social trust. Therefore, paying attention to satisfaction of students living in dormitories is an important step in designing students' dormitories. Since there are no proper studies in this regard in the country and Iranian society, the research on this issue is so vital.

Theoretical Frameworks of the Study (Concepts and the related Theories)

The two humanistic and ecological approaches were chosen since, besides distancing from fail algebraic and possibility-oriented approaches, pay special attention to the human needs in achieving their satisfaction.
Humanistic Psychology relies on principles such as respect for individual values, lack of prejudice to the other accepted methods, and interest for discovering new aspects of human behavior. It is also willing to coexist with other schools of psychology and tries to, through dialogue with them, take step for completing the psychology [1].
In short,humanistic psychology is about discovery of the human potential and contribute to its growth [2]. Concepts "need" and "satisfaction" are among the fundamental concepts of Humanistic Psychology. Ecological psychology was introduced by Roger Barker and Herbert Wrigh was in Kansas [3]. In this regard, reviewing the impacts of the environment on people's social behavior was of interest to researchers. Also this fact grabbed the attention that not only does man affect the environment for solving his problems, but also he affects others who share this environment with him [4].

ARCHITECHTURE

Satisfaction:

One of the indicators of mental health is life satisfaction level [5, 6, 7]. Experience of happiness and life satisfaction is the overriding goal of life and feelings of sadness and unhappiness is often an obstacle to individual tasks [8]. In other words, the higher the levels of life satisfaction, the higher the general and mental health [9]. Dissatisfaction with life is correlated with poorer health conditions, depression, personality problems, inappropriate behavior and poor social health [10]. The scholars and researchers have provided some theories for determination of the factor affecting satisfaction. "needs satisfaction theory" is among the most important theories in this regard [11, 12].

Needs:

The theory derives from the idea that the behavior's energy, direction, and stability is a result of needs [13]. Needs create motivation and motivation gives direction and purpose to the behavior [14, 15]. Thus, the behaviors also come to action for satisfying the needs [4]. Need is a mode of tension associated with "dissatisfaction", related to a requirement (biological, psychological or social) directed to a category of satisfying objects the leads the person to finding a satisfactory balance, through the acquisition of objects belonging to a given category [16]. Satisfying the human needs is the claim of numerous architects, environmental designers, and urban designers. Maslow (1987), the humanistic psychologist, offers a model of human needs and motivations that is considerable. The studies and research in the field of environmental psychology and architectural theory approves his model to be used in architectural and urban designs [17].

Maslow's Hierarchy of Needs:

Maslow is perhaps the most famous theorists in the field of need. He believed that the basic biological needs are associated with shortages and higher needs with growth [13]. Maslow proposed a hierarchy of needs from the strongest to the weakest with the priority of stronger needs over the weaker ones. He proposed his hierarchy is as follows: Physiological needs, like hunger and thirst; safety requirements, such as security and protection against physical damage; belonging and love, such as membership in social groups and emotional needs; need for respect (self-esteem), i.e. the person is prized by himself and others; the need for self-actualization, which expresses the desire to satisfy individual capacity; and cognitive and aesthetic needs, such as the desire to know and feel the beauty for Beauty [18]. Maslow's believed these needs are instinctive and he meant that they have a perceptible hereditary factors. However, these needs are easily delayed by learning, cultural expectations, fears and opposition. According to Maslow, higher needs are less essential for survival and satisfying them could be delayed [19].

Maslow's hierarchy of needs is one of the most viable theories in Behavioral Sciences, it has a high face validity. In addition, a lot of research have tested Maslow's hierarchy of needs and have supported this model [for example: 20, 21, 22]. Reiss and Havercamp retested Maslow's hierarchy of needs in 2005 using the precise research methods and provided evidence to approve it [23].

Environment:

In psychology, the idea that only acts emanate from the needs is no longer accepted. The current stance is that the needs lead to preparation [13]. Whether these preparations lead to action or not, depends on the environmental conditions. So we cannot assume satisfying the individual's needs inseparable from the environment and the social context in which one person is living. Theories of organisms do not accept one-sided descriptions (environment→human) and emphasize on the human dialectics instead [24]. In dialectics mode, the human affects the environment and accordingly environment affects human [2]. The result of human-environment dialectic is an ever-changing composition by which the environment supplies the human needs and create new motivations for him [2]. so, on one hand human is affected by the environment and on the other hand, he organizes the environment and change its conditions according to his needs and objectives [15]. Maslow defines the bad social and environmental conditions as follows:

"The bad social or environmental conditions are those in which the personal satisfaction (the needs derived from shortcoming) is low to the extent that not everybody can satisfy his needs but in the cost of losing other needs" [25].

Barker, the founder of eclogical psychology also argues that a "behavior setting" enables the individual to achieve the "satisfaction" [26]. These behavior settings have two basic elements namely a typical pattern of behavior and a physical environment [27]. Human states and behaviors, in turn, are formed from interaction between the motivation and capabilities of the environment. So, in this case also it is the interaction between the environment and human needs which can lead to satisfaction.

Student Dormitories:

In the dormitories, the students may share a room with total strangers. In addition, the dormitories should facilitate both studying and socializing - activities that are often at odds [3]. Both individual and group activities should be considered in the dormitories. In many cases, these requirements interfere with each other and cause a confusing and undesirable spaces. The existence of many functions in the bedrooms/study room may lead to some confusion and limit controlling the personal spaces and areas which lead to devastating effects on satisfying the students needs. This can be exacerbated by the increasing of the number of students in a room. During Jefferson's era when the Dormitory was designed, quality was based on human proportions and scales, however today these traits are not of a great importance. The condition of the room where the student lives is fundamental related to a sense of safety, privacy, and social identity of student [28]. Outside area of the dormitory campus also performs several functions at the same time. The most important task of the outside area is providing commuting routes as well as mechanisms for proper building and path tracking. In addition, the natural environment as well as individual and group spaces must be especially considered.

INTRODUCTION OF THE CRITERIA, MATERIALS AND METHODS

Physical Comfort:

Human dissatisfaction is partly related to the lack of comfort [29]. Biological motivations is largely rooted in physiological states of the body. Such motives are many, such as hunger, thirst, sexual desire, thermoregulation, sleep, avoiding pain, and the need for oxygen [19]. The built environment is expected to provide an accepted level of physical welfare. The built environment must consider the sufficient light, temperature, and humidity. In addition, the access routes and attention to infrastructure, facilities, health and medical facilities as well as provision of services deal with satisfying these needs [30]. It seems there are needs that should be considered by most of building types. At the same time, some buildings are expected to pay special attention to physical needs. In dormitory environments, the need for sleep and rest and also food needs as well as the hunger, are among the most important needs. Among the effects of sleeplessness, inconsistencies in performance and increase in task performance time can be noted [31]. Failure in satisfying this important physiological need can cause serious damage to the student's school performance and dropout. Student residences usually satisfy the food and hunger needs in many different ways. One of these ways is the use of dining halls that accept the students at certain hours, however on the other hand, students often do not follow a strict time schedule or on different situations, may be awake all night and involve in their favorite social interaction. That's why there is a constant need for a place for small eating and gathering spaces as well as a mini fridge and small kitchen.

Way-finding

The mental and social aspects of way-finding are important factors for a sense of personal security [18]. Way-finding in a completely different environment is easier than an environment in which all the things are similar. The visual clarity refers to the extent to which the various parts of the environment can be seen more distinguished from the rest of it. The high visual clarity can ease the way-finding. The spatial designs complexity indicates the volume and difficulty in the information that should be processed for moving inside an environment [3]. Fear and uncertainty that is resulted from poor way-finding and security and pleasure which is obtained through its opposite, relates the environment shape to deep psychological level [32]. Urban and architectural maps and simbols are good iconic factors for enhancing people's way-finding ability [18].

Privacy, Personal Space, Territorial Behavior:

Rapoport (1982) defines privacy as "the ability to control social interaction, right to choose, and the ability of individual's desirable social interaction" [33]. One of the main reasons for dissatisfaction with the built environment, is failing to meet the desired level of privacy. The need for privacy, personal space and territorial behavior is common in the humans and is related to satisfying other needs such as safety, self-actualization, and self-esteem [34, 35, 36]. If someone else enters Personal Space people feel perturbed and show their dissatisfaction [34]. Even if external signs of dissatisfaction remain hidden, such reactions to the disturbances, skin redness may occur. In work situations, this perturbation disrupts the tasks [37].

Noise and Crowd:

Disturbing noise is called "crowd", and if the sound is loud and persistent it imposes damage to human hearing system [38]. The noises can lead to physiological and psychological stress [39]. In the students' dormitories, the noisy spaces such as hallways and dining rooms must be separated from the bedrooms/study rooms in which the silence is very important. Abundant sources of noise in the dormitory are created by the sounds and steps of students, especially in corridors, stairways, bathrooms. Outside noise and sounds caused by equipment like plumbing repairs, ventilation and cleaning of the devices may also disturb the students [28].

Personalization and the Personalized Space:

Personalization is said to be the marking, or the integrity and consistency of objects in a location that gives us the feeling of ownership of that place [refer to 40].Personalization of places provide a lot of purposes, such as Psychological safety, the symbolic aesthetic, and matching the environment with the needs. Most important of all, the spatial domain is distinguished by personalization [41]. Students often do not feel responsible for the dormitories environment, however when freedom of choice goes higher, the responsibility level increases and they show more participation. Hansen and Altman in a study (1976) showed that the amount and type of decoration used in rooms is related to the possibility of the student staying in the university [42]. Eigenbrod's study also found similar results [cited in 40].

Territorial Behavior and Human Territories Typology

Altman describes three types of territories as primary, secondary and public. Primary territories are under the ownership and exclusive use of the individual and special groups and others know them as the owner of this territory. In fact, no such territories, or the inability to regulate the access of others to it, in the long term can cause loss of self-esteem or self-identity [36]. Oscar Newman believes the human territories include personal space, private space, a semi private / semi-public and public space and introduces the lack of clear spatial territories as the cause of many abnormal behaviors and unsafe spaces [43].

Student dormitories are a kind of residential buildings in which the residents' satisfaction is heavily influenced by controlling the spatial territory. Creating distinct territories for two roommates is difficult, since room furnishings will be established in such a way that makes access to areas of room uncontrollable and often it is not clear that each spatial territory belongs to which resident [41]. Vander Ryn and Silverstein, in a study on the dormitories of University of Berkley noted a similar problem. In this study, 94% of the population demanded more freedom of dormitory space to create their own territory [44].

Social Needs:

Satisfying the need to connect has a lot of positive consequences and leads to life satisfaction and happiness [19]. Several researchers believe that need to attachment and tend to interpersonal belonging is Component of basic human motivation. It is said that this need is defined with a frequent interaction within communication range [13].

One of the most important roles of dormitories is deciding on the size and composition of the group in which the student finds himself. Impact of these groups on shaping the minds is more than impact of the professors and even family. A study shows that students' sense of belonging is correlated with their participation in university activities (r=0.65). This indicates that daily interactions is important [45]. If the group is too large or heterogeneous, the student will be lost in a mass and will be looking for smaller, more intimate groups (Some people do not find such a group and lose most effective educational experiences that the university can offer) [28].

Natural Environment and a Sense of Belonging to the Place:

The natural environment is a biological necessity [46] has a strong impact on the relationship between people and the built environment which is determined as a choice setting [47]. The natural environment is important in creating a sense of belonging and identity, which in turn has positive effects on mental health [48]. The amount of greenery and wildlife, tree size and their density are positively associated with satisfaction in the environment [49]. A natural environment can increase the amount of

contact by people in the external environment and strengthen the sense of community [50]. The research confirms that a person experiences of nature should not certainly be visible. Even the most ordinary aspects of nature as a tree or a small open space can also be enjoyable [51, 52].

Need for Growth and Competence:

The basic assumption of the theory of growth is that human is not born with fully grown abilities. For adapting and success, they must develop their abilities [13]. Maslow, in the high level of human talents and abilities growth, notes to the value of "being". There are approximately fourteen values of being, including truth, beauty, goodness, Forgiveness, perfection, simplicity, comprehensiveness, and several other values [25]. While the built environment can provide potential features for growth of low level talents and competence needs, it seems development of values of being in this way is difficult. However, in cases where the built environment can provide symbols and signs for the spiritual tasks and values, it can have a reminders role [53].

In student dormitories, considering the proper educational facilities as well as passionate and animated spaces can be effective on creating multiple capabilities according to the characteristics and merits of dormitory students.

Dormitory plays an important role in the education process of students. Some universities hold the formal classes in their dormitories and benefit from e-learning tools in order to improve the education. Stokes (1960) determined that 55 to 78 percent of students study in dorm rooms and 85% of students prefer to study alone [3]. As a result, having a private space is a high priority among students [44]. Since dormitories, in addition to being workplace (learning), is students' home, these spaces are usually equipped with entertainment and amazement places. These facilities can have an important role in the development of students' physical and social talents.

Aesthetic Needs:

The aesthetic information address a specific part of our spirit and lead to a sense of satisfaction in us [54].Traditional designing of environment deal with the symbolic and formal aesthetic [18]. The subject of formal aesthetics is values of the environment shapes and structures. The symbolic aesthetics deals with the pleasure created by people's mental history and attitude made of configurations and features of the built environment [18]. Detection of these meaning, consciously or unconsciously, affects people's feelings about themselves and the environment.In addition, the identity of the symbolic meanings of the built environment increase the people's sense of belonging to a social group or a location [33].

Review of Related Literature:

While there are research in the field of environmental needs of the students, but it seems such studies have no place in Iran so far. Eigenbrod's study evaluates the effect of territory control personalization on the satisfaction and behavior of the students. More freedom was significantly related to the satisfaction of the people with their roommates. Also, in those places, less demolition, more decorations in halls, less disciplinary problems and better maintenance of the dormitory building was seen. Becker concludes that having a territory is correlated with a large number of positive outcomes for students, such as more satisfaction, less crowd, less environmental damage, and less disciplinary problems [cited in 40]. In another study Baum, Gatchel, Aiello, and Thompson (1981), investigated the pressure of congestion in student dormitories. In short, they found the trace the role of environmental, social and cognitive factors in the development of congestion pressure, isolation and helplessness [55]. In Baum, Aiello and Calesnick (1978) study, long corridor and short corridor dormitory residents who live in large groups and temperate, were evaluated by survey at weeks 1, 3, 7. The results showed that after one and three weeks of stay in long corrdir dormitories, the residents of this dormitories were more competitive, more passive, and more involved in the reinstatement of their control compared to short-corridor dormitories residents. At the end of the seventh week, they withdrew more and were less involved in their interaction, and showed signs of failure [56]. Valins & Baum (1973) [57] and Baum & Valins (1973) [58] are important in that they considered the long-term effects of living in crowded areas on the upcoming social behavior. The results show that living in crowded environments is associated with avoiding social interaction.

Data Gathering by Questionnaire

In this study, firstly the pretest questionnaire was distributed among the students in Guilan University boys' dormitories. Cronbach's alpha coefficient for all inferential statements were within acceptable limits. However, some of the questions that respondents were unclear about were modified or omitted.

Sample Size and Sampling Method:

In the current study, the probable accuracy was taken as d=0.05 along which the Z value is 1.69. Considering the symmetric mode for the main variable measured which is the satisfaction of the dormitory, we accept 50 to 50 gap in determining the sample size. So, the p=q=0.5. By putting the mentioned values in the following equation, the sample size is obtained:

$$n= \frac{N.pq.z^2}{Nd^2 + z^2.pq}$$

Since The statistical population of the study is all the boy undergraduate students of Guilan University (N= 940 students), The sample size obtained. (n= 273)
Given that some of questionnaires might be partially filled, 290 questionnaires were copies and randomly distributed among the students in Guilan University1 boys' dormitories.

RESULTS

Data Description:

In this section, the main independent and dependent variables are described by sub-variables (measures) that constitute the questionnaire's items. The following variables define the operational structure of the research determined by library study, observation, and interview. It is worth mentioning either of the environmental needs is associated with numerous environmental issues factors. On the other hand the number of items in the questionnaire should be in manner that respondents carefully and properly respond to them. For this reason, those sub-variables that are most important in description of variable has been selected.

Table: 1. Description of the responds to the items of physiological needs

Items		Very low	low	Moderate	High	Very high	Mean
Proper temperature	Frequency	34	73	129	41	5	**2.7**
	Percentage	12.1	25.9	45.7	14.5	1.8	
Proper natural light	Frequency	19	50	125	76	10	**3.0**
	Percentage	6.8	17.9	44.6	27.1	3.6	
Rest and sleeping	Frequency	57	82	98	30	14	**2.5**
	Percentage	20.3	29.2	34.9	10.7	5.0	
Proper and sufficient paths inside the dorm	Frequency	18	53	120	82	8	**3/0**
	Percentage	6.4	18.9	42.7	29.2	2.8	
Proper and sufficient paths outside the dorm	Frequency	9	34	97	118	24	**3.1**
	Percentage	3.2	12.1	34.4	41.8	8.5	

Table: 2. Responds to the safety (psychological) needs items

Items		Very low	low	Moderate	High	Very high	Mean
annoying noise from the surrounding environment	Frequency	1	24	40	117	99	**4.0**
	Percentage	0.4	8.5	14.2	41.6	35.2	
Disturbing noise from inside the room	Frequency	35	80	78	56	33	**2.9**
	Percentage	12.4	28.4	27.7	19.9	11.7	
Specifying the personal spaces and communal spaces	Frequency	77	95	85	23	1	**2.2**
	Percentage	27.4	33.8	30.2	8.2	0.4	
specifying routes and corridors in the	Frequency	7	36	120	103	15	**3.3**

		Very low	low	Moderate	High	Very high	Mean
design of interior spaces	Percentage	2.5	12.8	42.7	36.7	5.3	
specifying routes and corridors in the external design	Frequency	3	36	104	122	17	3.4
	Percentage	1.1	12.8	36.9	43.3	6.0	

Table:3. Description of the responds to the sense of belonging and being loved needs

Items		Very low	low	Moderate	High	Very high	Mean
Trees and green space outside	Frequency	6	25	80	130	40	3.6
	Percentage	2.1	8.9	28.5	46.3	14.2	
plants and flowers indoors	Frequency	70	43	78	71	20	2.7
	Percentage	24.8	15.2	27.7	25.2	7.1	
Providing relations of friendship and intimacy in dormitory spaces	Frequency	33	80	103	51	14	2.8
	Percentage	11.7	28.5	36.7	18.1	5.0	
attention to the symbolic and memorable spaces and elements in the design of the external enclosure	Frequency	104	106	51	15	5	2.4
	Percentage	37.0	37.7	18.1	5.3	1.8	
attention to the symbolic and memorable spaces and elements in the design of the internal enclosure	Frequency	156	83	24	14	5	2.4
	Percentage	55.3	29.4	8.5	5.0	1.8	

Table: 5. Description of the responds to the self-esteem and respect needs

Items		Very low	low	Moderate	High	Very high	Mean
The ability to control disturbing noise from surrounding	Frequency	102	109	51	15	4	2.0
	Percentage	36.3	38.8	18.1	5.3	1.4	
The ability to control disturbing noise from inside	Frequency	29	56	96	73	28	3.1
	Percentage	10.3	19.9	34.0	25.9	9.9	
The power of choice and decision-making in laying out the furniture	Frequency	88	67	66	50	11	2.4
	Percentage	31.2	23.8	23.4	17.7	3.9	
The power of choice and decision-making in decorating the room	Frequency	40	83	81	62	16	2.8
	Percentage	14.2	29.4	28.7	22.0	5.7	

Table: 5. Description of the responds to the self-actualization needs

Items		Very low	low	Moderate	High	Very high	Mean
Freedom and choice about reading and studying	Frequency	71	86	76	44	5	2.4
	Percentage	25.2	30.5	27.0	15.6	1.8	
Spaces for recreation or sport	Frequency	47	65	120	41	8	2.6
	Percentage	16.7	23.1	42.7	14.6	2.8	

Table: 6. Description of the responds to the cognitive and aesthetic (formal) needs

Items		Very low	low	Moderate	High	Very high	Mean
aesthetically pleasing forms	Frequency	156	86	31	8	1	**1.6**
	Percentage	55.3	30.5	11.0	2.8	0.4	
Spaces for privacy and pondering	Frequency	81	79	65	46	5	**2.6**
	Percentage	28.7	28.0	23.0	16.3	3.9	

Table: 7. Description of the responds to the satisfaction elements

Items		Very low	low	Moderate	High	Very high	Mean
Outside area	Frequency	33	75	130	35	9	**2.7**
	Percentage	11.7	26.6	46.1	12.4	3.2	
Inside area	Frequency	80	127	63	9	3	**2.0**
	Percentage	28.4	45.0	22.3	3.2	1.1	
Room	Frequency	72	94	83	21	12	**2.3**
	Percentage	25.5	33.3	29.4	7.4	4.3	
Your dormitory corridors and paths	Frequency	52	92	115	21	1	**2.4**
	Percentage	18.5	32.7	40.9	7.5	0.4	
Feeling secure in the dormitory complex	Frequency	44	57	103	62	16	**2.8**
	Percentage	15.6	20.2	36.5	22.0	5.7	
Intimate communal spaces	Frequency	12	33	103	104	30	**3.4**
	Percentage	4.3	11.7	36.5	36.9	10.6	
General services spaces	Frequency	60	93	103	22	4	**2.4**
	Percentage	21.3	33.0	36.5	7.8	1.4	
Satisfying your needs	Frequency	54	105	106	13	4	**2.3**
	Percentage	19.1	37.2	37.6	4.6	1.4	
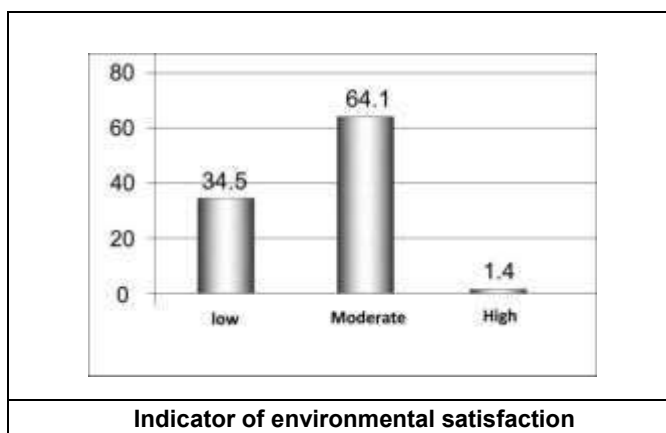
Group frequency	Frequency	Percentage
Low	97	34.5
Moderate	180	64.1
High	4	1.4
Total	**281**	**100.0**

Indicator of environmental satisfaction	**Grouping of environmental satisfaction indicators**

Inferential Findings:

for analysis and interpretation of the research hypotheses, firstly the relationship between the secondary variables as well as main variables is evaluated, i.e. what is the relationship between each of the six groups of the

mentioned needs and satisfaction (Hypotheses one to six). Pearson Correlation Test was used for this purpose. Next, through the comparative analysis, the ability of each independent variable in predicting the satisfaction rate was evaluated. For this purpose multivariable regression method in stepwise mode has been used.

Table: 6. The results of the relationship between variables Pearson correlation test

Independent variable	R coefficient	p_value	N	Result of hypothesis testing
Physiological needs	0.456	0.000	278	**Approved**
Need for security	0.371	0.000	278	**Approved**
Need for a sense of belonging	0.371	0.000	278	**Approved**
Need for self-esteem and resect	0.458	0.000	280	**Approved**
Need for self-actualization	0.429	0.000	280	**Approved**
Aesthetic needs	0.357	0.000	281	**Approved**

Table: 7. Evaluation of the ability of independent variables in predicting the satisfaction level

Regression levels	Independent variable	β coefficient	t-value	Sig.t	R	R²
First step	Self-esteem	0.460	8.49	0.000	0.460	0.209
second step	Self-esteem	0.371	7.19	0.000	0.578	0.329
	physiologic	0.361	7.01	0.000		
Third step	Self-esteem	0.344	6.76	0.000	0.606	0.360
	physiologic	0.304	5.77	0.000		
	A sense of belonging	0.194	3.72	0.000		
Fourth step	Self-esteem	0.307	5.96	0.000	0.623	0.379
	physiologic	0.274	5.92	0.000		
	A sense of belonging	0.168	3.21	0.001		
	safty	0.161	3.04	0.003		
Fifth step	Self-esteem	0.273	5.12	0.000	0.633	0.390
	physiologic	0.255	4.81	0.000		
	A sense of belonging	0.130	2.40	0.017		
	safty	0.143	2.71	0.007		
	Self-actualization	0.134	2.33	0.020		

Stepwise regression test results are summarized in the table. The findings suggest that regression has gone up to 5 steps. In the fifth step, the variables self-esteem, psychological, sense of belonging, security and self-actualization are entered into the equation which are mentioned in order of the highest ability in predicting satisfaction.

DISCUSSION AND CONCLUSION

In this study, the strength of independent variables (6 factors of Maslow) in predicting the environmental satisfaction of students residing in Guilan University dormitories was evaluated through stepwise regression.
The results showed that the variables self-esteem and respect had the highest effect on environmental satisfaction of the students (β=0.273). since this variable was evaluated with the sub-variables (measures) controlling the disturbing noises of surrounding environment as well as the noises from inside the room and also territory controlling by personalization and power of selection in rooms decoration, it can be concluded that the current study supports the studies of Eigenbrod's (1977) [40] and Hansen and Altman (1976) [42]. The physiological needs satisfaction had the second role in environmental satisfaction of the students of Guilan University (β=0.255). So, the dormitories, in this environment, must pay enough attention to the students' physical comfort

through the existence of natural light and proper temperature, facilities for enough rest and enough sleep, adequate roads and access routes, etc.

The third need with a significant effect on environmental satisfaction of the students is the sense of belonging and loved (β=0.130). It seems the social interactions is the most important factor in satisfying this need. In addition, other variables such as the relationship with the natural environment and the presence of symbolic and memorable elements are among other important factors in satisfying this vital need. The ranking of other needs for reaching the environmental satisfaction are safety (psychological) (β=0.143) and self-actualization (β=0.134). The cognitive and aesthetic (formal) needs did not affect the creation of satisfaction in students residing in the dormitories of Guilan University.

It is suggested, the prediction power of each sub-variables of dormitory environment needs be evaluated in further studies in order to obtain more precise results for designing. Also, in the environments with both corridor and suite style dormitories, a comparative study between the two can reveal the advantages and disadvantages of each, more precisely.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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ARTICLE   OPEN ACCESS

IDENTIFICATION AND CLASSIFICATION OF ADMINISTRATIVE SYSTEM DAMAGES AFFECTING THE PERFORMANCE OF IRANSHAHR MEDICAL SCIENCES ORGANIZATION

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ABSTRACT

The aim of this study is to identify the damages affecting the administrative system of Medical Sciences organization of Iranshahr. The study statistical population includes all employees of Iranshahr University of Medical Sciences that their number is 2100. To determine the sample size, 325 persons were selected as samples from Morgan – Krejcie Table. The method is simple random sampling. The measurement tool is questionnaire of factors affecting the administrative health. The questionnaire has 21 questions that its validity is confirmed by experts, managers and then the supervisor. To obtain the items' reliability, Cronbach's alpha was used which was 0.88 showing a good reliability. To analyze the data, SPSS ver. 19 is used. The results of this study indicate that economic, political, administrative, and social factors have the highest impact in reducing damages on the performance of Medical Sciences organization of Iranshahr to reduce administrative system damages, respectively and therefore it can be said in reverse that among these factors, social, administrative, political and economic factors have the greatest impact on administrative damages in improving the administrative performance of Iranshahr Medical Sciences Organization.

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INTRODUCTION

After the Islamic Revolution and raising the issues of reforming structure of administrative and government organizations and the need for public participation in activities and provision of public services, once again attention to the theory of dividing state exercise to sovereignty and tenure as a base and certain pre-assumption has been evident in the country's administrative reform programs [1].

Low labor productivity will lead to the failure of the organization. Given that human resources is a key factor in organizational success, the impact of organizational culture on employees' behavior and therefore their performance has been confirmed in many studies [2].

Since the primary or main factor to reduce or increase the organization productivity is its human resources, so one of the things that will involve managers of leading organizations in the coming decades, will be the effort to increase job productivity [3].

Today, the administrative structure is independent governmental organizations that are out of the direct subordination of the Ministry based on the principle of specialty and administrative requirements and the need for a technical and administrative decentralization, and usually have a specific budget and separate organization are created under various titles such as organization, institution, corporation, center or company. [4] The goal of establishing these types of administrative institutions, is granting more freedom of action and liberation of complex regulations and centralized administrative hierarchy and sometimes the need for administrative decisions as a group, so that organizations which nature of work and mission require greater flexibility and speed in decision making and action, will be able to do their tasks properly [1].

One of the factors effective in the successful development and implementation of development programs is efficient administrative system, in other words, the government's view to administration and management of country, given the significance and position of the administrative system in economic, political, social and cultural

structures and realization of social macro goals, regardless of the logical, coherent and appropriate administrative system, achieving this position and role is not practical. Accordingly, various countries seek to reform the administrative system and do greater efforts in this regard, and in general, the key to the development is a coherent and efficient administrative system. For this reason, plans for evolution in the government administrative system is specially considered by policy makers, institutions and international organizations. So that the condition for receiving many international aids is countries joining the administrative - political reforms in the state. Therefore, the administrative system reform to create an environment for the advancement of economic, social and cultural development plans is an undeniable necessity [5].

But complexity, failure or lack of laws, wide and unaccountable bureaucracies, public ignorance of their rights, lack of access to information, lack of morality, financial poverty and lack of consistency of noncommissioned staff salaries with the costs are among the reasons that make bribery and corruption to be a means to escape from these problems [6] and [7]. However, the administrative system of each country is as the regulator of all activities to achieve the set objectives that while creating harmony between the different parts, provides a suitable ground for solving the problems of people and facilitating the flow of public affairs. The administrative system consists of components such as human resources, organization, systems, methods and procedures, laws, facilities and resources that have a mutual and organic relationship and directs the society to achieve its goals and ideals. Precise understanding this system, the principles of society and internal and environmental conditions ruling over it can help us in explaining the stepped goals and its strategies as well as development of implementation plans and paves the way to identify the structural obstacles to the administrative system. [8] and [9].

Hence, the need for administrative system development is felt more than ever, but the design of optimal administrative system requires a review of the status quo and identifying its major problems and challenges. [10]. In this respect, after the implementation of a development plan and lack of access to its objectives, to explore the causes of failure, we should not just look for flaws, weaknesses and errors in the program and search the solution of the problem of unattainable program goals in itself, but also the structure of development program should be studied. In addition, the administrative factor of the program i.e. administrative system should also be considered, because it happened many times that the best development program has failed by incompetent executives and unhealthy administrative system and has implemented inconsistent with the objectives of the program. So we decided to identify and rank the administrative system damages affecting the improvement of performance of Medical Sciences Organization of Iranshahr in this study.

Difficulties and obstacles of administrative system
In this part, it is tried to describe and express some of the key features of the administrative system in the Third World and bottlenecks resulting from them so that expressing the characteristics and problems, will be an entry to resolution of the problems of administrative system in the countries.

Imitating nature of institutional structures, organizations and management
One of the features of the third-world administrative system is the imitating nature of its administrative structures that will cause many problems. The basic pattern of organizations in these countries is an imitation of the advanced industrial countries and has no genuine structure for the organization and comprehensive management. All of these countries, even those that are not under colonial domination, tried to use foreign structures in their administration. These countries, with a precarious structure, has welcomed the development and has speculated if the West has been able to develop with such a model, with the help of these structures, they will witness development [6].

Incompatibility of imported administrative system with special cultural conditions in developing countries, has caused not only administrative system in these countries don't meet their basic and indigenous needs, but also it faces many difficulties and challenges, which getting rid of it, requires time and effort. Extensive research of scientists in the field of management, including, Hofstede, shows the fact that the management and organization is strongly influenced by culture and management styles and collective goals are affected by international differences of work values. One of the underlying issues that in transferring Western models should be considered by developing countries - especially ancient countries with an accumulated rich culture - (such as India, China, South Korea, Turkey and Iran), is that this transfer should take place within their indigenous culture. Therefore, baselessness of the administrative structure and its imitating nature of management system, is mostly associated with features such as despotism, elitism, aloof and paternalistic. The important thing is: a model should be selected that while facilitating the understanding, is enough consistent with reality.

Low productivity and ineffectiveness of administrative system
The effectiveness and efficiency of administrative systems in developing countries than developed countries, is at a low level. One reason is the inconsistency of Western administrative system with cultural and value condition of developing communities.

Another reason is the weakness of specialty or lack of effective use of experts. In these countries, there is very little skilled manpower and the present experts are not used properly in right place. Chronic unemployment and deficiency are seen in government offices very much. It is said that in industrialized countries, the efficiency at working hours is 80 to 85 percent, while in developing countries the figure is less than 20 percent. In some developing countries, people dependency to a certain class or group or party, is among the undeclared condition of access to jobs and this has caused many professionals to be set aside and face lack of specialists. Lack of enough incentive for government officials and lack of attractiveness of administrative bodies are among the main causes that have led low efficiency of administrative system of these countries. Due to lack of effective employee performance evaluation systems, control, payroll, reward and punishment, caused a very low efficiency.

Disalienation in the newly independent countries has also increased the specialized gap. At the beginning of independence, political leaders are interested or forced to replace foreign experts immediately, with local staff and do the mission despite financial losses. [6]

One of the organizational managers in Nigeria, has described this step as, "the political leaders took the decision. They believed that English officers must immediately be replaced with native ones, even if it creates abnormalities. In their opinion, political independence was not possible without administrative autonomy, and politically, at this stage, there was no way for coexistence between local and foreign experts."

Non-merit system in human resources management

In non-merit system, organizations in the appointment and promotion of staff, are not bound by rules and regulations and factors such as family and acquaintances, influential officials order, dependence on high levels of organization and affiliation to political officials are basis for employment. In such circumstances, human resources management in the organization is subject to individual tastes and there is no rule. In addition, the use of bureaucracy to attract influential people and enlist their support, is another aspect of non-merit.

"Any change in the political regime or at the cabinet will result in the dismissal of officials who are not supported by the new political leader. In addition, government officials, because their positions are required for appointing new people, will be fired and after dismissal, may remain in the payroll list of department or ministry without undertaking a specific task. This way, will result in extending bureaucracy, especially in high levels." Exorbitant training costs, laziness, low work quality and low level of effectiveness of any institution, is partly due to the wrong and excessive choice. [6]

In our country, the Supreme Administrative Council, recommended by the [former] Management and Planning Organization, to increase productivity and efficiency of human resources and improving the management of executive systems and establishing the proper system for selection and appointment of specialist and committed managers and stabilizing the management and increase employee motivation for job promotion, approved the regulations for selection, appointment and replacement of managers in the areas of "inclusive circle", "selection criteria", "the process of selection, appointment and change" and "job organization".

Administrative corruption

Administrative corruption, is commonly referred to diversion of legal methods and generally illegitimate use to the status and position and is appeared as various forms, one of which is bribery. Complexity, insufficiency or lack of laws, large and unaccountable bureaucracies, public ignorance of their rights, lack of access to information, moral weakness, financial poverty and lack of consistency of noncommissioned staff salaries with the costs are among the reasons that lead bribery and corruption to be a means to escape from this problem. More importantly, in the advanced industrial countries, various tools are used to control bureaucracy. However, authoritarian systems in some developing countries, are free of many of the controls. This condition causes - regardless of whether or not the system is authoritarian - bribery be the dominant form of interaction between

citizens and public authorities. Currently, in our country, experts consider one way of fighting administrative and financial corruption as accountability of organizations that this requires auditing and supervision of all organizations. Public sector accountability is based on the assumption that the decisions and actions of brokers always affect the economic, political, social and cultural affairs strongly. However, accountability in today's society is emphasized differently, in the general sense, it refers to the processes by which citizens, make rulers responsible for their behavior and performance. This is often done through elections, and empowers the people's representatives in parliament to make political leaders and government officials accountable through oversight and audit mechanisms. Political directors keep the subordinate officers from the hierarchy of authority and responsibility and also courts and administrative tribunals also keep executives accountable before the law. Accountability is the foundation of any society that claims to be democratic. This statement may be expressed oppositely and with more intensity. The requirement for democracy is to have a proper accountability system. Government agencies are established by citizens, and for them and should be accountable before them. The relationship between citizens and government can be likened to the client / lawyer relation because in fact, the citizens accepted others to be in charge of society, but they must ensure that their needs and demands are taken into consideration. Romzek presents a model that based on it, accountability to the political, legal, organizational and professional types are distinguishable. [6]

Research questions
Main question
What are the administrative systems damages affecting the performance improvement of Medical Sciences Organization of Iranshahr?

Secondary question
Which damage is most effective in the administrative system of Medical Sciences Organization of Iranshahr?

MATERIALS AND METHODS

The study is applied research in terms of type and descriptive based on how to obtain desired data and because the desired data are collected through sampling of the community to investigate the distribution of characteristics of population, this research is survey. The study is applied in terms of nature and method. The statistical population included all employees of Medical University of Iranshahr and they are 2100. The number of samples is estimated 325 according to Morgan table (Cochran formula). Sampling is done using simple random sampling method. The data required for experimental section of this study, is collected through hospital visits and distributing questionnaires, and theoretical foundation information are collected by going to the library and databases. To assess the validity of study tool, its validity was first confirmed by experts, managers and supervisors. The reliability of the questionnaire was measured using Cronbach's alpha. This means that 30 questionnaires were distributed among the population and then Cronbach's alpha was equal to 0.88. High alpha is a sign of high validity of questionnaire and its reliability. To analyze the data in this study, descriptive and inferential statistics are used, so that in inferential statistics, the test in accordance with data such as regression and Friedman will be used.

RESULTS

In this section, we discuss the research questions and test hypotheses.
Main question
What are the damages of administrative systems effective in improving the performance of Medical Sciences Organization of Iranshahr?
To answer the main research question, one-sample t-test was used. In this test, the mean obtained for each of the components, is compared with the mean bound i.e. number 3. If the hypothesis of high mean of variables mentioned of number 3 is confirmed, the main hypothesis is confirmed. The results are summarized in **[Table- 4, 5]**.

Table: 1 . Results of the first hypothesis test

Variable	Mean	t-statistics	Degrees of freedom	Significance level	Lower bound	Upper bound
Administrative factor	3.14	3.53	324	0.000	0.0615	0.2165
Political factor	3.15	3.69	324	0.000	0.0669	0.2199
Economic factor	3.25	6.108	324	0.000	0.1706	0.3328
Social factor	3.16	3.98	324	0.000	0.0799	0.2364

According to the **table-1** above, since the significance level for each of the components of administrative, organizational and political factors, economic factors and social factors of organization is less than 5% error level, and also lower and upper limits are positive, it can be inferred that the mean of these variables have a statistically significant difference with the mean value (number 3). So we can say that reducing administrative system damages effective in improving performance for all components, are more than average; as a result, administrative, political, economic, social factors are effective to reduce administrative system damages and the situation of these factors is positive in improving the performance of Medical Sciences Organization of Iranshahr.

Secondary questions
First question: Which damage is most effective in administrative system of Medical Sciences of Iranshahr?
To answer the first question, Friedman test was used. The results of this test are summarized in the following **[Table-2]**.

Table 2 - Friedman test results

Number	325
Chi-square statistic	9.822
Degrees of freedom	3
Level of significance	0.020

According to Friedman test results, since the significance level obtained for the test (0.020) is less than acceptable error level (0.05), we conclude that at 95% confidence level, the level of priority of reducing administrative systems damages affecting performance are significantly different from each other. The results of prioritization of the components of reducing administrative systems damages effective in improving performance are given in the **Table-3** below.

Table: 3. The results of prioritization

Priority	Components	Mean ratings
First	Economic factor	2.68
Second	Political factor	2.48
Third	Administrative factor	2.47
Fourth	Social factor	2.38

According to the **table-3**, economic, political, administrative, and social factors have the highest impact in reducing damages of administrative system on the performance of Medical Sciences of Iranshahr, respectively and so it can be reversely said that among the mentioned factors, social, administrative, political and economic factors have the highest impact on damages to administrative system on the performance of the Medical Sciences of Iranshahr.
Is reducing administrative systems damages effective in improving the performance of medical sciences different between men and women?

Independent t test was used to check the above question. In this test, the mean obtained for the component of reducing effective administrative system damages were compared between men and women and results are summarized in **Table- 4**.

Table: 4 . Results of independent t- test

Variable	Sex	Mean	t-statistic	DoF	Significance level
Administrative factor	Male	3.13	-0.181	323	0.856
	Female	3.15			
Political factor	Male	3.11	-1.409	323	0.160
	Female	3.24			

Economic factor	Male	3.22	-1.499	323	0.135
	Female	3.36			
Social factors	Male	3.16	0.218	323	0.827
	Female	3.14			

Because the significance level for all variables is greater than the error level 5%, it can be said that reducing damages of administrative systems affecting the performance of medical sciences is different between men and women.

How is the relationship between each of the variables of reducing damages of administrative system affecting the performance of medical sciences organization?

To examine the relationship between each of the variables of reducing the damages of administrative systems affecting the performance of Medical Sciences Organization, Pearson correlation coefficient was used. Results are given in **Table- 5**:

Table: 5 . Pearson correlation coefficient

| Confidence dimensions | Administrative factor | |
	Pearson correlation coefficient	Significance level
Political factor	0.335	0.000
Economic factor	0.416	0.000
Social factors	0.430	0.000

As seen in the table above, the correlation between the organization's administrative factor and political, economic and social factors of organizations is 0.335, 0.416 and 0.430, respectively that is a relatively average and positive relationship and it is significant at 0.05 level. As a result, there is a relationship between organization's administrative factor and political, economic and social factors of the organization.

Table: 6 .Pearson correlation coefficient

| Confidence dimensions | Political factor | |
	Pearson correlation coefficient	Significance level
Economic factor	0.401	0.000
Social factors	0.123	0.027

As seen in the **Table-6** above, the correlation coefficient between political factor and social and economic factors is 0.401 and 0.123 respectively that is a relatively average and positive relationship and is significant at 0.05 level. As a result, there is a relationship between political factors and economic and social factors of the organization.

Table: 7 . Pearson correlation coefficient

| Confidence dimensions | Organizational economic factor | |
	Pearson correlation coefficient	Significance level
Social factors	0.301	0.000

As seen in the table above, the correlation coefficient between the economic factor and the social factor is 0.301 which is a relatively average positive relationship and is significant at 0.05 level. As a result, there is a relationship between the economic factor and social factor of organizations.

DISCUSSION AND CONCLUSION

In relation to the main research question "what are the effective damages of administrative systems in improving the performance of Medical Sciences Organization of Iranshahr?" the results show that reduced damages of administrative systems effective in improving performance for all components, is more than average; as a result administrative, political, economic, and social factors are effective in reducing damages of administrative systems and situation of these factors is positive in improving the performance of Medical Sciences Organization of Iranshahr.

The results of this study and the results of study by Mir Mohammadi and Hassanpour entitled "the administrative system of Iran: an analysis of the problems and challenges" showed that problems of administrative system can be studied in seven sectors: human resource management; structure, processes, procedures, laws, regulations, administrative culture and service; management models and practices, innovation and continuous improvement, IT and evaluation given its components that the main issues is related to human resource management and on the other hand, major challenges of Iran administrative system include lack of rule of careerism, inefficiency of regulatory system, lack of rule of continuous improvement thinking and spirit of scholarship and inefficient organizational structure.

In relation to the secondary questions that "Which damage in the administrative system of Medical Sciences Organization of Iranshahr is most effective?" The results show that economic, political, administrative and social factors have the highest impact in reducing damage of administrative system on the performance of Medical Sciences Organization of Iranshahr and so it can be reversely said that from among the mentioned factors, social, administrative, political, economic factors have greatest impact on administrative damages in improving the administrative performance of Medical Sciences Organization of Iranshahr.

The results of this study are complied with the results of DaneshFard and AsadullahZadeh entitled "barriers to the realization (implementation) of reforming public sector's management systems plan, leadership and training management which is done aiming to determine the causes of failure to achieve the plan for reforming management systems according to objectives of executive policies of evolution programs in governmental systems and showed that the barriers related to human resources are the most serious causes of failure to achieve the reform plan of management systems.

Recommendations

According to the results of the main research questions that reducing the damages of administrative systems effective in improvement of performance of Iranshahr Medical Sciences including all the administrative, political, economic and social factors, it is suggested:

1- To create the perfect atmosphere for organizational staff freedom to express opinions
2- Serious attention and commitment of senior managers to the issue of fighting administrative corruption
3- Trying to establish meritocracy policies in the appointments and promotions of organization

According to the results of the research secondary question that the first rank is related to the economic factor of organization, the second rank to the political factor, third is related to the administrative factor and the fourth is related to social factors, it is suggested:

1- Attention of senior management to removing to corruption-prone plans (corrupting)
2- Establishment of an effective incentive mechanism to pay salaries and incentives to staff
3- Creating accurate and transparent policies on economic estimates of the organizations

Proposals for future researchers

1- Similar studies in other city agencies and departments in different provinces
2- Review of the effect of organizational effective and independent judiciary and disciplinary system to improve performance

Review of the effect of self-monitoring attitudes among staff to improve organizational performance.

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CIVIL PROJECT MANAGEMENT IN COST AND DURATION REDUCTION WITH PRIORITIZATION OF SUITABLE CONSTRUCTION WORKSHOP ARRANGEMENT

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ABSTRACT

With the increasing advance and development of industry, more facilities and equipment have been made for construction industry and civil works, which as a consequence of these advanced equipment and facilities, the conduction of large and more complicated civil projects is now possible. On the other hand, with the increase of size and complexity of civil projects, the need for safety and reserving the environment and finding ways in order to reduce accidents in construction workshops is felt more than ever. With an accurate and systematic planning for suitably arranging the construction workshops, aside from providing more various factors involved with projects, the operational costs can be reduced while also the environment is preserved. In this project, using the TOPSIS analysis method, we have assessed and prioritized the equipment and facilities placement according to the norms of duration, environment and cost in construction workshops so that the consequent issues are minimized. Based on the analyses, the norms of environment, cost and duration are orderly prioritized and it is necessary for the projects that the workshop is equipped according to these factors to consider the safety, accessibility, project planning, total budget, projects location and duration of work as the main priorities so that workshop equipment be lucrative.

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INTRODUCTION

One of the important concepts influencing the quality advantage of civil engineering projects is accompanied with cost reduction in construction workshops and workshop equipment. This concept may have a significant direct or indirect effect on human resources capabilities and also on utilization and effectiveness of the required resources of projects. Because with a decent workshop equipment, a suitable process can be guided and become systematic, however, a bad equipment can result in disturbance, dailiness and wasting the available workshop resources. The purpose of civil workshop placement is to identify, select and determine the temporary and necessary tools and equipment for conducting different constructive operations, determination of size, shape and the dimensions of equipment and finally placing them in the most efficient location inside or near the workshop at the duration of project conduction [1]. In order to present a method for construction workshop placement design, one of the methods can be inspiration from the former presented methods and combining them [2]. Zouein and Tommelein has proposed a method for dynamic placement of construction facilities. They attempted to create a sequence of placement during the life cycle of the project have tried to optimize placement by using linear planning and addressing the cost reduction caused by transportation and moving the facilities and equipment [3]. For the first duration, optimization of constructive operations in terms of safety and the effect of safety on workshop site design were investigated by Anumba and Bishop. In 1989, Farrel and Hover have studied the use of a software for suitable placement of cranes in construction workshops with the purpose of preventing the accidents caused by cranes [4]. Moreover, in 2010, Said and El-Rayes have considered the safety issues in fundamental structures and have pursued the issue of workshop site placement with the two goals of safety risk and cost reduction, and aside from the temporary fixed equipment, the temporary changeable equipment were also considered by them and they have proposed a dynamic placement model. This evaluation model is consisted of four main stages: [1] risk identification, [2] brightness safety optimization, [3] cost safety optimization, and [4] performance evaluation of the model [5]. Hegazy and Elbeltagi have generated a model based on genetic algorithm for site dynamic placement planning. This model using two dimensional reticulated coordinates are able to work with any disordered shape in the site area and each facility occupies a number of reticulated units based on its size and shape. The main advantage of this model to

other proposed methods is its ability to work with any form of site and its lack of limit in using circular and square shape for facilities [6]. Sanad et al. [7, 8] have proposed a model in which aside from considering the real distance between facilities for minimizing the trip distance, cost were considered more accurately to the concept of safety. With the expansion and complication of civil engineering projects, the need for safety maintenance and finding ways to reduce incidents in workshops and also improving the generative yield accompanied with the need of conserving the environment is felt more than ever. In this study, using the TOPSIS analytic method, we attempted to evaluate and prioritize the tools and equipment placement based on environmental, duration and cost merits in construction workshops so that the consequent issues are minimized. Thus, identification of the effective factors is conducted using the available sources and the experts' opinions.

MATERIALS AND METHODS

Workshop equipment process

Workshop equipment include the activities that are performed before each project conduction [9]. Workshop equipment is of a significant role in the amount of cost, safety and the quality of projects. A decent workshop placement and equipment is enormously effective on the process of project conduction. Thus, considering the effective factors in this area and understanding the priority of these factors can be of a significant contribution to transportation optimization. Moreover, for gaining an understanding of the construction workshop equipment jargons, see [10, 11, and 12].

In each contract, a percentage or an amount of money is paid for workshop equipment. Basically, it is very important to conduct a primitive study on workshop before any executive operation. Generally, the workshop equipment procedure can be divided into different categories as it is shown in **Table- 1** [13 and 14].

Table 1: Workshop equipment process

1)	Understanding the project and its related matters	2)	Design
3)	Provision of executive and preparatory plans for workshop	4)	Preparing the work place
5)	Providing the administrative, well-fare and facilities departments	6)	Procurement and provision of necessary materials
7)	Implementation and execution	8)	Equipment and machineries
9)	Maintenance, safety and health (12)	10)	Human resource provision
11)	Transportation provision	12)	Food provision

Suitable placement in workshops contributes in reduction of pollution and ecological risks and conserving the environment. For instance, air pollution caused by excessive transportation in workshops can be reduced with placement which causes the reduction of transportation and trips inside the workshop. Furthermore, this can help reducing the access routes caused by suitable placement which results in prevention from destructing the natural resources. Generally, a decent and accurate placement of a construction workshop is of great significance as described in **Table- 2**:

Table 2: the importance of suitable placement in construction workshops

1)	Increasing the management level and quality	2)	Reducing the operational costs in projects	3)	Reducing the projects operation duration
4)	Increasing the quality level of workshop product	5)	Increasing safety in workshops	6)	Reducing the trip and transportation in workshops
7)	Reducing the ecological risks	8)	Minimum interruption in workshops	9)	Workers and workshops neighbors health and comfort

Data collection and analysis

A sample is consisted of a set of individuals that are selected from a population in a way that they represent the population's features and characteristics, and they are shown with "n". A sample must be selected in a way that all individuals in a population have an equal chance to be selected. In order to choose such a sample, considering the statistical population features, different method ca be used. This sampling method is called a probability sampling method which is also known as the random sampling method. Observing the probability and the equal chance principle for each member of the population causes the selected sample to be a population's representative which is of scientific value and the samples characteristics are coherent and compatible with the population's features. Thus, this method is used in this study.

Statistical population and sample: since the proposed parameters in this study include a vast area of variables in the field of workshop equipment of civil projects, the statistical population should include expertise, skills and different fields of work related to this current. Nearly 20 experts of design, execution, management and research, distinguished by their experience and their field of work related to the purposes of this study.

Sample volume measuring method: in this study, as the concept of generalizing the results to the population is considered, the probability sampling method were utilized and also, in order to determine the sample volume (n) the Cochran formula (1) were used. In this regard, the statistical population consists of 30 individuals, error level is 5% (95% level of confidence), normal distribution from the table under the normal curve with a confidence level of 95% equals to 1.96 and the volumes of p and q from the previous data and information are replaced with an amount of 5%. This number were resulted as 26.64 for the sample of this study, which is very close to the statistical population and so it is counted as logical.

$$n = \frac{Nt^2 pq}{Nd^2 + t^2 pq}$$

(١)

In the above equation, n: statistical sample volume, N: statistical population volume, t: normal distribution amount, q: the ratio of the lack of feature in the statistical population, p: the ratio of the existence of the feature in the statistical population and d^2: the error level.

Data collection: in this study, the available information and evidences and the interview method were used, also the experts' opinion effecting the construction workshop equipment, 3 main factors of cost, duration and environmental conditions and 12 sub-factors were categorized as shown in Table 3.

Table 3: factors and sub-factors in construction workshop equipment

Environmental merit	Cost merit	Duration merit[1]
Atmospheric conditions	The cost of materials and equipment	Duration of execution
Project's location	Employees costs	Duration of work
Access routes	Management cost	Project planning
Safety	Provision costs	
	Total budget	

the indicator with a positive aspect : X_1

the indicator with a negative aspect X_2
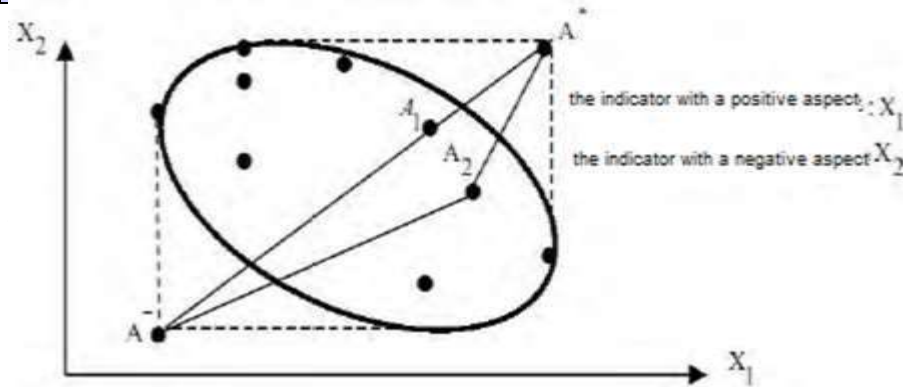
...ution. This technique was first ...tors. The principal logic of this ideal solution is a one which ...vhich has the least distant from ...rpour, 1387]. In other words, in ...he ideal solution gain a higher ...A- are orderly the positive and ...ce to the positive ideal solution

Fig. 1: the targeted space between two indicators of TOPSIS technique

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Generally, the TOPSIS technique has 6 phases or steps that each steps of measurement and prioritization in this technique is presented [16].
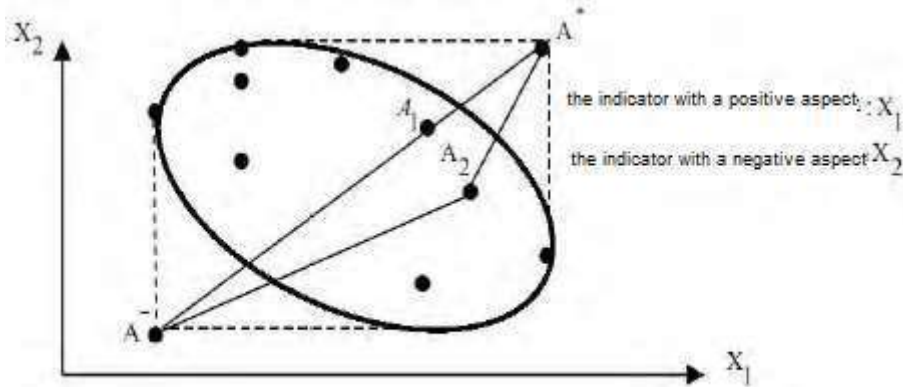
Step 0 – creating the decision matrix:
In the TOPSIS technique, using n indicators, the m alternatives are evaluated. Thus, according to each merit, each alternative is given a point. These points can be according to quantitative and real or based on qualitative and theoretical values. Either way, an n*m decision matrix should be formed according to equation (2) in a way that A_i of the ith alternative, the X_{ij} of the gained numerical value of the ith alternative with the indicator of jth alternative. In this matrix, the merit which is of a positive suitability is the profit indicator and the indicator with the negative suitability is the cost indicator.

Step 1) decision matrix normalization:
Similar to other decision making methods with multiple merits, the decision matrix also needs to be normalized. In this regard, the values of the Vector method is used.

$$D = \begin{matrix} & X_1 & X_2 & & X_j & & X_n \\ A_1 \\ A_2 \\ \vdots \\ A_i \\ \vdots \\ A_m \end{matrix} \begin{bmatrix} X_{11} & X_{12} & \cdots & X_{1j} & \cdots & X_{1n} \\ X_{21} & X_{22} & \cdots & X_{2j} & \cdots & X_{2n} \\ \vdots & \vdots & & \vdots & & \vdots \\ X_{i1} & X_{i2} & \cdots & X_{ij} & \cdots & X_{in} \\ \vdots & \vdots & & \vdots & & \vdots \\ X_{m1} & X_{m2} & \cdots & X_{mj} & \cdots & X_{mn} \end{bmatrix} \quad (٢)$$

This method as opposed to the simple linear normalizing method isscaled up using the equation bellow:

$$r_{ij} = \frac{X_{ij}}{\sqrt{\sum_{i=1}^{m} X_{ij}^2}} \quad (٣)$$

Step 2) formation of the harmonic scaled up matrix:
The next step is the formation of the harmonic scaled up matrix according to the weights of the merits. Thus, it is necessary to primarily calculate the merits weights using a technique such as AHP or Shannon entropy. The weight of each merit is multiplied to its related element. Formation of the harmonic scaled up matrix with the assumption of the W vector as the algorithm's input is determined as the following equations:

$$W = \{w_1, w_2, ..., w_n\} \approx \text{assumed from DM} \quad (۴)$$

$$V = N_D * W_{n*n} = \begin{vmatrix} V_{11}, ..., V_{1j}, ..., V_{1n} \\ V_{m1}, ..., V_{mj}, ..., V_{mn} \end{vmatrix} \quad (۵)$$

Here, N_D is a matrix in which its merits' points are scaled up and comparable and W_{n*n} is a Diagonal matrix which only its main diagram elements are not zero.

Step 3) calculation of positive and negative ideals:

Calculation of PIS and NIS is the next step of the procedure. In this step, for each indicator, a positive ideal (A+) and a negative ideal (A-) is measured. For merits that are of positive weight, the positive ideal is the largest value of that merit and the negative ideal is the smallest value of that merit. Also, for the merits with negative weight, the positive ideal is its smallest value and the negative ideal is its smallest value. For the positive ideal alternative (A+) and the negative one (A-) the following is defined:

$$A+ = \left\{ \left(Max V_{ij} \,\middle|\, j \in J \right), \left(Min V_{ij} \,\middle|\, j \in J' \right) \middle| i = 1, 2, ..., m \right\} = \left\{ V_1^+, V_2^+, ..., V_j^+ \right\} \tag{6}$$

$$A- = \left\{ \left(Min V_{ij} \,\middle|\, j \in J \right), \left(Min V_{ij} \,\middle|\, j \in J' \right) \middle| i = 1, 2, ..., m \right\} = \left\{ V_1^-, V_2^-, ..., V_j^- \right\} \tag{7}$$

$$J = \left\{ j = 1, 2, ..., n \,\middle|\, j \text{ for cost} \right\} \tag{8}$$

$$J' = \left\{ j = 1, 2, ..., n \,\middle|\, j \text{ for cost} \right\} \tag{9}$$

Step 4) calculation of the distance from positive and negative ideals and calculation of the ideal solution:

In this step, the relative closeness of each alternative with the ideal solution is calculated. The Euclidean distance of each positive and negative ideal is calculated using the following formulas:

$$d_i^+ = \sqrt{\sum_{j-1}^n (V_{ij} - V_j^+)^2} \quad for \ i = 1, 2, ..., m \tag{10}$$

$$d_i^- = \sqrt{\sum_{j-1}^n (V_{ij} - V_j^-)^2} \quad for \ i = 1, 2, ..., m \tag{11}$$

Step 5) calculation of the ideal solution or the relative closeness:

In this step, the relative closeness of each alternative with the ideal solution is calculated. For this purpose, the following formula can be utilized:

$$CL_i^* = \frac{d_i^-}{d_i^- + d_i^+} \quad for \ i = 1, 2, ..., m \tag{12}$$

The CL value is between zero and one. The closer this value is to one, the closer the strategy is to the ideal answer and it would be a better strategy. Also, it is observed that if $A_i = A+$, then $d_i^+ = 0$ and then, $CL_i^+ = 1$. And if $A_i = A-$, then $d_i^- = 0$ and then, $CL_i^+ = 0$. Thus, the closer the A_i alternative is to the ideal solution (A+), the closer the value of CL_i^+ to one.

Table 4: Decision matrix (N)

	Cost	Duration	Environmental conditions
Sub-merits	Positive	Positive	Positive
Project planning	7.67	8.30	6
Safety	7	7	8
Material and equipment cost	8.67	6.30	6.30
Employee's cost	8	5.67	5.30
Management cost	8.30	6.30	5.30
Provision cost	8.30	5.67	5.67
Total budget	9	7.333	5.67
Execution duration	6.67	8.67	6
Work duration	7.67	9	5.67
Atmospheric conditions	5.67	6.30	8.30
Project location	6.67	7	8
Access route	7	7.30	8.30

Weight	0.333	0.333	0.333

Step 6) the final step of alternatives ranking:

In the final step, the existing alternatives of the assumed issue can be ranked based on the CL^+_i descending order.

Data processing and induction

According to the mentioned steps that are mostly used in engineering issues in this study, the hierarchical analysis and TOPSIS techniques were used for evaluation, analysis and comparing the results. According to the step 0, the decision matrix of this project is presented in **Table- 4**.

Decision matrix normalization according to step 1 is presented for sub-merits A1 to A15 in **Table- 5**.

Table 5:Scaled up matrix (N1)

	C1	C2	C3		C1	C2	C3		C1	C2	C3
A1	0.26	0.3	0.24	A5	0.28	0.20	0.21	A9	0.26	0.32	0.225
A2	0.24	0.25	0.32	A6	0.28	0.2	0.23	A10	0.19	0.23	0.33
A3	0.29	0.23	0.25	A7	0.3	0.26	0.22	A11	0.22	0.25	0.32
A4	0.27	0.204	0.21	A8	0.22	0.31	0.24	A12	0.24	0.26	0.33

In order to calculate the harmonic scaled up matrix (V), the scaled up matrix (gained from step 2) is multiplied to the square matrix (w_{n*n}) which its main diagram elements are the weights of the indicators and its other elements equals zero. Table 6 shows the harmonic scaled up matrix

Table 6 : The harmonic scaled up matrix (V)

	C1	C2	C3		C1	C2	C3		C1	C2	C3
A1	0.035	0.077	0.07	A5	0.071	0.055	0.053	A9	0.063	0.082	0.057
A2	0.059	0.060	0.077	A6	0.071	0.053	0.056	A10	0.046	0.058	0.081
A3	0.075	0.055	0.066	A7	0.074	0.067	0.056	A11	0.058	0.066	0.077
A4	0.069	0.052	0.056	A8	0.055	0.079	0.06	A12	0.054	0.063	0.085

In the next stage, according to the third step, the alternatives that are identified as the most and least factors are recognized. In other words, for the positive indicators, the positive ideal is the largest value of v and the negative ideal is the smallest value of v. Also, for negative indicators, the positive ideal is the smallest value of v and the negative ideal is its largest **[Table- 7].**

Table 7: The positive and negative ideals of each indicator

Merit	Positive ideal	Negative ideal
Cost	0.078	0.049
Duration	0.083	0.053
Environmental condition	0.085	0.054

Finally, the fourth, fifth, and the sixth steps were conducted as was described in the previous section and the alternatives ranking is conducted according to **Table- 8** and **Figure- 2**.

Table 8 : Alternatives ranking

Rank	Alternatives	Distance to the positive ideal	Distance to the negative ideal	CL
1	A1	0.027	0.034	0.557
2	A2	0.024	0.042	0.636
3	A3	0.044	0.026	0.371
4	A4	0.053	0.023	0.302

5	A5	0.049	0.02	0.289
6	A6	0.046	0.025	0.352
7	A7	0.033	0.037	0.528
8	A8	0.038	0.032	0.457
9	A9	0.036	0.034	0.485
10	A10	0.044	0.033	0.428
11	A11	0.035	0.035	0.500
12	A12	0.026	0.037	0.587

Fig. 2: Alternatives ranking

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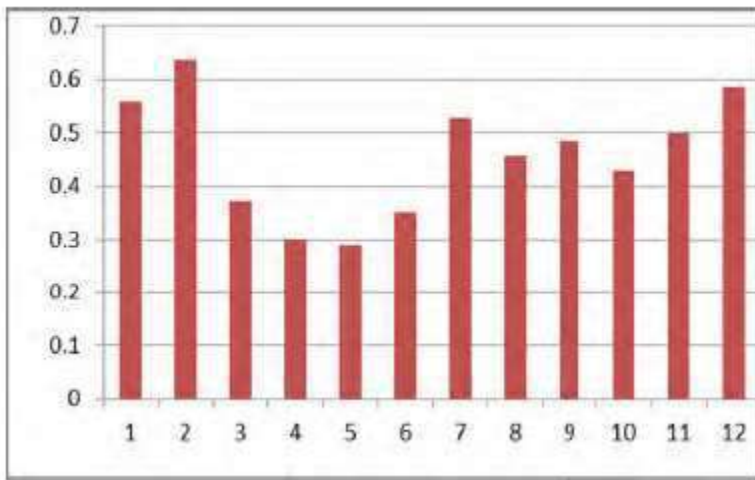
RESULTS

In this study,a model for ranking of equipment placement in civil project sites were presented. Also, the conducted studies on the discussed issue in this research indicates that using a TOPSIS analytic technique for accessing this model is one the main reasons for innovation in this research. Aside from this purpose, after conducting accurate scientific and experimental studies, the important factors in workshop equipment were listed (Project planning, Safety, Material and equipment cost, Employee's cost, Management cost, Provision cost, Total budget, Execution duration, Work duration, Atmospheric conditions, Project location, and access route). According to the analyses, the environmental merits, cost and duration are orderly prioritized and the civil engineers of the projects that are executed according to these workshop equipment factors should prioritize the factors of safety, access route, project planning, total budget, project location, and work duration as the main factors so that the workshop placement and equipment be beneficial in the project conduct. Other factors that are of lower priorities include the execution duration, atmospheric conditions, employees and management cost.

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ARTICLE   **OPEN ACCESS**

THE EFFECT OF SALINITY AND NITROGEN ON GROWTH AND MORPHOLOGICAL CHARACTERISTICS OF DILL

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ABSTRACT

Dill (Anethumgraveolens L.) is an annual and aromatic plant belonging to the umbel variety (Apiaceous) which is used in food and pharmaceutical industries. In order to investigate the interactional effect of salt (NaCl) and nitrogen (NH_4No_3) on the growth and physiological characteristics, an experiment was conducted in 2011 in the faculty of Agriculture, University of Lorestan. It was performed in a factorial design with completely random blocks in six replications and 15 treatments. Seeds of this plant were planted in the pot with a diameter of 25 cm soil containing a mixture of three parts, cultivar soil, sand and manure. In eight leaf - stage, salt treatment (NaCl) at concentrations of 0, 30, 60, 90, 120gr of sodium chloride in per 100 kilograms of soil and ammonium nitrate treatment with different concentrations of 0, 10, 20gr per 100 kg were applied. The results of the variance analysis suggested that increased levels of salinity and ammonium nitrate has a significant effect on the parameters measured (P≤0/01). With increasing salinity levels, relative growth rate, fresh weight and dry, main stem length, fresh and dry weight of shoot and root decreased while applying ammonium nitrate in the shoot and root length, fresh and dry weight of root and shoot, the RGR , dry weight in the root and aerial organs were decreased.

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INTRODUCTION

Salinity stress is one of the most common abiotic stresses that decrease agricultural production in arid and semi-arid lands and use efficiency. According to the Food and Agricultural Organization (FAO), about 300 million hectares of farmland worldwide is under salt stress [1]. Salinity is the accumulation of soluble salts in the soil depth or around the roots of plants, to the extent that it affected the growth and development and leads to death. Although the salt stress can refer to any salt, but usually the purpose of salinity, is concentration of sodium chloride which is the most abundant salt in the nature. According to botanists, salinity stress causes many problems such as water scarcity and physiological drought, morphological changes such as reduced growth, reduced leaf area, fleshy leaves, thick cuticle, changes in the number and size of pores, creating Tyloses, woody roots and shorten plant [2], poisoning of the sodium and chlorine elements [3], impaired absorption of other ions [4] and biochemical changes such as the production of reactive oxygen species [1]. On the one hand, according to many properties of medicinal plants and humans need to use these drugs, effective production of them has always had a great importance. Dill is the among the herbs and nutritional plants that its production for pharmaceutical products, essential oils and health is of great importance. Considering the fact that in Iran, 12 percent of the cultivated land area is affected by salinity close to 50% [5], identification of medicinal plants tolerant to salinity and their increased production efficiency in these areas are essential. In addition, the effect of nitrogen on the growth and root development provides necessary conditions for water uptake and other nutrients and inhibits the excessive loss of photosynthesis process and stomatal conductance under salt stress conditions [6]. Therefore, in this article, with respect to the objectives and assumptions, we investigated the effect of salinity and nitrogen on the growth and physiological characteristics of dill in detail.

Research objectives

1. The effect of salinity on growth and development of physiological characteristics of dill plant.
2. The effect of nitrogen on the growth and development of physiological characteristics of dill plant.

AGRICULTURE

3. The effect of nitrogen on the growth and physiological characteristics of dill under salt stress.

Salinity is effective in the biochemical and physiological of dill plant. Nitrogen is effective in the biochemical and physiological of dill plant. We hope that the results of this research opens the way for future research within the area of botany regarding the optimal production of plant products, particularly pharmaceutical products.

Effect of salinity on seed germination and plant growth parameters

Salinity is generally causes in delayed germination and rate of germination. Depending on the severity of it, salinity can cause lack of germination in some seeds, or delayed germination or weak production in the plants. In germination stage of seed, some plants such as wheat and barley show low tolerance to salinity yet their tolerance is increased at later growth stages [7]. The investigation of the effects of salinity on dill indicates that in the five ds salinity, germination was decreased to 50% and is stopped in 35 dS concentration, and also grain production in salinity five ds was reduced and inhibited at concentration of 28 dS [8]. Through the facilitation of absorption of toxic ions, which alter the activity of certain enzymes and hormones, salinity affects the germination of seeds. These physical and chemical changes result in reduced germination. Salt (sodium chloride) and polyethylene glycol (PEG) both reduce the absorption rate, but the latter is more pronounced [9]. By examining five salinity treatments (100, 75, 50, 25, 0 mM) in the pot, Nooraniazad and Hajibagheri (2008) found that increasing salinity treatments led to reduced leaf area and pot, total dry material and stem length in dill. Several parameters are effective in salt tolerance of plants, including survival rate, plant height, leaf area, leaf damage and their relative growth rate [10]. The most important reason for the study of soil salinity is because it's effect on plant growth and yield and its affiliated parameters. Sodium chloride salinity is the most common types of salinity in the arable soils of Iran which limits the capability to produce many important plants. Species and different varieties of plants show different resistances under the same saline conditions or at the certain stage of growth. The harmful concentration of salt to different plants depends on the salts mixture, soil characteristics, climate, humidity and plant [4]. Tolerance between different species of plants to salinity not only is different but also depends on the environmental conditions. The effect of salinity takes place on carbon accumulation capacity primarily by reducing the level of photosynthesis in the leaf [11]. Because of reduced osmotic potential effect in the root, the absorption of water and minerals is decreased by plant. Also due to a disorder in the process of photosynthesis, the plant growth, leaf, stems length and branches production are reduced [12]. In studies of the tomato plant in salt concentration of 70 and 90 mm, it was shown that, fresh and dry weight of the plant was decreased by increasing the salt concentration.

The effect of nitrogen on plants in saline conditions

Nitrogen is among the factors that are necessary to meet the requirements for the plant [13]. Significant effects of nitrogen in the increased crop yields as well as reduced the amount of soil nitrogen motivated researchers to use nitrogen fertilizers for increased efficiency of their culture. Culture and access to factors, in order to increase the medicinal properties of plants were always considered important for the people involved in the pharmaceutical industry, including the effects of chemical fertilizers such as ammonium nitrate in the quantity and quality of the materials. The treated seeds of an onion with ammonium nitrate or potassium nitrate under salinity stress, its resistance and germination were increased. Salinity, amount of tissue, also reduces the length and weight of roots. In addition to osmotic effect, root to shoot ratio is increased. The growth of greenhouse under salt stress depends on the concentration of nitrogen used. The seeds of many plants and shrubs show higher yields in the presence of nitrates to ammonia [14]. Plant treatment with ammonium nitrate under saline condition increases biomass and plant growth. The effect of nitrate on shoot dry weight and growth is more tangible. Dill has the ability to absorb nitrates from the dry soil, resulting in decreased harvest index and biomass production is increased. Nitrate increases dry weight of leaf and root dry weight while used alone or in conjunction with ammonium. Onion performance significantly increases with the use of nitrogen fertilizers (Urea), as well as leaf and dry weight of onion significantly increases with increasing N rate. Many environmental stresses such as salinity, have an adverse effect on the uptake and assimilation of nitrogen, some studies suggest that salinity reduces absorption and the accumulation of nitrogen in the aerial parts of the plant [15].

MATERIALS AND METHODS

First test
Germination

The first experiment was carried out at temperatures between 15 to 21°C. After preparing healthy and uniform seeds, they were put in 20% sodium hypochlorite solution for 10 minutes, and then were washed with water several times. Then two pieces of filter paper (Whatman) were placed in each Petri dish (diameter 70 mm), and 10 ml of sodium chloride solution at a concentration of 2, 4, 6, 8 and 10 per cent was poured into them.

In order to germinate, Petri prepared were located in a cool place with temperatures below 20 degrees Celsius based on the above method. The number of buds per Petri was recorded at intervals of a day the traits assessed included the following: Germination percentage and speed were calculated through the following formulas: Germination percentage = the total number of germinated seeds until the last day of the counting of 100÷the total number of seeds

Germination speed = germinated seeds ÷first day of counting + the second day of counting + the number of germinated seeds ÷last day of counting

The second test

Dill cultivation

During the winter in 2011 and spring in 2012, a pot experiment in a completely randomized design with 15 treatments, were performed in the greenhouse of Lorestan University (over 90 vases in five kilograms) which every treatment consisted of six pots. In each pot, equal amount of the soil (three-fifths), sand (one-fifth) and urea (one-fifth) was poured. Dill seeds were disinfected with 30% commercial sodium hypochlorite before planting for five minutes, and then were washed with distilled water during three successive stages. 30 seeds were planted in each pot to a depth of three centimeters which were sparse at regular distances in the different stages of plant growth.

The application of different treatments on plants

Seeding was cultivated in early February, approximately 45 days after the plant was reached in eight leaf stage. Salinity treatments and ammonium nitrate were applied. Then, factors such as shoot, root length, leaf number, fresh and dry weight were randomly measured from several pot plants. In Table (2-3) the application of different levels of sodium chloride in the pots was plotted. The numbers presented in Table were obtained by multiplying the treatments product (0, 30, 60, 90, and 120) in 5 divided by 100. The following **Table -3.1** shows that the application of stress is gradually conducted to avoid shock to the plant.

Table: 3.1: Weekly schedule for the application of salinity stress in grams per 100 kg of soil

Treatment	First week	Second week	Third week	Fourth week
Control	0	0	0	0
30g/100kg Soil	1.5	0	0	0
60g/100kg Soil	1.5	1.5	0	0
90g/100kg Soil	1.5	1.5	1.5	0
120g/100 kg Soil	1.5	1.5	1.5	1.5

In **Table- 3.2**, the application of different levels of ammonium nitrate has been plotted. The resulting numbers are derived by the formula.

Table 3.2:Weekly schedule for the application of ammonium nitrate in grams per 5 kg of soil

Treatment	First week	Second week	Third week	Fourth week
Control	0	0	0	0
10g/100 kg Soil	0.5	0	0	0
20g/100 kg Soil	0.5	0.5	0	0

Growth Analysis
In order to study plant growth, the number of 15 plants was randomly chosen from the pot 45 days after treatment. Then their roots and shoots were dried well after washing and their stem, roots, leaves and inflorescence umbrella were calculated in grams

to two decimal points. As well, their length of the stem, branches and roots were calculated in terms of centimeters to one decimal point, and then dry weight. Other developmental parameters were calculated in the following way:

1) Relative growth rate (RGR): unit is gr.Kg-1.d-1.

$$RGR = \frac{\ln W_2 - \ln W_1}{T_2 - T_1}$$

2) In denotes a Nehpri logarithm. W_1 and W_2 are the total dry weights at the beginning and end of the experiment, respectively. T1 denotes the primary time (45 days) and T2 to the secondary time (75 days).
3) The ratio of root dry weight to shoot dry weight is called alometric coefficient which is considered as indicators of water plant.
4) R/S = shoot / root dry weight
5) It is worth mentioning that the statistical analysis of the impact of ammonium nitrate and sodium chloride were carried out separately and together. For this purpose, 9.01 SAS statistical software was used. Mean comparisons were calculated using Duncan's test results listed in the following section.

RESULTS

The first test results
Germination percentage changes in different treatments of NaCl
The results of this study showed that increasing concentrations of NaCl decreased the germination and reduced early seedling growth of plant so that these changes were significant at one percent level. In the salinity treatment, the highest germination percentage (68%) in the control group and the minimum germination (zero) in a 10% concentration of salt (sodium chloride) were observed, respectively.

Changes in germination rate in different treatments of NaCl

Increasing the concentration of NaCl in the experimental groups reduced the rate of germination in the plant, so these changes were significant at the %1 probability level. The highest germination rate (35/03%), and the lowest germination rate (zero percent) were observed in the control group and 10% NaCl, respectively. In ammonium nitrate treatment, the highest germination rate (35/03%) was observed in the control group with zero concentration and the lowest germination rate (zero percent) was observed in the treatment groups at a concentration of 10% ammonium nitrate.

The average length of root and shoot
After 10 days, the average length of root and shoot was measured. The maximum root length (4.3cm) in the control group (with zero-percent concentration of sodium chloride), and the minimum length of root (zero) in 10 percent concentration of sodium chloride were observed, respectively. The highest shoot length (2.7cm) in control group (with zero-percent concentration of sodium chloride) and the lowest shoot length (zero) in chloride concentration 10% were observed, respectively. The results showed that there is a significant difference between different treatments of salinity on the average length of root and shoot at the %1 probability level. In this study, speed changes and germination percent in different concentrations of ammonium nitrate were zero except control group, so the results were not mentioned.

The second test: Effect of salinity and nitrogen on the growth and morphological characteristics of dill

Root length changes
Average root length in the effect of sodium chloride and ammonium nitrate salt was significantly changed at %1 probability level, so that in the comparison test of Duncan means, the highest root length (35/57 cm) and the minimum length of root (2-10 cm) were observed, respectively.

Changes along the main stem

The average length of the main stem of the effect of salt and the ammonium nitrate showed no significant changes at %1 probability level so that in the comparison test of Duncan means, the maximum length of main stem (70/6cm) and the shortest main stem (12-1cm) were observed, respectively.

Changes in the shoot's fresh weight

The average shoot fresh weightin the different treatments of the ammonium nitrate and sodium chloride showed significant change at %1 probability level so that in the comparison test of Duncan means, the maximum fresh weight of stem(640g) and the lowest weight (253g) were observed, respectively.

Changes in the shoot's dry weight

The average changes in dry weight of aerial organs in the different treatments of the ammonium nitrate and sodium chloride showed significant change at %5 probability level so that in the comparison test of Duncan means, the maximum dry weight of stem(104g) and the lowest dry weight of the stem (41g) were observed, respectively.

Change in the root's wet weight

The average wet weight of root in the different treatments of the ammonium nitrate and sodium chloride showed significant change at %1 probability level so that in the comparison test of Duncan means, the maximum wet weight of root (708g) and the lowest dry weight of the root (328g) were observed, respectively.

Change in the root's dry weight

The average dry weight of root in the different treatments of the ammonium nitrate and sodium chloride showed significant change at %1 probability level so that in the comparison test of Duncan means, the maximum dry weight of root (14/9 g) and the lowest dry weight of the root (5/9 g) were observed, respectively.

Relative Growth Rate (RGR)

Relative growth rate with increasing concentration of sodium chloride and ammonium nitrate in the pot soil showed significant change at %1 probability level so that in the comparison test of Duncan means, the highest relative growth rate (0/138g) and the lowest relative growth rate of plant (0/073g) were observed, respectively.

Changes R / S (ratio of root dry weight to shoot dry weight)

By increasing the concentration of NaCl in the potting soil, R/S rate showed significant changes at %5 probability level so that in the comparison test of Duncan means, the highest R/S rate (0/173 g) and the lowest R/S rate of plant (0/101g) were observed, respectively.

DISCUSSION AND CONCLUSION

The results of the first test

The results of the germination rate

The results showed that with increasing salinity level, the rate and germination percentage is reduced, so that the highest germination rate in the control group and the lowest percentage of germination of 1 treatment (one-tenth percent concentration of sodium chloride) were observed, respectively. In ammonium nitrate treatment, it was also observed that with increasing concentration, the percent and germination rate are reduced. Generally salinity causes delayed germination and reduced percentage and germination rate. Depending on the severity of salinity, it can cause lack of or delay in seed germination and emergence and undermines the yield of plant production. Some plants such as wheat and barley have low tolerance to salinity in the seed germination stage, but their tolerance is increased at later growth stages [16]. Mean comparisons showed that the highest germination percentage (79%) was obtained in water with zero salinity. Research on Allerolfea occidentalis showed that with increasing concentration of NaCl, germination rate is stopped and germination rate is also reduced [17]. In addition to the potential of free water, salinity will also affect in the seed germination by toxic effects of ions such as Na^+ and Cl^-

[18]. Studies show that germination percentage and rate decrease with increasing salinity [19]. To start metabolic activity in the plants, it is necessary that the amount of water to be absorbed by them, which it is different depending on the chemical composition and permeability of seeds shell [20]. For each species, there is certain water potential that germination cannot occur in it [21]. According to the components of germination and vigor of plant, it can be concluded that the dill medicinal plant is sensitive to the salinity level in irrigation water more than four dS in term of germination [18]. With an increase in the salinity, percentage and rate of seed germination decrease sharply [22]. The results of the research are consistent with the above-mentioned results. The probable cause for reduced germination characteristics in different levels of salinity (sodium chloride) can be toxic effects of ions such as Na^+ and Cl^-. Reduced rate and germination percent in different concentrations of ammonium nitrate can be traced back to the inhibitory effect of ammonium for nitrate uptake.

Root and shoot

The results showed that the maximum length of root and shoot in the control group and the minimum length of root and shoot in Group A (with a concentration of 10% sodium chloride) were observed. As well, the maximum length of root and shoot in ammonium nitrate treatment in the control group and the minimum length of the treatment of (ammonium nitrate at a concentration of 10%) were observed, respectively. In a study of safflower cultivar, it was observed that root and shoot length as well as dry weight of root and shoot were decreased with increasing salinity levels in all cultivars [23]. In the research conducted on the species *Hedysarum criniferum* , it was observed that there are significant differences at 5% probability level in terms of the root and shoot length and vigor index at different levels of salinity. It also showed that with increasing salinity, root and shoot length and vigor were also decreased [24]. In addition, in the study of the seeds of *sisymbrium irio* (*Descurainia sophia*), the results indicated reduction in the percentage and germination rate, root and shoot length, root and shoot dry weight in different concentrations of salinity. Significant difference was observed between the different levels of salinity (P≤0/01). *Sisymbrium irio* was sensitive to high salinity in plant germination stage [25]. The results are consistent with the result of the above mentioned researchers. Reduced root and shoot growth by applying sodium chloride, is probably due to the toxic effects of ions such as Na^+ and Cl^-. Yet the decreased root and shoot growth with treatment of ammonium nitrate may be due to changes in pH and ammonia toxic effect on the seed.

The results of the second test: Results of the effect of salinity and nitrogen on plant

Growth and Yield

The main stem and root length decreased with increasing salinity, however, by applying ammonium nitrate, it was gradually increased. Relative growth rate was also decreased with increasing salinity, yet with treatment of ammonium nitrate at concentrations up to 90 gr it was increased and declined with sodium chloride treatment at higher concentration of sodium chloride per 100 kg in the soil.

In addition, R/S ratio was reduced in different salinity levels and by adding ammonium nitrate; it was partly increased in salinity levels, so that no significant difference was observed in different levels of salinity.
It is generally recommended that fertilizer is a better choice for saline soils than normal conditions. Based on a general recommendation, if irrigation water salinity is more than 6 dS m, it is better to add 20 kg urea for every unit increase in the salinity. Urea fertilizers (urea derivatives) and urea with coated sulfur need the microbial activity and specific enzyme in the soil to be usable by grown plants, and since the microbial activity is very low in saline and sodic soils, the use of the fertilizer is not recommended in saline and sodic soils. As well, ammonium nitrate fertilizer is not recommended in saline and sodic for its high salinity and rapid dissolution and production a higher salinity than other nitrogen fertilizers [16]. Studies also show that adding nitrogen (in soils with nitrogen deficiency) showed that the addition of nitrogen, has not improved the growth and yield of a large number of plants, such as wheat, alfalfa, barley, beans, carrots, tomatoes, corn, clover, beans, millet while salinity was not too severe [26]. Considering that during the low nitrogen uptake for various reasons such as the permeability of plant roots, reduced soil microbial activity and subsequent reduction of mineralization of organic compounds, the absorption of nitrate is decreased in large amount in the root growth for the use of chlorine anion. In these conditions, nitrogen consumption could partly compensate for this problem and increase the yield. Also increased yield of wheat in saline conditions for further consumption of nitrogen fertilizer can be due to the reduction of sodium chloride concentration in plants [24]. By studying the interactional effects of salt and potassium nitrate fertilizer in the citrus seedlings in saline conditions, it was shown that uptake and nitrogen use yields were decreased. The results also showed that the optimal salinity increased nitrogen use in situations that shoot growth

temporarily affected by nitrogen absorption. The priority of nitrogen fertilizers in saline conditions is as follows: urea, ammonium sulfate, ammonium nitrate. Salinity index which is suggested as an indicator of salinity by fertilizers in ammonium nitrate, urea and ammonium sulfate is 104/7, 75/4 69 in per molecular weight of fertilizers, respectively [27]. Salinity stress with toxic effects of sodium and chlorine, and disturbance in the absorption of important elements, reduces the plant growth and yield, however, by applying ammonium nitrate to the plant prevents the absorption of sodium and chloride in plant growth and increases crop yield.

This study aimed to investigate the effect of salinity and nitrogen on the growth and morphological features of dill plant. For this purpose, various tests were carried out and the relevant findings were discussed. As mentioned at the beginning of the study, according to many properties of medicinal plants and humans need to use these drugs, their effective production is always of utmost importance. In short, it is hoped that by adopting appropriate strategies and policies based on a realistic understanding of the state of agriculture in the country and the use of correct scientific methods in all aspects, including planting, harvesting and industrial and economic exploitation, whether of nature or for mechanized cultivation, genuine understanding of the role and efficiency of medicinal plants growing in countries such as Iran will be reached and the protection of national assets to achieve prosperity and sustainable development of society will be accessible [28].

CONFLICT OF INTEREST
Authors declare no conflict of interest

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ARTICLE	OPEN ACCESS

INVESTIGATING THE IMPACT OF CONSUMER'S SATISFACTION ON SELECTING HOTEL (CASE STUDY: PARS HOTEL OF AHVAZ AND ABADAN)

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ABSTRACT

The aim of this research was to examine the impact of consumer's satisfaction on loyalty and selection of customers of Hotel PARS of Abadan and Ahvaz. Accordingly, a sample included 384 customers from PARS hotel of Abadan and Ahvaz was selected and investigated as randomly available. Based on model of TSAI, the research conceptual model and a questionnaire were designed and the intended data was collected. The formal method was used for examining the validity of questionnaire and the Cronbach's alpha method for investigating the reliability. The collected data was analyzed by software of SPSS and LISREL. The results suggest that it is the satisfaction of the brand performance, satisfaction of services, the satisfaction of fair price have a significant impact on the selection. Also the mediating role of the passionate love for brand and emotional attachment in relationship between the satisfaction of performance and the selection and the mediating role of passionate love for brand and the emotional attachment in the relationship between the satisfaction of fair price and selection were confirmed.

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INTRODUCTION

In today's world because of the type of services and also increasing expectation of customers, the hotels have inevitably to improve the quality of services and their communication for satisfaction of their customers. For this purpose the hotels sometimes spend much money in this field. On the other hand the hotels want to be pioneer in competitive market. With regard to the competitive hotel management industry the attention to the satisfaction of the guests to convert the guests to the loyal guests is in priority. Hospitality management for maintaining customer is largely effective in creating loyalty [1]. The past two decades of research show that the satisfaction of guests leads to return of guests to the hotel, the positive by word of mouth advertising and loyalty [2].

Satisfaction has been defined as a positive effective state that is resulted from a company's evaluation of all aspects of its working relationship with other company [3]. Satisfaction also is defined as a degree of satisfying the customer's expectations as a result of company's real performance [4]. With increasing focus on the hotel management in the past 13 years, it can be observed that the satisfaction of the guests is used as a tool for branding [4]. Strategic management of satisfaction when people confront the different options for selecting hotel will be of special importance. Hotel guests understand often the hotel services through the features of the hotel which is related to their satisfaction.

On the other hand, the behavior of employees is a key factor in determining the quality of services and satisfaction. So it can cause the satisfaction and strengthen the brand equity of the hotel. The behavior of the service employees in terms of merit, competence, responsiveness and collaboration, dressing are some important elements to assess the quality of services and can create memorable experiences for the consumer and lead to consumer's satisfaction and loyalty [5].

Cleaning rooms, polite and experienced employees, employees' being friendly and attractive physical environment of the hotel are some factors that cause the satisfaction of the guests of the hotel and loyalty [2]. The brand of hotels whose level of satisfaction is high, their employment rate also is great; recommending a hotel to others shows in reality the amount of guests' satisfaction of staying at that hotel. Customer's satisfaction has a direct relationship with continued buying. In the hotel management industry sometimes the guests' satisfaction causes to be recognized the hotel brand in the world [6]0 It also has proved that the passionate love is a powerful

force for selecting permanently the hotel brand. Attachment means the repetition of purchase or return towards the provided services or products [7].

The stable attraction means repetition of purchasing whose reason is the mental processes. In other words, repetition of the purchase is not merely an optional response; but it is a result of psychological, emotional and normative factors. [8]defines the stable attraction as a deep commitment to renewed purchase or the support of a product or a service of interest, despite that the situational influences and marketing efforts cause to repeat the purchase of a trade name or a products set of a trade name in the future.

Customer's satisfaction is also associated with the stable attraction. Many researches demonstrate there is a positive and significant relationship between customer's satisfaction and stable attraction and this affects the company's performance [7]. Since this issue has not been addressed so far, the current research tends to fill the research vacuum. According to the above discussion, the main issue of this research is to investigate whether the brand satisfaction, the satisfaction of services, the satisfaction of fair price, passionate love for brand and emotional attachment have the impact on the customer's selection and loyalty?

At first we investigated the background related to the relationship among the research variables and then the conceptual model.

[18] examined the role of brand satisfaction in creating brand loyalty. The results of the research suggest that satisfaction of brand has a positive and significant effect on loyalty to brand. Also [19] studied a model for measuring the impact of the confidence of the Banks' brand on customers' loyalty commitment. The results of this research suggest that increasing in the customers' satisfaction causes to advertise and recommend his/her bank to others and also tend to reduce the Bank change.

In a research that [10]carried out, the results showed that improvement of the quality of services can increase the customers' loyalty. Also, the results showed that the dimensions of reliability, sympathy and the confidence of service quality have a significant role in increasing the customers' loyalty. In their researches, [6]revealed the service quality affects the customers' loyalty by mediation of satisfaction. In another research, [11]showed that the quality of services has an impact on customers' loyalty. Also in a research [2]investigated the impact of the quality of services on the customers' satisfaction and loyalty in hotel management industry in Pakistan. The results showed that the quality of services has a significant direct impact on customer's satisfaction and loyalty. In a research,[17]examined the relationship between quality of services and satisfaction on the one hand and loyalty of customers of the banking industry in Meybod of Yazd province. The research's statistical population included the customers of banks of Meybod in February of 2011; through time sampling 180 people were selected. The results showed that the quality of services and satisfaction are associated positively with the customers' loyalty.

In a research entitled as "the impact of the factors of price perception on customer and acceptance of the price (case study: cell phone services, company of MTN Irancell)", [20] investigated the impact of a fair price on customer's satisfaction and loyalty. Based on the analysis of the collected data, the fair price has a positive impact on the price satisfaction, customer's satisfaction and loyalty. Also the price satisfaction affects positively the customer's satisfaction and the customer's satisfaction influences his/her loyalty. The results of research indicate that the fair price is the cornerstone of price satisfaction, customer's satisfaction and loyalty. In a research [4]embarks upon to investigate the impact of a fair price on customer's satisfaction and loyalty in hotel management industry in Nigeria. The results showed that the fair price has a significant and positive impact on customer's satisfaction and loyalty. In a research [5] indicated that the fair price leads to customer's satisfaction and increases customer's attitude loyalty.

In a research [13,14]showed that passionate love for brand has a mediating role in the relationship between satisfaction and loyalty to brand. In a research entitled as "relationship between the brand and the consumer (case study: household electric appliance)" [19]investigated the relationship between the brand and the consumer. The results of research suggest that brand satisfaction has a positive and significant effect on the passionate love for brand and love for brand on loyalty to brand.

[16]in a research indicated that the satisfaction of the brand performance has a significant impact on the emotional attachment and the emotional attachment on the loyalty. In a research [21]took out an investigation about the factors affecting the loyalty of tourists of Bandar-e Anzali and its recreational areas. This research explores the role of attachment to place as the mediator of the relationship between the tourists' positive evaluation of the experience of the city (satisfaction) and their loyalty to it. The results showed that the satisfied tourists experience a level of the emotional attachment to the host city and finally become loyal to it. [15]indicated that a fair price

has an impact on the emotional loyalty towards the brand. Also in a research [12]embarked upon the impact of satisfaction of price on loyalty. The results showed that the fair price has a significant impact on the loyalty.

Conceptual model of research has been borrowed from the model of [16]. In this model the consumer's satisfaction of brand services, satisfaction of the brand performance and satisfaction of fair price have been considered as the independent variables, the perpetual selection of brand as the dependent variable and emotional attachment and the passionate love for brand as the mediating variables. According to this model, the customers' satisfaction of brand services, satisfaction of the brand performance and satisfaction of fair price affect directly the brand selection. Also the consumers' satisfaction of the brand services, satisfaction of the brand performance and satisfaction of fair price affect the brand selection through creating the passionate love for brand and emotional attachment.
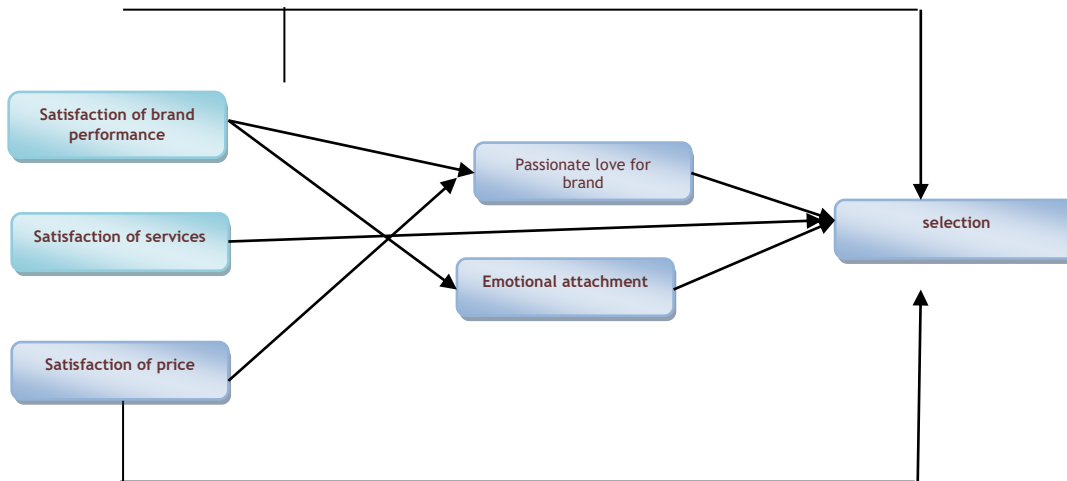
Fig: 1.The research conceptual model, Source (Tsai, 2014)

METHODS

The present research is an applied one in terms of the objective. Also in terms of percentage of identifying the relationship is the intensity and type of relationship between the independent and dependent variables, it is of correlation kind. In this research the statistical population is the PARS hotel's customers of Ahvaz and Abadan. Accordingly, in order to determine the sample size the Cochran formula has been used and a sample composed of 384 customers of PARS hotel were selected and evaluated as randomly available. To collect the data, the questionnaire of [16]has been designed; it consists of 6 questions to measure passionate love for brand, 5 questions to evaluate emotional attachment, 5 questions to evaluate the satisfaction of performance, 5 questions to evaluate the satisfaction of the services, 4 questions for measuring satisfaction of fair price and 3 questions for measuring the loyalty. The method of formal validity has been benefited for evaluating and measuring the validity of questionnaire and the questionnaire's reliability coefficient was calculated by Crobach's Alpha method; for variables of the satisfaction of brand performance, satisfaction of services, the satisfaction of fair price, passionate love for brand, emotional attachment, the following values for the whole questionnaire were obtained respectively, 0.641, 0.696, 0.695, 0.827, 0.786, 0.814 and 0.932. We used the Pearson correlation coefficient for analysis and regression test for investigation, rejection or confirmation of the hypotheses and the confirmatory factor analysis for ensuring that the variables are the appropriate representative of the structures and for ensuring the appropriateness of the model measurement. In this research, for analyzing data we use the software SPSS (19.0) and Lisrel (8.5).

RESULTS

Age class of participants in this research was as follows: 19% less than 25 years, 48% between 25 to 35 years, 21% between 35 to 45 years, 8% between 45 to 55 years and 4% more than 55 years. Information relating to the gender of respondents indicates that 32% of this population was women and 68% of it was men. The findings related to education suggests that 9% of respondents did not have higher education, 31% of the respondents had diploma, 25% of them had a two-year diploma, 27% was bachelors and 8% in higher undergraduate and graduate degree.

In this research for testing the normality of data the Skewness and Kurtosis of variables has been used, as in **Table-1**observed. Kurtosis and Skewness of data is between 2 and -2; then the distribution is normal. Therefore, in order to examine the relationships among the variables the Pearson correlation test must be used.

Table: 1. Table of Kurtosis and Skewness of variables

Variable	condition	Kurtosis	Skewness	Test type
Satisfaction of brand performance	normal	1.534	-0.911	parametric
Satisfaction of services	normal	1.333	-0.807	parametric
Satisfaction of fair price	normal	1.523	-0.929	Parametric
Passionate love for brand	normal	1.452	-1.089	Parametric
Emotional attachment	normal	0.329	-0.725	Parametric
selection	normal	1.822	-1.410	Parametric

Confirmatory factor analysis

In order to investigate the suitability of the selected questions for evaluating the variables under study, the confirmatory factor analysis is used. In this stage, at first we will examine the indicators of each model of confirmatory factor analysis and then using Lisrel charts we will investigate the significance of relationship between each question and the factor under investigation in two modes of significance and standard. The results of confirmatory factor analysis have been summarized in **Table - 2**.

Table: 2.The results of factor analysis of questions of items selected for measuring the variables under study

Variable (factor)	Significance value	Standard factor load	Indicator and reference (item)
Selection	7.24	0.37	E1
	10.68	0.52	E2
	12.55	0.60	E3
	20.10	0.84	E4
	18.16	0.79	E5
	17.94	0.78	E6
	17.46	0.77	E7
	17.30	0.76	E8
	15.83	0.72	E9
Satisfaction of fair price	20.36	0.84	P1
	24.42	0.94	P2
	12.47	0.56	P3
	7.85	0.37	P4
Passionate love for brand	22.37	0.90	B1
	23.30	0.92	B2
	18.88	0.81	B3
	7.69	0.39	B4
	6.40	0.33	B5
	9.22	0.46	B6
Emotional attachment	10.68	0.53	A1
	10.01	0.50	A2
	9.68	0.49	A3
	15.81	0.73	A4
	17.38	0.78	A5
Satisfaction of brand performance	19.78	0.82	R1
	24.35	0.94	R2
	12.75	0.58	R3
	7.62	0.36	R4
Satisfaction of Services	18.77	0.81	S1
	22.10	0.90	S2

10.97	0.54	S3
5.24	0.27	S4
7.33	0.37	S5

Since statistically it is recommended that the factors of the regression weight value (factor load) higher than 0.30 are considered significant and acceptable [10], so in the model under study all regression weights except for s4 have the values greater than 0.30 and all critical ratios (t-value) are significant at the level of P< 0/01. Therefore, all desired factors are confirmed and the overall fitness indicates the good fitness of the measurement model under study with the observed data.

Fig: 2. confirmatory factor analysis in standard mode
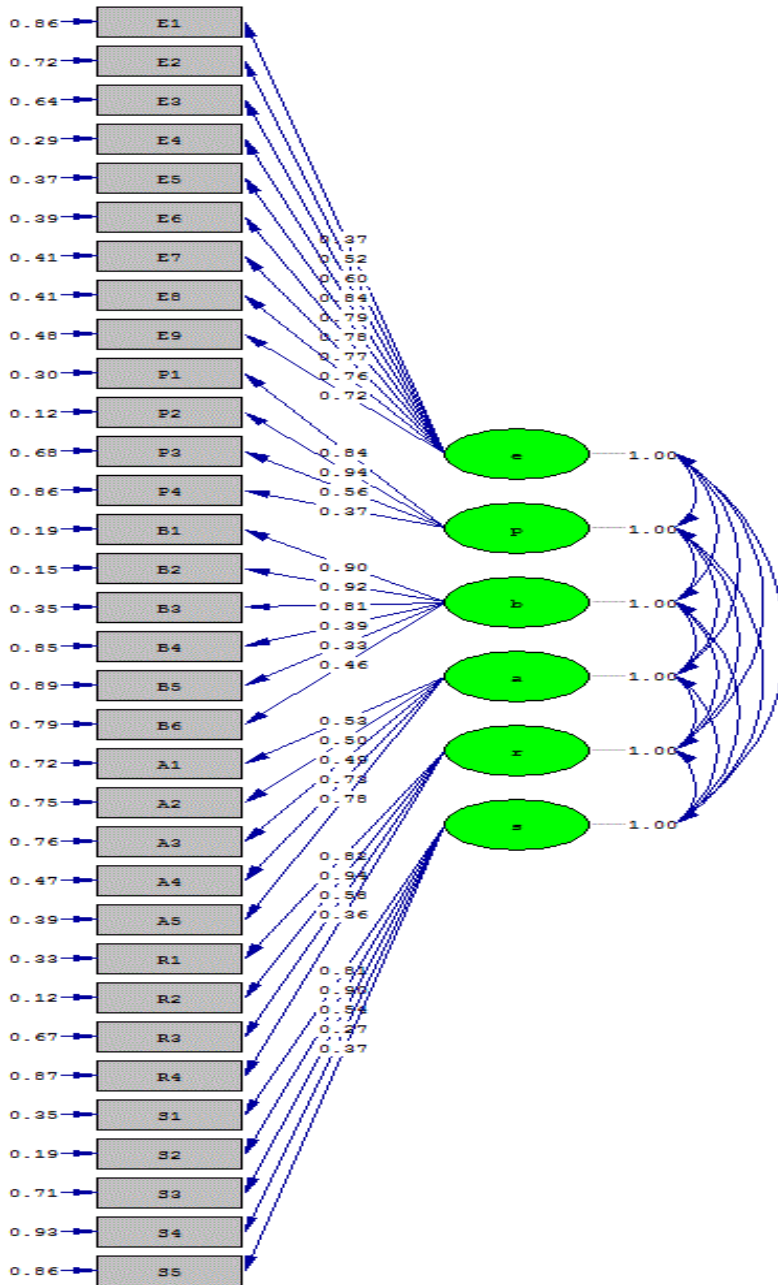
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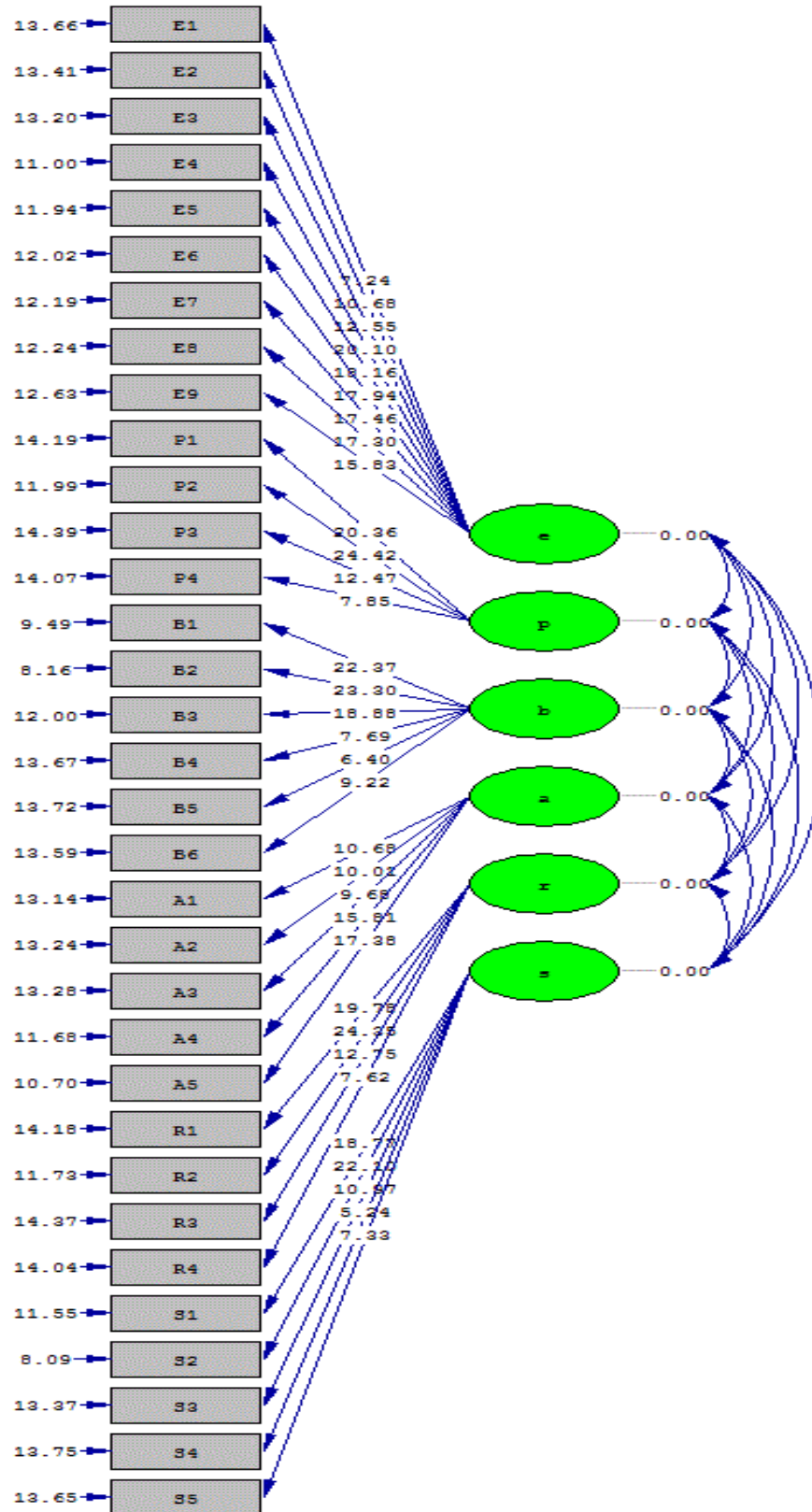
Fig: 3. confirmatory factor analysis in mode of t-value

Testing the research hypotheses

Before investigating the research full model, for examining initially the research hypotheses and determining the existence of correlations and significance relationship between two variables - since the provided answers have a normal distribution - the amount of Pearson correlation coefficient for the regression analysis is used with the help of the software SPSS19. The results of the regression analysis have been provided in **Table- 3.**

Table: 3. Results of regression analysis and correlation coefficient among the research variables

variable	Significance level	F-Statistic value	Determination coefficient	correlation coefficient	Hypotheses test result
Independent: satisfaction of brand performance Dependent: passionate love for brand	0.000	289.481	0.431	0.657	Confirmed
Independent: satisfaction of brand performance Dependent: emotional attachment	0.000	137.926	0.265	0.515	Confirmed
Independent: satisfaction of brand performance Dependent: selection	0.000	198.876	0.342	0.585	Confirmed
Independent: satisfaction of services Dependent: selection	0.000	177.908	0.318	0.564	Confirmed
Independent: satisfaction of fair price Dependent: passionate love for brand	0.000	272.138	0.416	0.645	Confirmed
Independent: satisfaction of fair price Dependent: emotional attachment	0.000	130.922	0.255	0.505	Confirmed
Independent: satisfaction of fair price Dependent: selection	0.000	197.813	0.341	0.584	Confirmed
Independent: passionate love for brand Dependent: selection	0.000	320.968	0.457	0.676	Confirmed
Independent: emotional attachment Dependent: selection	0.000	378.969	0.498	0.706	Confirmed

According to **Table- 3** and based on the test F, the regression modelsrelated toall variables are significant at the error level of 5% (becausethe significance level is smaller than 0.05). Also, the correlation value of variables shows that we can use the linear regression model to predict. Therefore, it is concluded there is a relationship between the dependent variables and independent variables.

As mentioned in the previous sections, for confirming or rejecting the hypotheses of present research the structural equations model has been used by help of LISREL software. In the present research the output ofLISREL software is observed in standard and significance mode for the research hypotheses in **Figures- 4 to 17**.

Since in this research the mediating role of variables also is checked, it should be noted that in investigatingthe relationships between variables thedirect and indirect impacts should be examined in spite of the role of mediating variable (fourth, fifth, sixth and seventhhypotheses). If the indirect effect is greater than the direct one, the mediating role of mediating variable is accepted (Test of Barron andKenny).
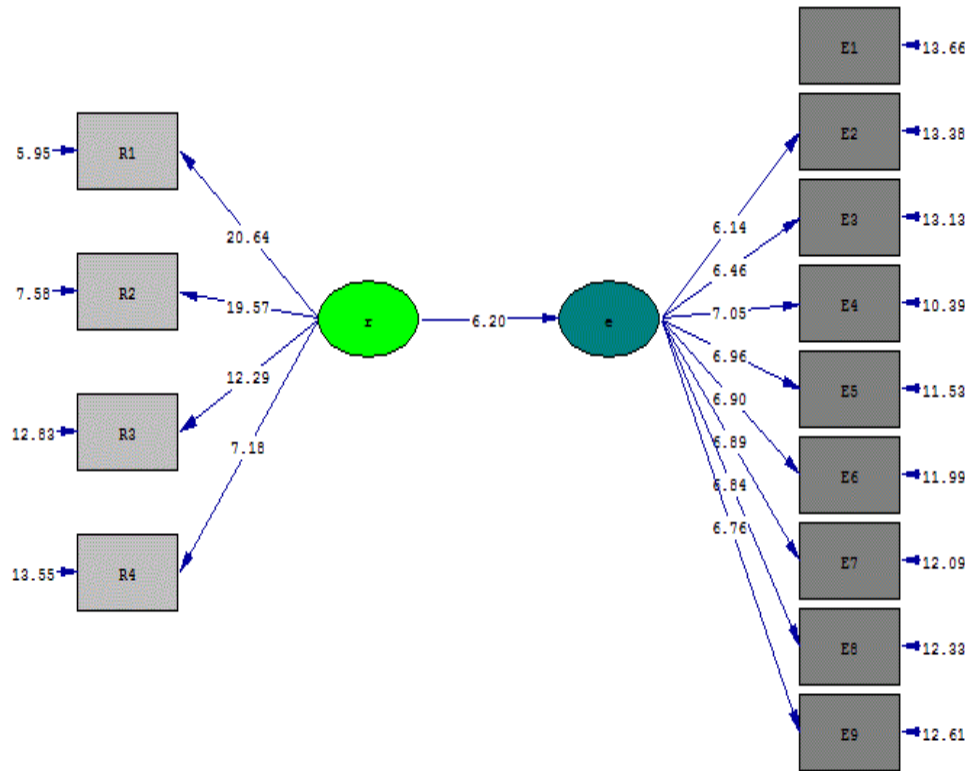
Fig: 4. output of the model of structural equations of first hypothesis in mode of t-values
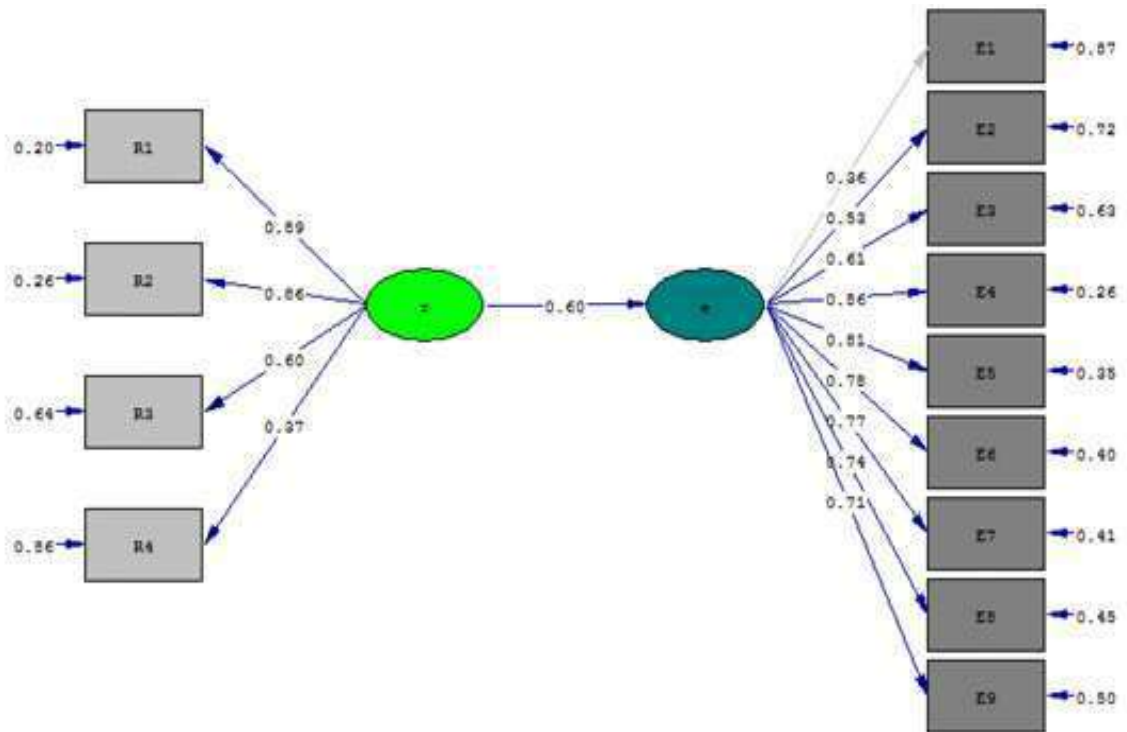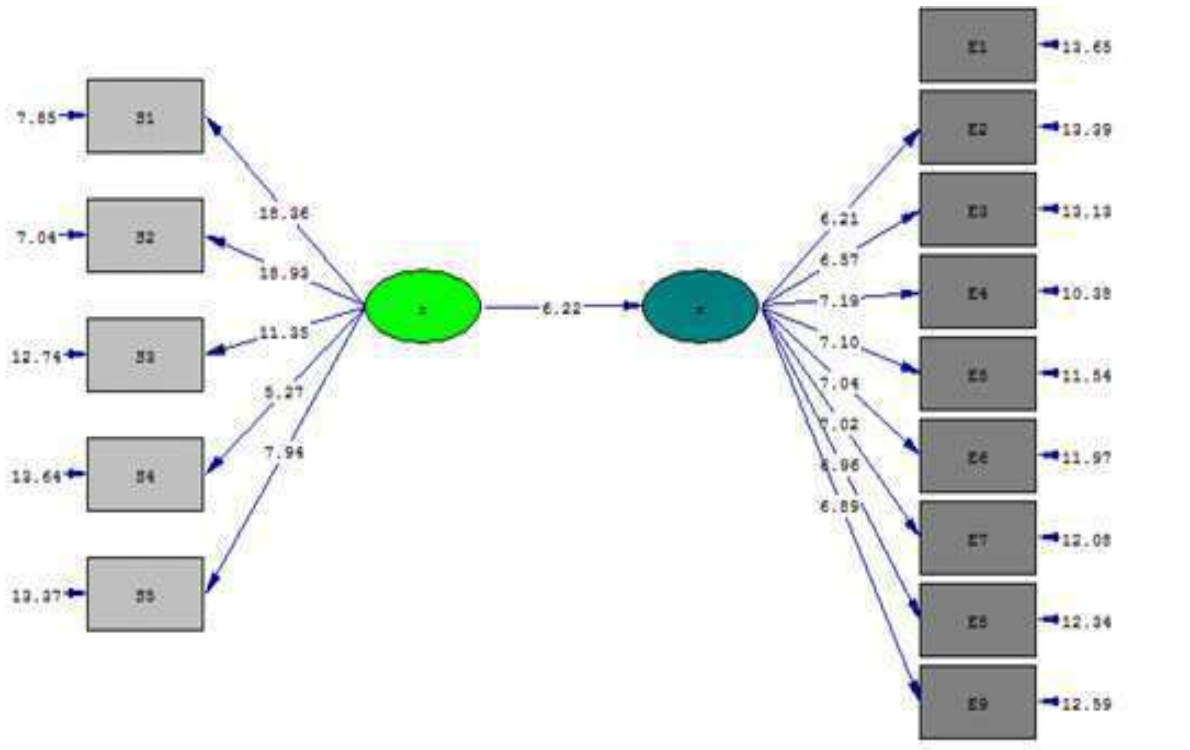

Fig: 5. output of the model of structural equations of first hypothesis in mode of standard

According to **Table- 3**, the amount ofcorrelation coefficient between two variables is equal to 0.585 with a significance level of 0.000. Because the amount of significance level is less than that of the error of 0.05, so the existence of a significant relationship between satisfaction of brand performance and selecting hotel with the error level of 0.05 is supposed to be confirmed. Also according to **Figures- 4 and 5 and Table- 4**, since the standard coefficient value of 0.60 and the significance value (t-value) is larger than 1.96 (equal to 6.20), we can say that the relationship between these two variables is significantat level of 95%.

Table: 4. first hypothesis test

First hypothesis	Standard coefficient	Significance numbers of t-values	Test result
Satisfaction of brand performance has an impact positively and significantly on selecting the hotel.	0.60	6.20	Confirmed

Fig: 6. output of the model of structural equations of second hypothesis in mode of t-values

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According to **Table-3**, the amount of correlation coefficient between two variables is equal to 0.564 with a significance level of 0.000. Because the amount of a significance level is less than amount of error of 0.05, the existence of significant relationship between the satisfaction of services and selecting hotel with a level of error of 0.05 is supposed to be confirmed. Also because the correlation coefficient is positive, relationship of these two variables is direct. Since the relationship of correlation was determined, the causal relationship between satisfaction of services and selecting hotel can be measured by the structural equations modeling method; according to **Figures-6 and 7 and Table-5**, in so far as the value of the standard coefficient is equal to 0.59 and significance value (t-value) is greater than 1.96 (equal to 6.22), at the level of 95 percent, it can be said that the relationship between these two variables is significant.

Table: 5. second hypothesis test

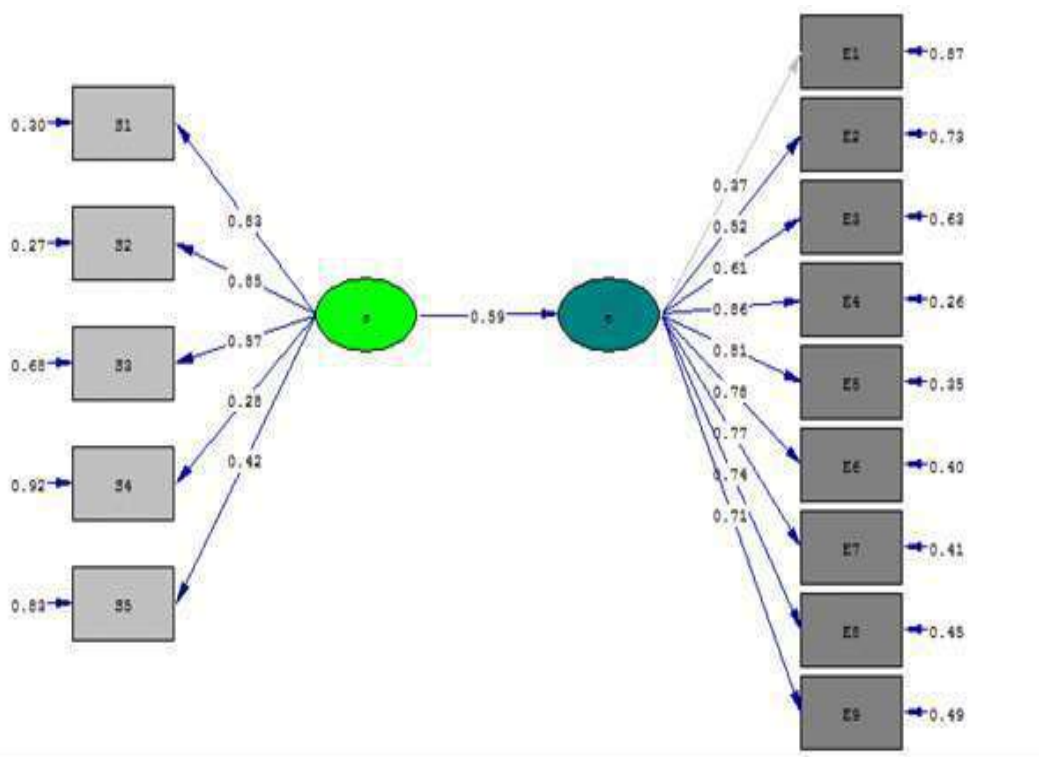| Second hypothesis	Standard coefficient	Significance numbers of t-value	Test result
Satisfaction of services has positively and significantly an impact on selecting hotel.	0.59	6.22	confirmed

Fig: 7. output of the model of structural equations of second hypothesis in mode of standard
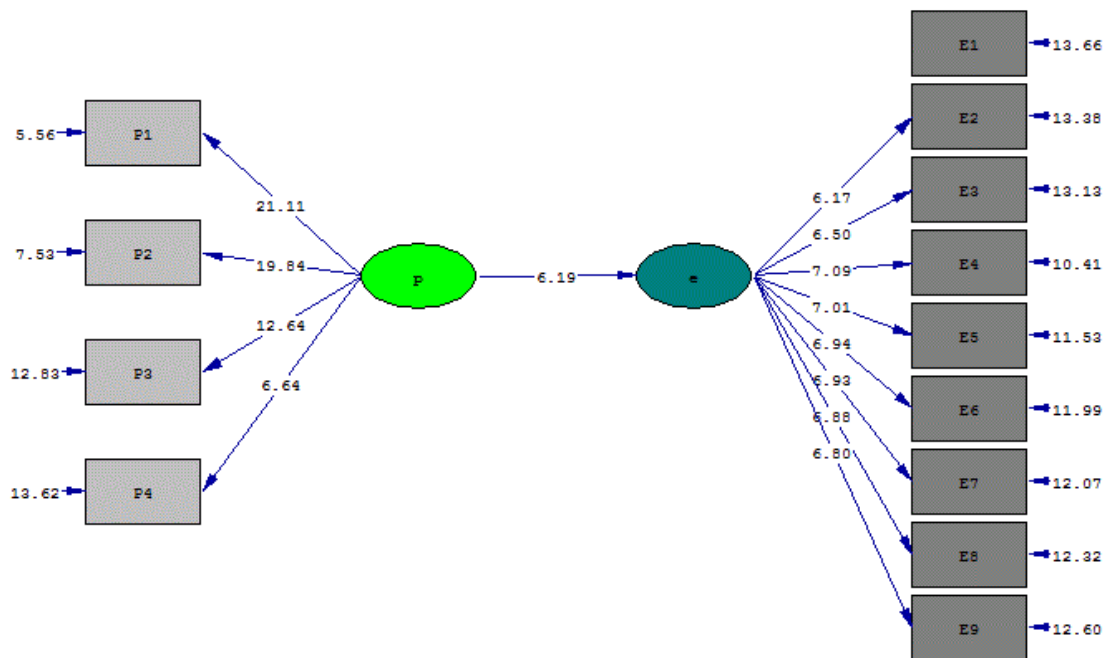

Fig: 8. output of the model of structural equations of third hypothesis in mode of t-values

Fig: 9. output of the model of structural equations of third hypothesis in mode of standard

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According to **Table-3**, the amount of correlation coefficient between two variables is equal to 0.584 with a significance level of 0.000. Because the amount of a significance level is less than amount of error of 0.05, the existence of significant relationship between the satisfaction of fair price and selecting hotel with a level of error of 0.05 is supposed to be confirmed. Also because the correlation coefficient is positive, relationship of these two variables is direct. Since the relationship of correlation was determined, the causal relationship between satisfaction of fair price and selecting hotel can be measured by the structural equations modeling method; according to **Figures- 8 and 9 and Table-6**, in so far as the value of the standard coefficient is equal to 0.59 and significance value (t-value) is greater than 1.96 (equal to 6.19), at the level of 95 percent, it can be said that the relationship between these two variables is significant.

Table: 6. Third hypothesis test

Third hypothesis	Standard coefficient	Significance numbers of t-value	Test result
Satisfaction of fair price has positively and significantly an impact on selecting hotel.	0.59	6.19	confirmed

Fig: 10. Output of the model of structural equations of fourth hypothesis in mode of t-value

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Fig: 11. Output of the model of structural equations of fourth hypothesis in mode of standard

According to **Figures- 10 and 11 and Table- 7**, the satisfaction of performance affects directly and indirectly and through the passionate love for brand the selecting the hotel; this indirect effect (0.39) is more than direct impact (0.21). So it can be said that the passionate love for brand has the mediating role between the satisfaction of performance and selecting hotel. Therefore, the fourth hypothesis is confirmed and represents a significant and positive relationship between the satisfaction of performance through the passionate love for brand and selecting hotel.

Table: 7. fourth hypothesis test

fourth hypothesis	Standard coefficient		Test result
	Indirect effect	**Direct effect**	
Passionate love for brand has a mediating role between satisfaction of performance and selecting hotel.	0.48*0.82 =0.39	0.21	confirmed

According to **Figures- 12 and 13 and Table- 8**, the satisfaction of performance affects directly and indirectly and through the emotional attachment the selecting the hotel; this indirect effect (0.45) is more than direct impact (0.16). So it can be said that the emotional attachment has the mediating role between the satisfaction of performance and selecting hotel. Therefore, the fifth hypothesis is confirmed and represents a significant and positive relationship between the satisfaction of performance through the emotional attachment and selecting hotel.

Table: 8.Fifth hypothesis test

fifth hypothesis	Standard coefficient		Test result
	Indirect effect	**Direct effect**	
Emotional attachment has a mediating role between satisfaction of performance and selecting hotel.	0.77*0.58 =0.45	0.16	Confirmed
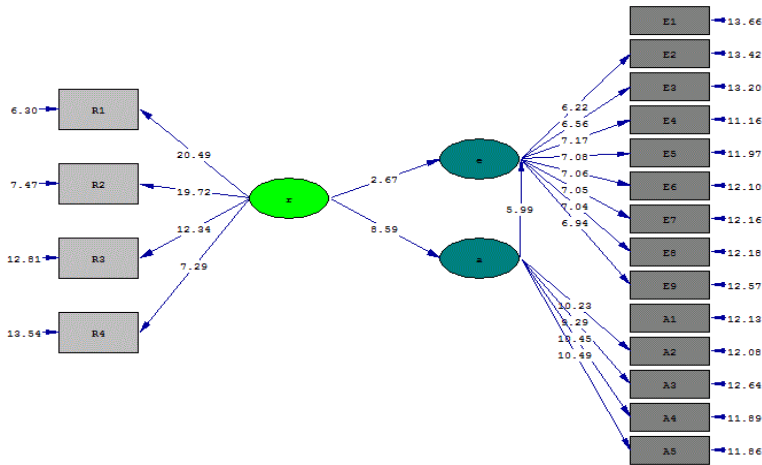
Fig: 12. Output of the model of structural equations of fifth hypothesis in mode of t-value

Fig: 13. Output of the model of structural equations of fifth hypothesis in mode of standard
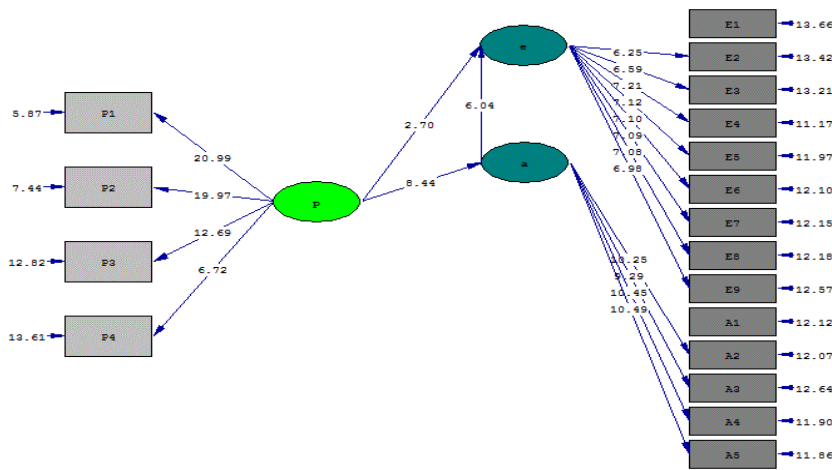
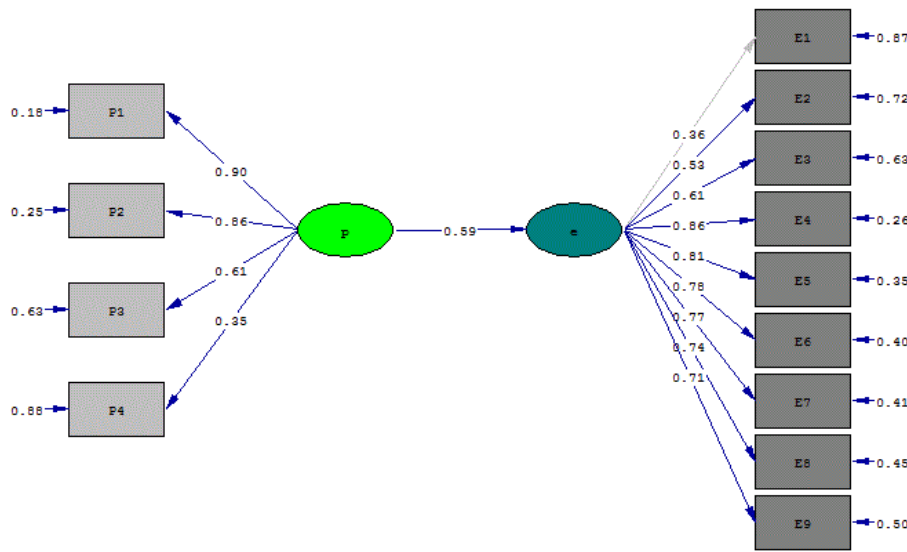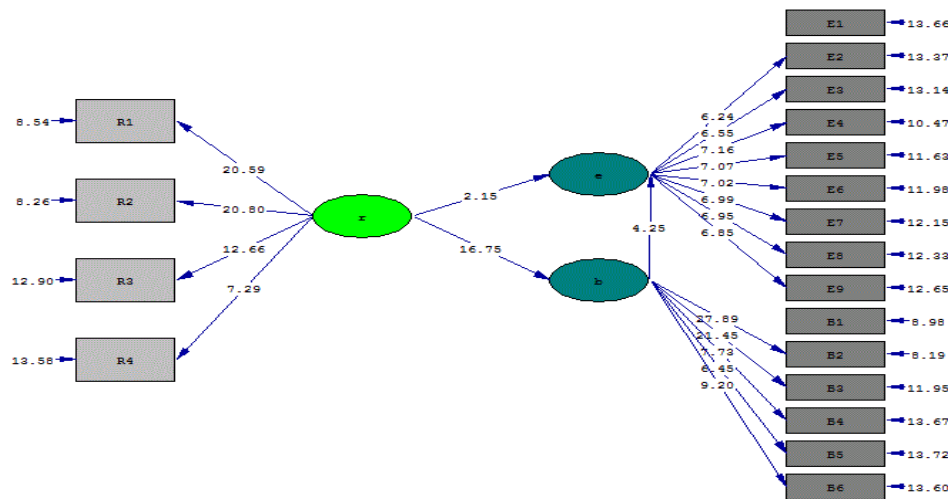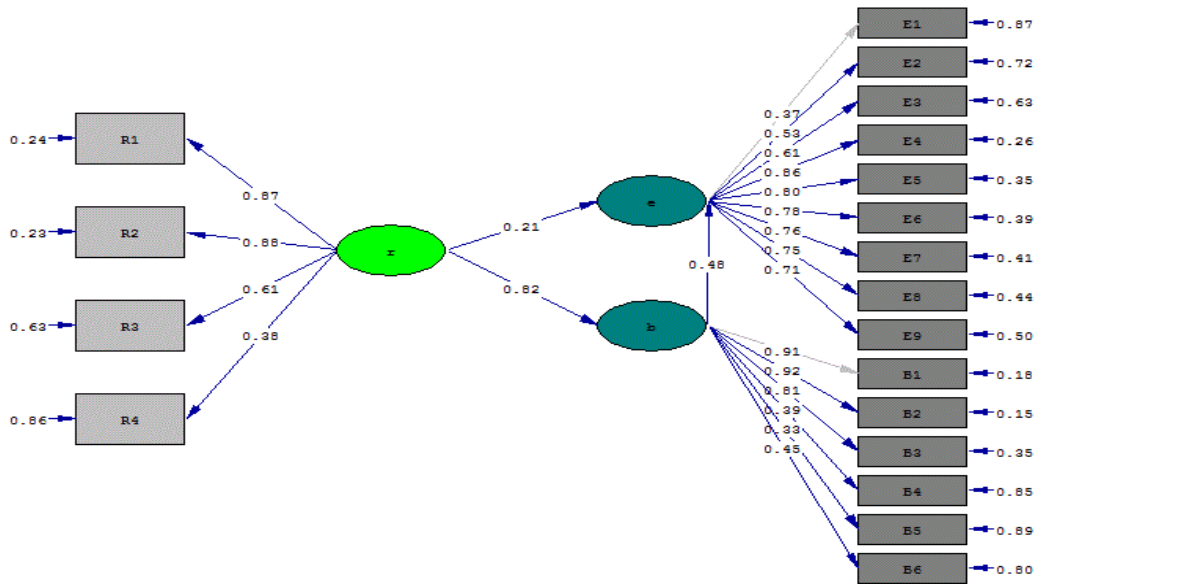**Fig: 14. Output of the model of structural equations of sixth hypothesis in mode of t-value**
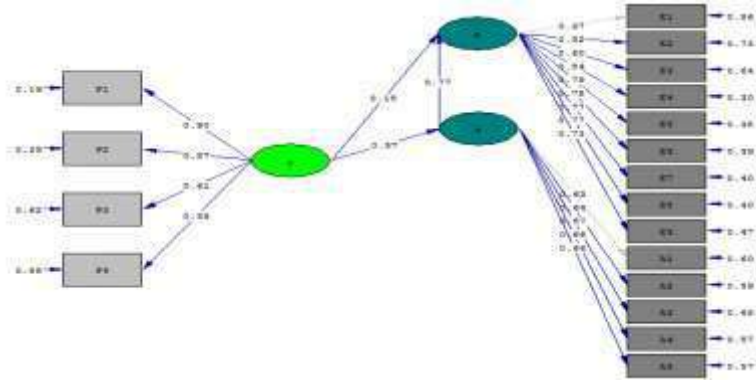
Fig: 15. Output of the model of structural equations of sixth hypothesis in mode of standard

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According to **Figures- 14 and 15 and Table- 9**, the satisfaction of the fair price affects directly and indirectly and through the emotional attachment the selecting the hotel; this indirect effect (0.44) is more than direct impact (0.15). So it can be said that the emotional attachment has the mediating role between the satisfaction of fair price and selecting hotel. Therefore, the sixth hypothesis is confirmed and represents a significant and positive relationship between the satisfaction of fair price through the emotional attachment and selecting hotel.

Table: 9. sixth hypothesis test

sixth hypothesis	Standard coefficient		Test result
	Indirect effect	**Direct effect**	
Emotional attachment has a mediating role between satisfaction of fair price and selecting hotel.	0.57*0.77 =0.44	0.15	Confirmed

Fig: 16. Output of the model of structural equations of seventh hypothesis in mode of t-value
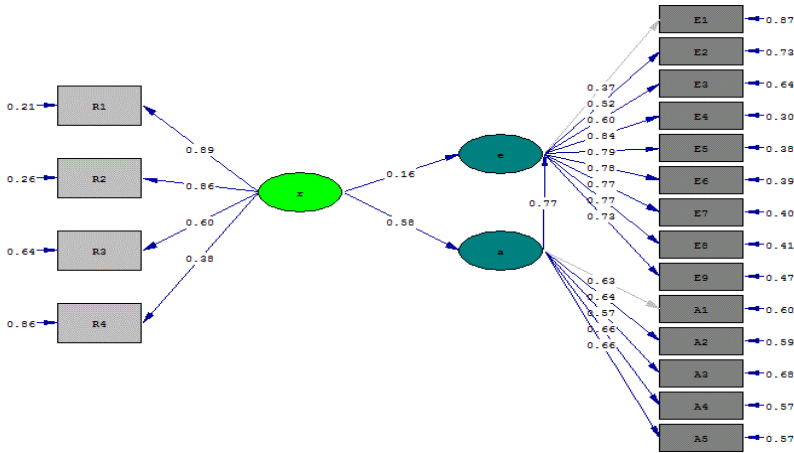
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Fig: 17. Output of the model of structural equations of seventh hypothesis in mode of standard

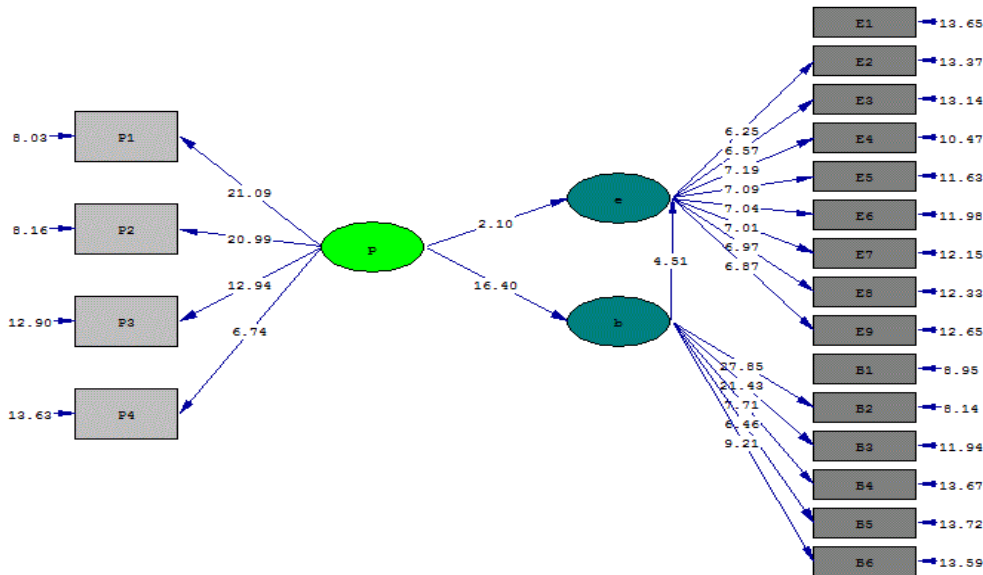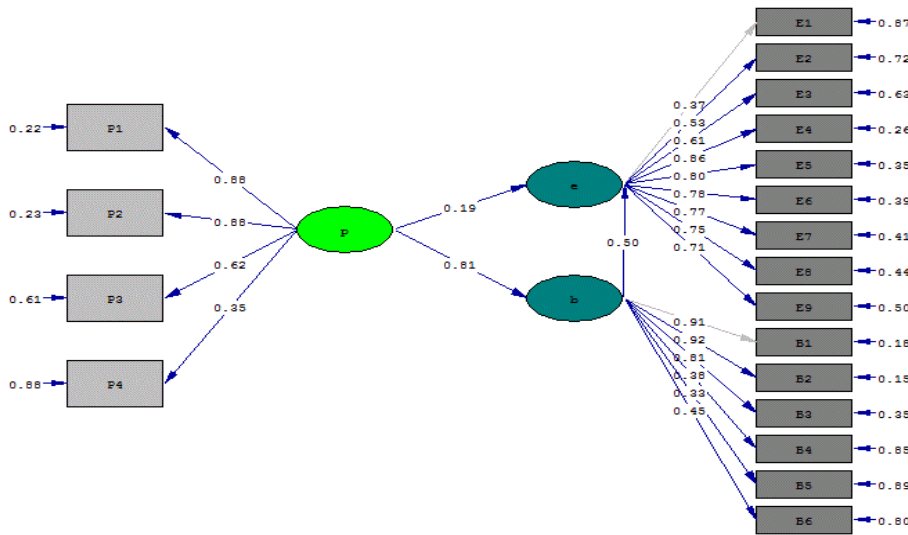...

According to **Figures- 16 and 17 and Table- 9**, the satisfaction of the fair price affects directly and indirectly and through the passionate love for brand the selecting the hotel; this indirect effect (0.40) is more than direct impact (0.19). So it can be said that the love for brand has the mediating role between the satisfaction of fair price and selecting hotel. Therefore, the seventh hypothesis is confirmed and represents a significant and positive relationship between the satisfaction of fair price through love for brand and selecting hotel.

Table: 10. Seventh hypothesis test

seventh hypothesis	Standard coefficient		Test result
	Indirect effect	**Direct effect**	
Passionate love for brand has a mediating role between satisfaction of fair price and selecting hotel.	0.50*0.81 =0.40	0.19	Confirmed

DISCUSSION AND CONCLUSION

First hypothesis: The satisfaction of the brand performance has a significant and positive impact on the choice of hotel.

The findings of the test of first hypothesis confirm the impact of satisfaction of the brand performance on hotel choice. Because the value of the standard coefficient is 0.60 and the significance value (t-value) is greater than 1.96 (equal to 6.20), at the level of 95 percent we can say the relationship between these two variables is significant; given that the correlation coefficient is equal to 0.585, the relationship of these two variables is positive and direct. The result of the first hypothesis test indicates that the outcome of the present research is consistent with the researches that have been carried out in this area by [15] and [18].

Second hypothesis: The satisfaction of services has a significant and positive impact on the choice of hotel.
The findings of the test of second hypothesis confirm the impact of satisfaction of services on hotel choice. Because the value of the standard coefficient is 0.59 and the significance value (t-value) is greater than 1.96 (equal to 6.22), at the level of 95 percent we can say the relationship between these two variables is significant; given that the correlation coefficient is equal to 0.564, the relationship of these two variables is positive and direct. The result of the second hypothesis test indicates that the outcome of the present research is consistent with the researches that have been carried out in this area by [10] and [6], and [17].

Third hypothesis: The consent of a fair price has a significant and positive impact on the choice of hotel.
The findings of the test of third hypothesis confirm the impact of satisfaction of a fair price on hotel choice. Because the value of the standard coefficient is 0.59 and the significance value (t-value) is greater than 1.96 (equal to 6.19), at the level of 95 percent we can say the relationship between these two variables is significant; given that the correlation coefficient is equal to 0.584, the relationship of these two variables is positive and direct. The result of the third hypothesis test indicates that the outcome of the present research is consistent with the researches that have been carried out in this area by [20].

Fourth hypothesis: The satisfaction of the performance has an impact through the passionate love for brand on the choice of hotel.
The findings of the fourth hypothesis test confirm the role of mediation of the passionate love of the brand in relationship between the satisfaction of the performance and choosing the hotel, because the indirect effect of the satisfaction of performance on choice of hotel (via passionate love for brand) (0.39) is more than the direct impact of the satisfaction of performance on choice of hotel (0.21). This represents a significant and positive relationship between the satisfaction of the brand performance through the passionate love for brand and choice of hotel. This finding is similar to the results of the studies of [13,14]and [19].

Fifth hypothesis: The satisfaction of the performance has an impact through the emotional attachment on the choice of hotel.

The findings of the fifth hypothesis test confirm the role of mediation of the emotional attachment in relationship between the satisfaction of the performance and choosing the hotel, because the indirect effect of the satisfaction of performance on choice of hotel (via emotional attachment) (0.45) is more than the direct impact of the satisfaction of performance on choice of hotel (0.16). This represents a significant and positive relationship between the satisfaction of the performance through emotional attachment and choice of hotel. This finding is similar to the results of the studies of [16]and [21].

Sixth hypothesis: The consent of a fair price has an impact through emotional attachment on the choice of hotel.
The findings of the sixth hypothesis test confirm the role of mediation of the emotional attachment in relationship between the satisfaction of fair price and choosing the hotel, because the indirect effect of the satisfaction of fair price on choice of hotel (via emotional attachment) (0.44) is more than the direct impact of the satisfaction of fair price on choice of hotel (0.15). This represents a significant and positive relationship between the satisfaction of the fair price through emotional attachment and choice of hotel. This finding is similar to the results of the studies of [16]and [15].

Seventh hypothesis: The consent of a fair price has an impact through the passionate love for brand on the choice of hotel.

The findings of the seventh hypothesis test confirm the role of mediation of the passionate love for brand in relationship between the satisfaction of the fair price and choosing the hotel, because the indirect effect of the satisfaction of fair price on choice of hotel (via passionate love for brand) (0.40) is more than the direct impact of the satisfaction of fair price on choice of hotel (0.19). This represents a significant and positive relationship between the satisfaction of the fair price through passionate love for brand and choice of hotel. This finding is similar to the results of the studies of [16]and [12].

CONFLICT OF INTEREST
The author declares having no competing interests.

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FINANCIAL DISCLOSURE
None.

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ARTICLE　　**OPEN ACCESS**

COST MANAGEMENT IN CONSTRUCTION PROJECTS WITH THE APPROACH OF COST-TIME BALANCING

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ABSTRACT

Project costs management is one of the main and undeniable components in the project management processes, which becomes more important in costly and long-term projects such as major construction projects. In this paper, the most important discussion of engineering is related to cost management, which is cost-time balancing. Cost-time balancing is one of the important issues in project control and planning. The purpose of this issue is the transactional analysis of a variety of project costs and project execution time. In computing the project scheduling, the earliest completion time of the last activity is usually considered as the project delivery date. On the other hand, the project completion time is met based on a series of internal or external restrictions or requirements. In most cases, the completion time is determined longer than the project delivery date by these restrictions. In such conditions, the project completion time can be reduced using some methods. Shortening the duration of the critical path method (CPM) is one of those cases by spending more cost or compressing them. However, the question that always involves the managers and planners' mind in various stages of projects is that how can achieve a proper balance between the estimated time and cost (which certainly are not certain) so that the project to be completed at the estimated time and proper quality while using the maximum available resources. A variety of algorithms and techniques have been developed in the last fifty years to help answering this question, which are divided into two classical and heuristic algorithms. In classical algorithms, some solutions have been presented for the time-cost balancing problem using mathematical techniques and research tools operations. Some of the most famous of these algorithms will be introduced. However, it has been tried in new algorithms to provide methods, which are more consistent with the actual space, or help the large-scale problems to find the optimal solution by using new algorithms such as fuzzy and genetic algorithms. Some of these heuristic algorithms have been proposed and studied in this research.

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INTRODUCTION

Today, the need for proper planning in order to estimate the project time and cost and the required resources in a project, which have a direct impact on implementation, handling, and operation such as the construction of equipment, construction of dams, highways, apartment complexes is not unsuspected for anyone. This problem is very important, especially in developing countries. Generally, management and planning activities, financial resources, human resources, and required equipment in a project need various analyzes that one of them is modeling and accurate estimation of project costs and time. This problem helps optimizing the project time and cost and decision-making in critical situations.

Programming problem and then, cost and schedule controlling in projects are becoming more important every day. In an environment where companies' competition gets closer every day and small differences in tender prices will lead to the success or failure of the tender, providing a plan that is consistent with the reality that can consider all economic realities in the model of a project has a great importance. This importance not only is for a project price before its implementation but also after beginning to work, a flexible schedule can help a company to face a variety of problems, which are often outside the scope of its discretion.

A flexible schedule is able to consider the necessary changes in the cost and time using the relationship between cost and time in a project. Thus, it can give proper solutions to decision-makers to have an appropriate estimation of time and cost in the project.

ENGINEERING

There are several steps for project control and planning, including project analysis, estimation of time, cost, and executive resources, and finally, project scheduling. In all these cases, especially during the initial evaluation of the project, it is assumed that all activities are calculated and executed in their real time. Sometimes, a project manager decides to reduce the project time for various reasons. This will have a direct impact on the project cost. As mentioned earlier, time reduction is realized using special measures such as increased use of execution resources such as increasing human resources, raw materials, the number of machines and the use of advanced machinery, which increases the costs of the project. Sometimes, delay conditions are expected for the project regarding the relationships and dependencies between activities. This condition is associated with increased costs and an internal interactive with delay damages. Therefore, it can lead to increasing or decreasing the overall costs that should be monitored by project management.
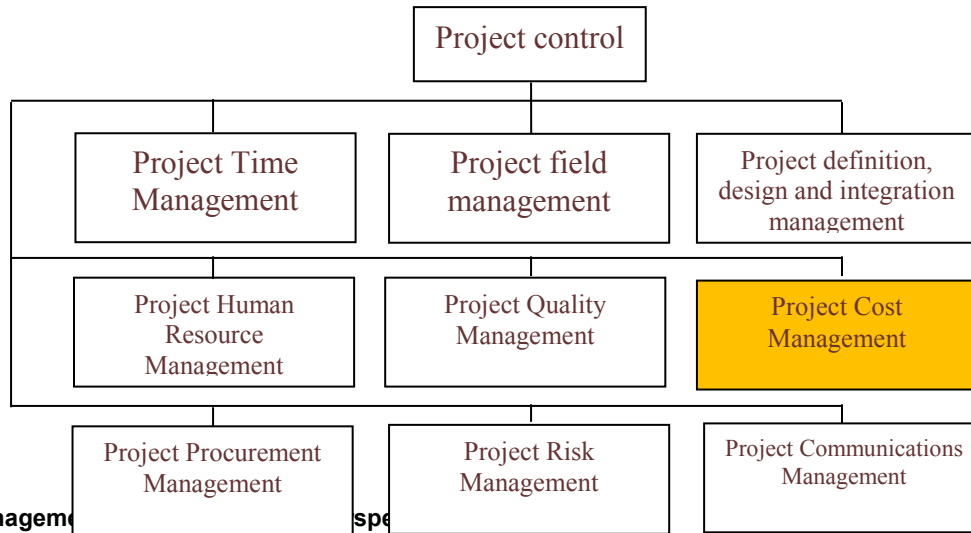
Fig: 1. Project management specsp

In the late 60's, seven principles of objectives, organization, planning, budgeting, coordination, control, and leadership were proposed to management. After a while, the project control issue was raised due to lack of efficiency in projects. Later, the ineffectiveness of control was also proved. Finally, project management topics were defined and explained in Article 9 for better efficiency to provide practical solutions to achieve project goals with less time and cost. It is for a while that the international community has accepted to choose project management instead of project control, but currently, the project control is unfortunately considered more in Iran. PMBOK[1] standard for cost management has identified nine sectors that are referred schematically in **Figure- 1**.
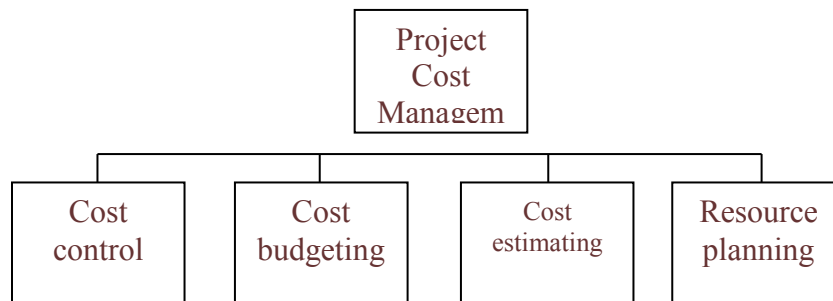
Fig: 2. Different parts of cost managementIn the first step, resource planning will be discussed.

Among these, cost management, which is related to this issue, will be considered. Cost management includes four topics, including resource planning, cost estimating, cost budgeting, and cost control, which is shown

schematically in **Figure- 2**. These four topics are linked together as a chain so that each topic contains 3 input, processing and output sections. Each output is the input of the next section.

MATERIALS AND METHODS

Resource Planning

Resource planning determines this point that what kinds of resources including human resources, materials, equipment, and how many of them should be used to complete each of the project activities. The following sections of this topic are shown in [**Figure- 3**].
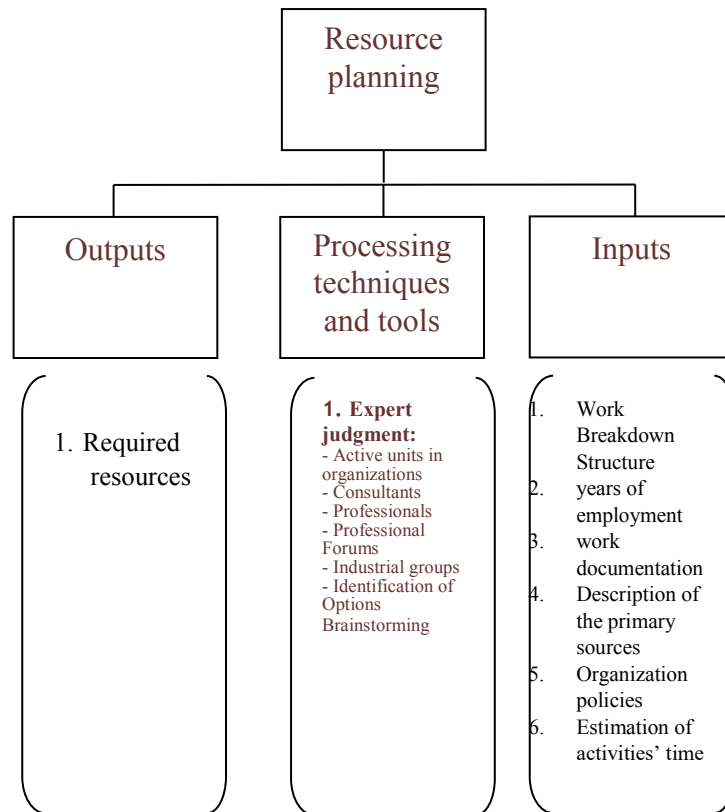
Fig: 3. Resource planning sub-sections in cost management

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Cost Estimation

This section provides an estimation form of costs related to the required resources to complete the project's activities. Every project needs a level of estimation of costs regardless of its implementation duration. The economic success of the project or the possibility of a series of measures depends on assumptions about future events. Estimation begins with an understanding of the current situation, and experience is its main base. The most important data for estimation is the recorded cases in the company. The most common estimation methods are trend and regression analysis, which are both mathematical methods for estimating based on previous historical data. Computer modeling is also another method, which has been considered so much in the recent years [1].

The purpose of estimation is our knowledge about the project and the time and cost that we are willing to pay. The accuracy and reliability of an estimation depend on the accuracy of the limited definition of the project and the time and effort that have been paid. Some of the factors that affect the estimations include:

- Technology advancements
- Inflation Forecasts
- Potential cost controls
- Safety and environmental regulations

- Social issues
- Money value fluctuations
- Export-Import considerations (sanctions)
- Commercial and tax prohibitions
- Inflationary pressures, etc.

Due to the limitations of this study, the cost estimation techniques in construction projects were just introduced. The cost estimation sub-sections that are the same in all techniques are shown in **[Figure- 4]**.

The most common techniques to estimate the project cost include:

- Similar estimation
- Bottom-up estimation
- Parametric estimation
- ABC-based activities estimation
- Resource cost rates estimation

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                        ┌─────────────────┐
                        │      Cost       │
                        │   estimation    │
                        └─────────────────┘
                                │
         ┌──────────────────────┼──────────────────────┐
   ┌───────────┐         ┌───────────────┐        ┌───────────┐
   │  Outputs  │         │  Processing   │        │  Inputs   │
   │           │         │ techniques and│        │           │
   │           │         │     tools     │        │           │
   └───────────┘         └───────────────┘        └───────────┘
```

Outputs
5. Estimates of costs
6. Other Details
7. Cost Management Plan

Processing techniques and tools
1. Comparative estimation
2. Parametric models
3. bottom up estimation
4. Computer techniques

Inputs
1. Work Breakdown Structure
2. Required resources
3. Resources rates
4. task durations estimation
5. Years of employment
6. Accounts list
7. Risks

Fig: 4. Cost estimation sub-sections in cost management

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Cost Budgeting

This process allocated the total estimated cost of the project to the amount of work for each project activities or its work packages. Cost budgeting provides the possibility that the amount of project performance to be assessed and measured in the future by creating a cost base line. Executive realities may obligate the mentioned estimations after the project approved funding. However, the implementation of such estimations should be done before the project budgeting request and it should be done any time [2]. Budgeting in a simple word is estimating the required resources in organizations, their required amount and time and costs. Budget ties the project to the objectives of organizations and the organizational policy prospects [3]. In this section, the cost budgeting techniques in construction projects were just introduced. The sub-sections that are the same in all techniques are shown in [**Figure- 5**].

The most common budgeting techniques in project cost budgeting include:

- Cost aggregation
- Bottom-up budgeting

• Reserve analysis
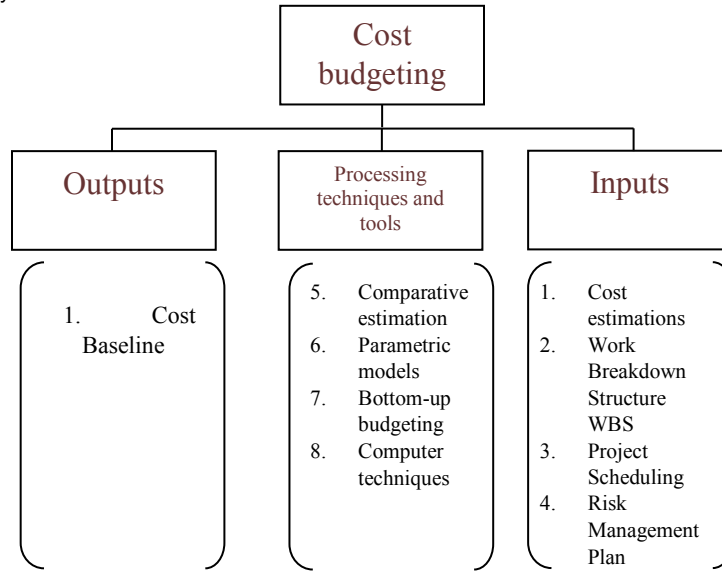
Fig: 5. Cost budgeting sub-sections in cost management

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Cost Control

Cost Engineering Association of America defines the cost control as following:
".Process application to observe the cost and performance against the project progress or production operations for measuring the difference between the authorized budgets and allowing effective actions to achieve the lowest cost." [1]

Earned Value Management System is used as the most important cost control technique in projects. Cost control sub-sections are shown in **[Figure- 6]**.
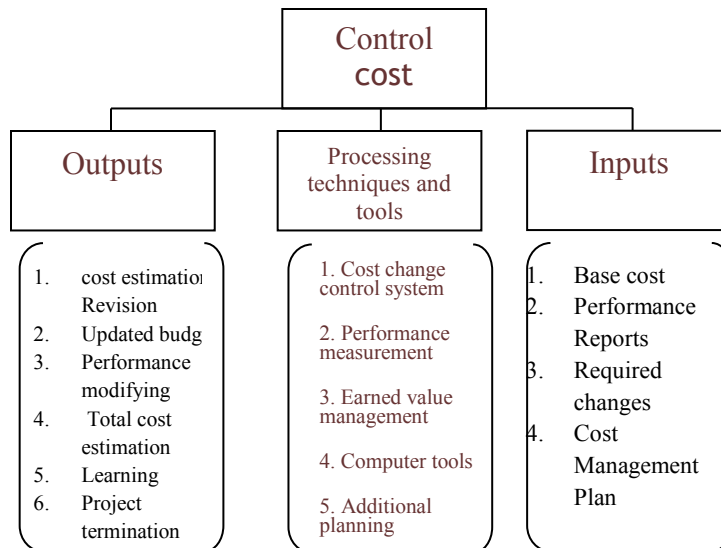
Fig: 6. Cost control sub-sections in cost management

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RESULTS AND DISCUSSION

With the development of technology and various methods of construction and creating changes in project implementation systems, contractor companies have been faced with such a complexity and rapid changes, that management cannot lonely have a sufficient knowledge of the environment in the project. For these and other reasons, managers cannot perform their duties. By relying their personal experience and even reflected information in financial statements. Hence, a system is required to help the management to identify the problem and possible solutions, to assess these solutions, to select an optimal solution, to implement the solutions, and their control and evaluation.

Cost-time balancing problem

Cost-time balancing is one of the important issues in project control and planning. The purpose of this problem is the transactional analysis of a variety of project costs and project execution time. In computing the project scheduling, the earliest completion time of the last activity is usually considered as the project delivery date. On the other hand, the project completion time is met based on a series of internal or external restrictions or requirements. In such cases, the completion time can be reduced by following ways:

- Shortening the project completion time through revising the network logic (implementation of some critical activities in parallel)
- Shortening the implementation duration of critical activities to spend more cost or compression [4]

As we know, the costs of implementing an activity (and therefore the cost of full implementation of the project) show different behavior against increasing or decreasing the time. In the overall analysis of project costs, initially, the cost-benefit analysis can be considered in relation to the direct costs of the project. Although the project time reduction leads to high direct costs because of increasing the resources related to project activities, but it has many advantages such as avoiding late penalties, faster operation and more than project product, and reduction of project risks. In addition, the time value of money is also an effective factor in projects. Thus, by reducing the project time, it will be possible to begin flowing the involved capital and increasing the profitability for project investors. On the other hand, the limitation for project time reduction should be considered. This means that by increasing resources and spending more costs in some activities, we reach an extent point, in which the possibility of further time reducing is not possible, or the cost of this time reduction is not reasonable due to project dimensions.

Since 1950, CPM method has widely been used for project control and planning. The main objective of the CPM method is to determine the amount of possible time to carry out a specific project. However, in a real project, project activities should be planned given the resources (such as labor force, materials, equipment, etc.). However, the duration of an activity can be defined as a function of the available resources. Furthermore, combination of various sources has certain costs. Finally, the project planner should create a balance between project costs and its time. Finding the most economical method of carrying out the project in a specified time (as well as finding the shortest time to implement the project with specific budget) is a problem that many heuristic and mathematical algorithms have been created to answer it. These models are usually focused on certain solutions. However, many uncertain factors dynamically affect activities in projects, which may change the time and cost of the project implementation. Some of these factors include: the level of productivity, weather conditions, etc. Various methods such as PERT and Monte Carlo simulation have been developed to solve this problem. These methods rarely provide an answer in providing cost-time balancing [5].

Recently, a number of researchers have used some of the computational methods such as Genetic Algorithm and Simulated Annealing for solving the cost-time balancing problem in construction projects.
Siemens algorithm or cost-effective slope model is explained as one of the most widely used methods in cost-time balancing problem.

1. **Siemens algorithm for cost-time balancing problem**
   Siemens algorithm provides a way to find a proper combination to reduce the activity time so that the project can be done on the specified date and at the same time, the amount of additional costs for the time compression to be at least possible [6].

The definition of Siemens symbols that are used in the algorithm is as follows:

1. Cost factor:
$$c_{ij} = \left| \frac{C_f - C_n}{D_n - D_n} \right| \qquad (1)$$

2. Path length
$$D_p = \sum D_{ij} \qquad (2)$$

3. Reductionable time of activities:
$$TA_{ij} = D'_n - D_f \qquad (3)$$

In which, Cf and Df are compressed time and cost and Cn and Dn, respectively, are the normal cost and time of activity. (In this relationship, D'_n is equal to the current time of activity ij.)

(It should be noted the purpose of the path in this paper is the critical path or CPM, which is usually the longest path of project activities.)

4. It is said the path is short enough when the project can be completed at Tp date and therefore there is no need to further reduction of the time.

5. **Effective Cost factor:**
$$EC_{ij} = \frac{c_{ij}}{N_{ij}} \qquad (4)$$

In which, Nij is the number of paths that ij activity is done on it and they were not shortened enough.

6. **Path reduction**
7.

$$TR = \begin{cases} \text{the current path length} - T_p & \text{(current path length} > if T_p) \\ \text{zero} & \text{(if)} \leq T_p \text{current path length} \end{cases}$$

The stages to optimize and shorten the duration of the project (to expedite working or lag compensation)

Step 1: preparation of CPM based on regular times.

Step 2: specifying the paths, which are not short enough and determining the necessary time reduction (TR) for each path.

Step 3: separating all activities, which are in at least one of the specified paths and noting cost and time reduction coefficients.

Step 4: calculating the effective cost coefficient for identified activities in Step 3.

Step 5: Choose an activity that has the minimum cost-effective coefficient for the paths that have the maximum time reduction. If two or more activities have equal conditions, follow these priorities:

A) Choose an activity that is on a larger number of not short enough paths.
B) Choose an activity that has the maximum time reduction.
C) Choose one of the activities randomly.

Step 6: shorten the activity ij that was selected in Step 5 up to the maximum amount. This maximum reduction is equal to the least following values:

A) Reductionable time of activity ij
B) the minimum amount of the necessary reduction for the paths that are not shortened enough and include activity ij:
$$Min\ (TA_{ij}\ [min(TR)]) \qquad (6)$$

Step 7: increase the time for activities that have been shortened more than the necessary amount to the amount that does not create new not short enough paths.

Step 8: If all paths were short enough, stop; otherwise, recalculate the effective cost coefficient for activities that are on not short enough paths.

Step 9: Go back to step 5 [6].

There are other algorithms for cost-time balancing, which will a near-optimal answer by removing a part of the possible space. Generally, linear programming can be considered as that the best method in terms of accuracy, but problem formulation in this way is time consuming and the answer cannot be achieved quickly. Compared with other classical algorithms, Siemens algorithm can achieve the final answer with a better speed and the answers will have a better accuracy.

CONCLUSION

In this paper, a different series of concepts related to cost and cost management were introduced and studied. The mentioned concepts are general, which will be discussed in the cost management process in various projects. At the end of this section and among the engineering concepts that are discussed in Project Cost Management, time-cost balancing in construction projects has been evaluated as one of the most important cases. This discussion can help project managers to accelerate the work or lag compensation. Then, it has been tried to introduce the most important efforts, which have been done until today in providing cost-time algorithms in the form of classic and new (heuristic) algorithms. Obviously, the detailed review of all these algorithms in the limited volume of this paper is impossible. Thus, it has been tried to explain the main concepts related to these algorithms and a summary of assumptions and their application in the form of one of its kinds in the name of Siemens algorithm or the effective cost slope model. This algorithm makes it possible to compress the project time in an applied mode that imposes the least cost to the project.

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ENGINEERING

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THE PROPOSED APPROACH FOR LOAD BALANCINGOF NODES IN THE CLOUD COMPUTING, USING A COMBINATION OF IMPERIALIST COMPETITIVE ALGORITHM AND GENETICS

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ABSTRACT

Internet has had a lot of progress from the beginning of its career so far, and has been causing changes in human life. Cloud computing service is one of the recent changes in the way the Internet works. Due to its features, this new technology has progressed quickly because in cloud computing all kinds of facilities, are provided for the users as a service. Naturally, any change and any new concept in the world of technology, has problems and complexities of its own. The use of cloud computing is no exception. It has caused enormous challenges for the experts in this field. Load balancing, security and reliability of the data are some of these challenges. In this study a combination of Imperialist Competitive optimization Algorithm and genetics is used for scheduling jobs and resources in cloud computing. The proposed method uses a combinatorial algorithm, which makes it easy to schedule and plan, causes the jobs to be processed in the minimum possible time, and makes the resources of the network to be balanced. Given the importance of load balancing process in the cloud computing, the aim of this thesis is to assess the process and compare the discussed methods in this field.

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INTRODUCTION

Using resources, cloud computing, provides the data, software, and equipment subscribing to a service requested by the client at a certain time. Of course, the length of time generally used in the Internet. The Internet can be considered as a cloud; operating and capital costs can be reduced by using cloud computing [1].

Each node in the cloud can be loaded in an inconsistent way of jobs being determined by the amount of work required by the customer. This phenomenon can significantly reduce the cloud performance; for some nodes that are loaded too much, spend more time to complete the job when compared with a node with less load under the same cloud. This problem is not only limited to one cloud but is related to any network such as a table, etc. as well. In The study, to have a better load distribution among the nodes we use a combination of genetic algorithm and Imperialist Competitive Algorithm. The recent cloud computing combines many nodes and provides services to users. There are many cloud computing service providers (CCSP) such as Google, Amazon and so on. Because they store cloud services as programs in their nodes, they can charge the customer with the primary information [2]. Therefore, the main defect of the cloud is in the fact that if the service providers have a slow speed because of traffic load or any other factors, the customers tend to refer to other service providers. A cloud is composed of different nodes that perform calculations based on customers' needs. The customers' requests can be attributed to random nodes so they can change their size and the load of the nodes can vary. So each node in the cloud can be loaded in an inconsistent way of jobs being determined by the amount of work required by the customer. This phenomenon can significantly reduce the cloud performance; for some nodes that are loaded too much, spend more time to complete the job when compared with a node with less load under the same cloud. This problem is not only limited to one cloud but is related to any network such as a table, etc. as well [3].

The load balancing of a network is one of the most difficult issues that must be done in the cloud computing system, the purpose of load balancing is to distribute the workload evenly across two or more computers, network

links, CPUs, hard drives, and other resources. This is in order to achieve optimal utilization of resources, maximize throughput, minimize response time, and avoid overloads. The balance of resources is defined as a non-deterministic polynomial complete problem. Network resource management is a very challenging job because the shared resources are distributed and heterogeneous [4].

The main research question is;

Is load balancing of nodes in cloud computing done dynamically and intelligently and are good results achieved?

In this study, we sought to solve this question.

In this article we follow four hypotheses to be able to control the balancing of the load between different nodes in cloud computing; this will increase the popularity and efficiency of cloud computing technology.

1. Load balancing of nodes in cloud computing is done dynamically and intelligently and good results are achieved?

2. Genetic optimization algorithm and imperialist competitive algorithm are used to perform load balancing of nodes in cloud computing.

3. Balancing load of nodes is optimized in terms of speed and time when combining the Genetic optimization algorithm and imperialist competitive algorithm.

4. The comparison of the results of nodes' load balancing in cloud computing is done by combining imperialistic competitive algorithm and Genetics, and other certain algorithms are also used for optimization.

The imperialistic competitive and genetic optimization algorithms are combined here to achieve the above hypotheses successfully. There are different types of algorithms that can be used to balance resources in the grid computing system. Colorni, Dorigo, and Maniezzo (1991) used genetic algorithm and Tabu 9 to solve the problem of load balancing of network offers in a dynamic environment[2]. A study conducted by Humo and Saeed (2013) have studied on Towards a Reference Model for Surveying a Load Balancing [5]. The strategy of load balancing combination uses the successive jobs combined by static and dynamic load balancing strategies, which are offered in the study of Pavani and Waldman, 2006 when combining GA with FCFS. Lorpunmanee et al. (2007) presents ant colony optimization for job's dynamic programming in-network environment and aims to minimize the total time delay[6]. The ant colony optimization is used in another study on network's load balancing [3]. In the paper of Kumar and colleagues, the load balancing of nodes in the cloud is conducted by the use of ant colony optimization and has had good results [2].

MATERIALS AND METHODS

This method focuses on the reduction of the calculation time of each job and at the same time on the balance of all available resources in a network environment. This method, selects the resources based on the number of countries. A matrix is used which contains the number of countries in each resources in order to facilitate the selection of appropriate resources for processing jobs. The method contains four main components of the network information server, network resources server, jobs and resources; it works as described below:

1. User sends a request for the processing of work. The Information about the total number of jobs, the size of each job, and CPU's time required per jobs are included in each request.

2. Network resources' server, begin to calculate parameters related to the program works after receiving messages from users. In addition, the Information Server provides resource information for the network resources' server.

The largest amount of matrix' input (PV), will be selected through the proposed method to supply the proposed work process. The local updating of countries is done after assigning a job to a resource.

The global updating of the countries takes place after the resource completed a job. Results will be sent to the user. In the proposed method, a country (particle) represents a network system. Network resource' server obtains the available resources from the server of the network information. Particles move randomly in the network system and check the status of each resource. The value of particles at the source, show the capacity of each resource in the network system. The value of initial particles (countries) of each resources for each job is calculated based on an estimated transfer time and runtime of a jobassigned to that resource. The estimated transit time can be achieved by

$$\frac{S_j}{bandwidth_r}$$

In the above equation S_j is the given job's size, bandwidth$_r$ is the available bandwidth between the server of the network resource and the resource. The initial particle is determined by the following formula:

$$PV_{ij} = \left[\frac{S_j}{bandwidth_r} + \frac{C_j}{MIPS_r * (1 - load_r)} \right]^{-1}$$

In the above equation, PV_{ij} is the amount of particles for the job of j assigned to the resource r. C_j is the amount of cpu required for the job j. $MIPS_r$ is the r resource's processor speed, and 1- load is the current load of r resource. Time, processor's speed and bandwidth can be obtained from the server of network information.

Suppose there are n jobs and m resources in PV Matrix:

$$PV = \begin{array}{c} \\ r_1 \\ r_2 \\ .. \\ r_m \end{array} \begin{array}{cccc} j_1 & j_2 & .. & j_n \\ \left[\begin{array}{cccc} PV_{11} & PV_{12} & .. & PV_{1n} \\ .. & .. & .. & .. \\ .. & .. & .. & .. \\ PV_{m1} & PV_{m2} & .. & PV_{mn} \end{array}\right] \end{array}$$

When fully processed, the local update and then the global update of particles (countries) is conducted to recalculate the entire PV matrix. After a solution was found for all particles, the routs of countries are updated according to the following formula.

$$\tau_{ir}(t+1) = (1-\rho)\tau_{ir} + \rho\Delta\tau_{ir}^{--}$$

In the above equation $\Delta\tau_{jr}^{best} = 1/L^{best}$ is the permitted countries added to the particles that may be the best duplicate solution or best global solution. If a particular resource is often used as the best solution, it will receive a larger amount of particles and recession will occur. Therefore, to avoid recession, upper and lower limits of each resource are applied on the possible strength point of the particles. The limitations of the imposed routs have an effect on the limitations of possible P_{iu} of the selected u resource, when the particles have a distance of [pmax, pmin] in the I resource; $0 < p_{min} \leq p_{ij} \leq p_{max} \leq 1$. A resource with smaller limits of a sequence is of less interest for being selected for jobs. Because the resources with more limits of a sequence are preferred [3].

In this experiment three jobs (J_1, J_2, J_3) are processed by three resources (R_1, R_2, R_3). The volume of each job is 15MB, 10MB and is 5MB; the information needed for the resources will be specified as well. It will be conducted for the jobs with higher volumes and the results will be compared with pso, Fa and ANT COLONY algorithms [3].

In the present study, we have used the idea of Husna Jamal, Ku Ruhana (2010) which has implemented the ant colony algorithm in the mesh processes. Using a combination of imperialistic competitive algorithm and the Genetics, we have presented a new idea for the balancing of the node's loads in cloud computing.

As described in the previous section we have used ICA and genetics which are two separate algorithms. in this section, we attempt to combine these two algorithms and categorize the new algorithms' jobs to have a better performance in terms of efficiency. According to researches of Lee, Leu, Chang (2011), some resources form a subfolder, and the combination of these several subfolders form a larger cluster. For each of these large clusters there is a local scheduler[7]. Jobs should be divided between them in a balanced way; there is an interface port for users to provide jobs. Information Server discovers registered resource's nodes. Global scheduler receives job, applies load balancing for each node (cluster), and Selects a larger cluster. Now the local scheduler selects a resource with the most powerful computing power among these sub-clusters to perform a given job. Upon completion of the implementation of new resources' jobs, the result of the implementation will be sent to information server. The global scheduler collects data from the information server, uses them to calculate the clusters' weight, and applied balance of loads. The weight of each large cluster is stored in the scheduler and scheduler uses it as a parameter for the new algorithm. The initial weight of each major cluster can be achieved for each job. The difference is that instead of using the CPU's speed, the average speed of the resources' processor or the average load of each major cluster's sub-clusters are used. In each replication, we select the major input of matrix, assuming that PI_{ij} is selected. Job j selects several sub clusters with the fastest average of computing power to be implemented; it is obtained through the following equation [7].

$$ACPi = \frac{\sum_{k=1}^{n} CPU_{SpeedK}{}^k * 1}{N}$$

CPU_Speedk is the processor's speed of resource k in the sub cluster i. CPU_K is the productivity of the current processor of the resource k in the sub cluster of i. n is the number of resources in the sub cluster I. Then the scheduler in each selected cluster selects a resource with the fastest-average computing power and the resource that runs faster sends the result. After the work is assigned to a resource, the local update (row) is applied in the matrix pi. The global updating reflects the changes in network conditions and the status of resources after a job completion. In the proposed approach, the scheduling of jobs is implemented

optimally and it will not exceed the considered time for the job. The optimization of scheduling is done through the combination of imperialist competitive algorithm and genetics. The differences in our methods and others' can be studied from two fundamental aspects:

- Time, speed and accuracy of the job
- Obtaining answers in the initial performances

The advantage of the combination of these two algorithms is that the scheduling of the jobs is done with the speed and accuracy. It should be noted that it can also be implemented with other programming languages such as C #, C ++, Clod Sim and other languages. Here we have used the programming language of MATLAB. The simulation results are given in the next section. In the proposed procedure, 50 percent of the countries have used the policy of assimilation to move towards the imperial power and the remaining 50% have used the combining method in the algorithm. Details of the procedure are as follows.

1. Establishment of the countries, initialization and evaluation of the countries
2. The determination of colonizers and the allocation of colonies to them in order to form an Empire
3. The Move of colonies toward the colonizers
3.1. fifty percent of the countries have used the policy of assimilation to move towards the imperial power
3.2. Fifty percent have used the combining method shown in **[Figure- 1].**

C_{ij}	0	1	1	0	0	1	1	0	0
Im_j	0	0	1	1	1	0	1	0	1
G_imp	1	1	1	0	0	1	0	0	1

New-con1	0	1	1	0	0	1	1	0	1
New-con2	0	0	1	0	0	1	0	0	1
New-con3	1	1	1	0	0	1	1	0	0

Fig: 1. Create new country with combining method

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Here, C_{ij} is the ith country in the Jth Empire

Im_j: Jth Empire's clonizer

G_imp: the colonizer of the best Empire

New- con 1,2,3: the new established countries

Each of the three new countries that are less expensive than C_{ij} would be replaced with it.

4. Revolution
5. In- group competition
6. Out-group competition

RESULTS AND DISCUSSION

In this section, we implement our method. The implementation involves the fact that the load-balancing problem in MATLAB is simulated and modeled. To demonstrate the combination of imperialist competitive algorithm and genetic algorithm, we have considered two small, medium and large systems. The existing issues are implemented by a combination of genetic algorithm and imperialist competitive algorithm. At the end of the simulation results are analyzed.

Implementation on the small system

Husna Jamal, Ku Ruhana (2010) have implemented the ant colony algorithm in the mesh processes to balance the nodes. In this experiment three jobs (J_1, J_2, J_3) are processed by three resources (R_1, R_2, R_3). The volume of each jobis 15MB, 10MB and is 5MB; the information needed for the resources will be shown in **Table- 1**.

Table 1: Information on resources

Status	R1	R2	R3
Processor speed(MIPS)	250	540	600
Bandwidth(Megabits/s)	15.40	35.50	42.37

According to the simulation results of 5, 10, 15 MB jobs, the Cpu Time assigned to each of the many different resources is shown in **Table- 1**. Then in the **table- 3.5** we have shown the amount of bandwidth of each load and in Table 1 we have indicated the percentage of each resources' capacity allocated to different loads..

Table 2: Cpu Time assigned to each load

			J1	J2	J3
Cpu Time	C	1	0.3160	0.5949	0.4894
		2	0.6740	0.4485	1.4906
		3	0.1994	1.3634	1.7244

The servers of network resources in matrix PV select the maximum amount of countries PV22. So R2 processes J2. After the assignment of J2 to R2, the local updates of the countries occur in the second row of R2. The third column is no longer needed because it is assigned to J3. The new PV matrix is as follows:

Table 3: The amount of bandwidth of each load

			J1	J2	J3
PV	BND		1.5983	6.1992	7.6025
			3.4372	4.5950	27.4678
			1.0003	14.0948	27.2749

Table 4: The resources' capacity allocated to loads by resources

			J1	J2	J3
load		1	44.3037	41.1517	14.5446
		2	28.3941	21.7003	49.9056
		3	52.9694	30.5203	16.5103

Based on 10 times of implementation of the program by different algorithms, the convergence results were extracted in **Table- 5**.

Table 5: Comparison of different algorithms in medium system

algorithm	convergence results
ICA-GA	7.6851
PSO	9.0633
ANT COLONY	10.49581
Bee Colony	11.1226

The convergence of the algorithms is presented in **Figure- 2**.
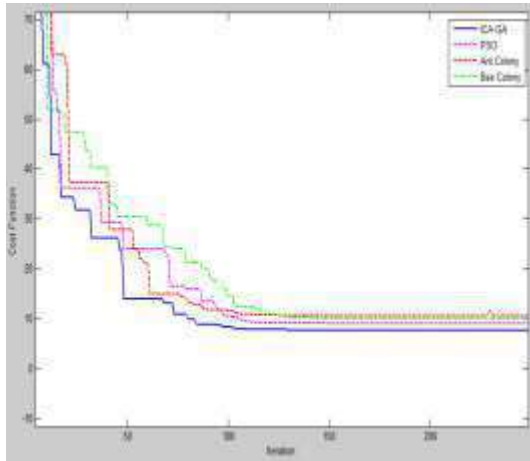
Fig: 2. Comparison of objective function's convergence chart using different algorithms of small systems.

The objective function's separated convergence Chart is presented in **Figure- 2** using the combined genetic algorithm and imperialist competitive algorithm;
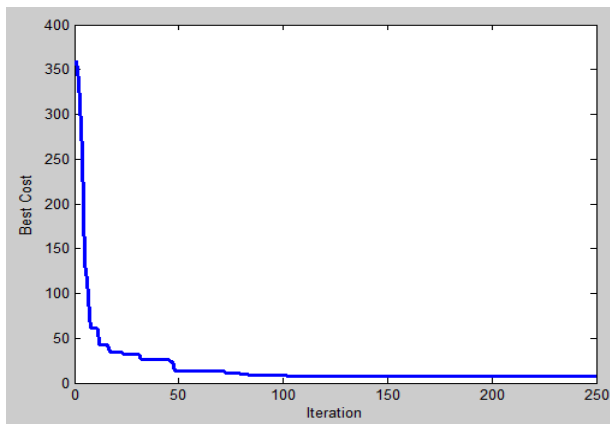
Fig: 3. The objective function's convergence chart using the combined genetic algorithm and imperialist competitive algorithm in the small system

Implementation on the medium system

In the experiment conducted on the medium systems, the sizes of jobs are increased. According to the existing conditions, the ability of the combined algorithm is assessed. In this experiment five jobs (j1, j2, j3, j4 , j5) are evaluated by (R1, R2, R3, R4, R5) resources. The volume of each jobs is 150.60 Mb, 210.40 MB, 230.80Mb, 260.75 MB, 290.40 MB. The data is shown in **Table- 6**.

Table 6. Information on resources

status	1	2	3	4	5
Processor speed(MIPS)	20	50	10	67	70
Bandwidth(Mega bits/s)	8.56	3.20	1.22	7.36	2.47

Like the previous sections, the Cpu Time assigned to each of the many different resources is shown in **Table- 7**. Then in the table 8 we have shown the amount of bandwidth of each load and in **Table- 9 we have indicated the percentage of each resources' capacity allocated to different loads.**

Table 7. Cpu Time assigned to each load

		J1	J2	J3	J4	J5
Cpu Time	R1	0.212	0.0356	0.0340	0.0324	0.0356
	R2	0.0317	0.0278	0.0690	0.0094	0.0430
	R3	0.0141	0.0125	0.0105	0.0092	0.1050
	R4	0.0289	0.0175	0.0703	0.0830	0.0319
	R5	0.0138	0.0951	0.0034	0.0460	0.0803

Table: 8. The amount of bandwidth of each load

		J1	J2	J3	J4	J5
BND	R1	3.2263	7.6893	8.1223	8.8096	10.7125
	R2	4.8447	6.0538	16.8464	2.4688	12.9864
	R3	2.1417	2.6470	2.4508	2.4215	41.5589
	R4	4.5353	3.7242	16.8213	22.8362	9.4430
	R5	2.0928	20.7547	0.7854	12.3345	26.5026

Table :9. The resources' capacity allocated to loads by resources

		J1	J2	J3	J4	J5
load	R1	17.8631	8.4333	26.2854	36.6571	10.7612
	R2	2.2688	49.2235	16.8371	26.9520	4.7185
	R3	3.0346	3.8843	15.3693	6.1689	72.0430
	R4	76.2703	9.6197	0.4309	11.4461	2.2330
	R5	3.8351	2.5599	5.3386	23.2043	66.0622

Based on 10 times of implementation of the program by different algorithms, the convergence results were extracted in **Table -10**.

**Table 10. Comparison of different algorithms in medium system**

algorithm	convergence results
ICA-GA	0.961445
PSO	0.987957
ANT COLONY	1.066721
Bee Colony	1.090439

The convergence chart of algorithms is shown in **figure- 4**.
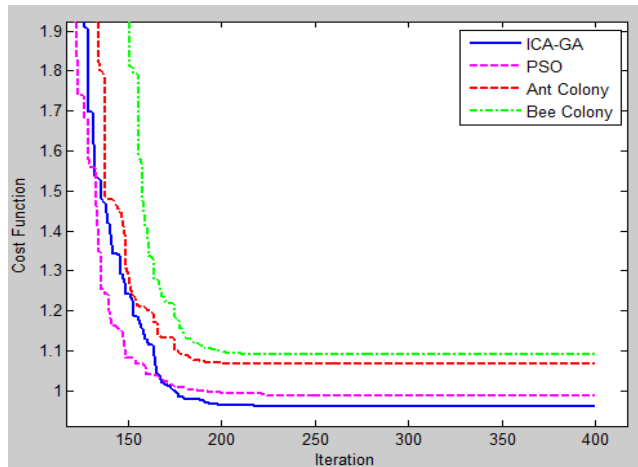
Fig: 4. Comparison of objective function's convergence chart using different algorithms of medium systems.

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The objective function's separated convergence Chart is presented in Figure 5 using the combined genetic algorithm and imperialist competitive algorithm;
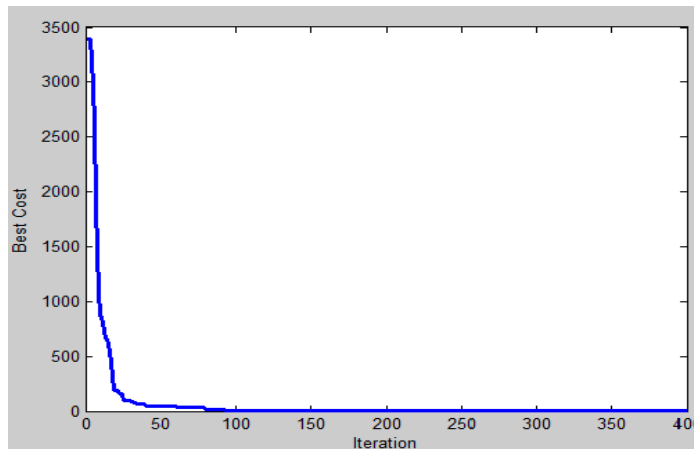
Fig:5. The objective function's convergence chart using the combined genetic algorithm and imperialist competitive algorithm in the medium system

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Implementation on the large system

In the experiment conducted on the large systems, the sizes of jobs are increased significantly. According to the existing conditions, the ability of the combined algorithm is assessed. In this experiment fifteen jobs (j1, j2, j3, j4 ,

j5, j 6, j7, j8, j9, j10, j11, j12, j 13, j14, j15) are evaluated by (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15) resources. The volume of each jobs is 150.60 MB, 210.40 MB, 230.8MB, 260.75 MB, 290.40 MB, 300.10 MB, 320.28 MB, 350.24 MB, 370.36MB, 385. 89MB, 400.27 MB, 420.45MB, 450.37MB, 500.87MB, 510.26MB. The data is shown in **Table- 11**.

Table 11. Information on resources

Status	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
Processor speed(MIPS)	470	490	505	520	560	590	605	620	680	715	745	810	850	920	940
Bandwidth (Megabits/s)	40.35	48.32	50.44	53.21	57.17	58.44	60.25	64.22	68.45	73.17	77.26	84.25	86.39	91.50	95.36

Like the previous sections, the Cpu Time assigned to each of the many different resources is shown in **Table- 12**. Then in the **Table -13** we have shown the amount of bandwidth of each load and in Table 14 we have indicated the percentage of each resources' capacity allocated to different loads.

Table :12. Cpu Time assigned to each load

	JJ1	JJ2	JJ3	JJ4	JJ5	JJ6	JJ7	JJ8	JJ9	JJ10	JJ11	JJ12	JJ13	JJ14	JJ15
RR 1	0.0440	0.0027	0.0045	0.0231	0.0118	0.0270	0.0050	0.0381	0.0324	0.0053	0.0174	0.2387	0.1695	0.0257	0.0853
RR 2	0.0250	0.0119	0.0224	0.0323	0.0343	0.0009	0.0993	0.0305	0.1054	0.1550	0.0369	0.0346	0.0024	0.0474	0.1365
RR 3	0.0481	0.0021	0.0003	0.0063	0.0329	0.1352	0.1820	0.0262	0.0798	0.1102	0.0294	0.0580	0.1622	0.0611	0.0030
RR 4	0.0128	0.0332	0.0027	0.0048	0.0005	0.0569	0.0695	0.0525	0.0544	0.1257	0.0181	0.0445	0.1628	0.0927	0.0964
RR 5	0.0591	0.0020	0.0106	0.0051	0.0215	0.0562	0.0672	0.0171	0.0181	0.0172	0.0240	0.0412	0.0935	0.0100	0.1069
RR 6	0.0221	0.0151	0.0088	0.0004	0.0449	0.1208	0.0257	0.1184	0.0376	0.0086	0.0588	0.0065	0.0860	0.0559	0.0950
RR 7	0.0003	0.0042	0.0067	0.0073	0.0129	0.0592	0.1565	0.0196	0.0190	0.0034	0.0351	0.0089	0.0411	0.1144	0.0782
RR 8	0.0016	0.0524	0.0060	0.0208	0.0118	0.0836	0.0436	0.0338	0.0210	0.0493	0.0562	0.1266	0.0331	0.0655	0.0312
RR 9	0.0290	0.0871	0.0876	0.0032	0.0036	0.0046	0.0275	0.0377	0.0552	0.0010	0.0991	0.0748	0.0955	0.1188	0.0133
RR 10	0.0019	0.0186	0.0017	0.0018	0.0386	0.0483	0.0200	0.0397	0.0005	0.0675	0.0926	0.0436	0.0772	0.0480	0.0168
RR 11	0.0017	0.0041	0.0012	0.0379	0.0005	0.0874	0.0734	0.0426	0.0697	0.0832	0.0381	0.0434	0.0128	0.0082	0.0056
RR 12	0.0074	0.0000	0.0595	0.0678	0.0127	0.0747	0.0060	0.0547	0.0410	0.0068	0.0150	0.0332	0.0200	0.0391	0.0152
RR 13	0.0306	0.0008	0.0040	0.0050	0.0061	0.0403	0.0033	0.0330	0.0361	0.0715	0.0276	0.0399	0.0155	0.0809	0.0005
RR 14	0.0213	0.0012	0.0000	0.0167	0.0036	0.0527	0.0061	0.0361	0.0614	0.0039	0.0188	0.0040	0.0572	0.0046	0.0693
RR 15	0.0062	0.0188	0.0120	0.0023	0.0093	0.0459	0.0330	0.0330	0.0573	0.0047	0.0113	0.0180	0.0471	0.0169	0.0171

Table:13. The amount of bandwidth of each load

	JJ1	JJ2	JJ3	JJ4	JJ5	JJ6	JJ7	JJ8	JJ9	JJ10	JJ11	JJ12	JJ13	JJ14	JJ15
RR1	6.7008	0.4103	0.6762	3.5087	1.7910	4.3127	0.7474	86.0294	5.0915	0.8024	2.6556	52.6924	28.9365	12.9899	24.4018
RR2	5.3025	2.5079	4.7519	6.8769	7.3323	0.1843	23.0863	6.6475	23.8110	55.8892	8.1319	7.5848	0.4994	12.8544	72.5551
RR3	11.3055	0.4841	0.0656	1.4587	7.7190	45.8637	85.3845	6.2008	37.9771	30.8815	7.2407	15.2647	54.1270	15.6991	0.6899
RR4	3.3553	8.7945	0.7044	1.2669	0.1349	20.4973	18.9956	14.5473	20.7743	84.2416	4.8806	41.6379	53.2575	40.1177	29.4406
RR5	17.7151	0.5943	3.0891	1.4999	6.3283	17.8928	20.5530	77.0436	5.4253	5.1440	10.7886	56.5153	30.7789	2.9912	68.7951
RR6	6.7107	4.5620	2.6629	0.1160	13.8561	40.1649	39.7263	58.6426	11.7655	2.5997	18.7000	1.9851	38.8454	21.6355	35.7309
RR7	0.0882	1.3445	2.1407	2.3524	4.1589	22.1683	67.0177	10.5059	10.6493	15.5330	12.5421	2.9266	16.5639	53.8381	31.0132
RR8	0.5604	18.9771	2.1153	7.3940	4.1836	31.9630	15.9661	12.2786	50.0215	18.6353	24.6947	61.9763	33.0540	27.3159	21.7825
RR9	10.9292	34.1249	34.6832	1.1841	1.3510	1.7982	55.7822	15.1004	22.5570	0.3735	44.1987	39.8748	43.3742	53.9561	8.9925
RR10	0.7150	7.3141	0.6643	0.6960	15.4423	19.8362	8.5600	16.0867	0.1911	30.7526	41.7835	40.1171	50.3858	20.3452	43.1821
RR11	0.6744	1.6474	0.4967	15.6133	0.1820	44.3453	52.4773	17.7882	33.6821	44.1450	22.2139	23.8796	5.2827	3.3191	28.7590
RR12	3.1082	0.0131	26.3544	30.3260	5.3860	41.2056	2.5513	33.6982	20.1077	18.6340	6.4425	20.2579	9.4532	17.6271	6.6603
RR13	14.1234	0.3625	1.7995	2.2565	2.7860	19.5149	1.4946	15.6708	17.0613	38.0188	13.9500	22.8710	21.9080	42.8395	0.2131
RR14	10.8759	0.6010	0.0117	8.5211	1.8075	28.8494	3.1012	19.4618	35.4440	1.9744	9.7167	26.1054	32.0745	2.5494	46.4209
RR15	3.1936	9.7577	6.1741	1.1781	4.8019	40.3329	17.5608	28.3050	31.3292	18.7702	7.8291	9.8201	27.2473	12.7487	11.2705

Table 14. The resources' capacity allocated to loads by resources

|	JJ1	JJ2	JJ3	JJ4	JJ5	JJ6	JJ7	JJ8	JJ9	JJ10	JJ11	JJ12	JJ13	JJ14	JJ15
RR1	5.4097	6.9926	41.2861	3.3916	0.6603	85.0141	15.3758	98.6915	73.7368	61.5674	35.8290	62.2924	22.4469	98.0231	90.2337
RR2	4.5428	9.5298	3.8282	0.8042	0.0128	73.2897	51.3154	60.1258	26.6601	73.8903	50.4620	40.1320	14.7691	84.0359	82.9017
RR3	0.6324	2.5743	6.8184	0.8024	0.3484	79.2074	81.6251	46.9339	91.8629	51.9589	69.6455	63.8710	56.6400	50.2213	61.3505
RR4	1.8644	5.0297	0.1827	2.5175	5.2988	88.5722	12.4873	50.2655	89.8316	82.1167	59.2009	94.6434	25.3598	78.2108	38.0879
RR5	6.0240	10.3703	9.5780	13.1658	16.1082	60.5282	13.1765	98.8705	59.4351	38.9202	94.3686	94.9470	18.0456	57.2288	79.6603
RR6	5.6510	1.6681	12.6523	1.7567	5.5275	20.6277	97.8723	80.8189	38.8156	15.7213	9.2768	47.3888	72.5051	73.2271	49.1528
RR7	0.4302	1.6483	0.9308	30.2104	1.8441	72.0040	55.8628	96.6830	96.7703	99.6076	69.4240	60.0895	77.1791	58.8536	53.3306
RR8	7.9172	2.6854	2.5115	11.1990	3.5633	25.4471	21.9333	28.0278	98.0367	22.6786	72.3280	48.0516	93.6158	48.4717	92.0923
RR9	5.7375	0.2028	8.0665	0.4537	2.6498	91.9848	97.2335	60.8610	50.7926	23.0077	38.3480	69.7251	31.4925	14.6086	96.0913
RR10	16.9452	27.4852	0.7465	2.5339	16.7469	34.6038	82.4211	32.6753	55.3497	43.2251	29.7322	90.3258	73.9485	26.4948	97.2593
RR11	2.1972	0.5474	0.1776	0.6162	22.8488	64.6773	85.1802	12.2760	63.1904	54.7811	86.0834	78.7264	40.2819	24.1498	99.1243
RR12	10.2035	8.3351	8.9450	8.1551	8.0315	71.9260	25.7436	84.5931	72.5418	98.8743	15.5106	85.0037	72.4046	11.2195	41.1056

Based on 10 times of implementation of the program by different algorithms, the convergence results were extracted in Table 15.

**Table 15. Comparison of different algorithms in the large system**

algorithm	convergence results
ICA-GA	9.19689
PSO	9.399799
ANT COLONY	11.42051
Bee Colony	11.43052

The convergence chart of algorithms is shown in figure 6.
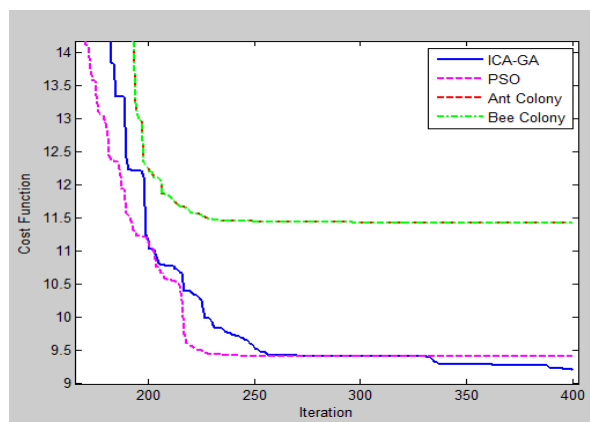
Figure 6. Comparison of objective function's convergence chart using different algorithms of large systems.

The objective function's separated convergence Chart is presented in Figure 7 using the combined genetic algorithm and imperialist competitive algorithm;

.
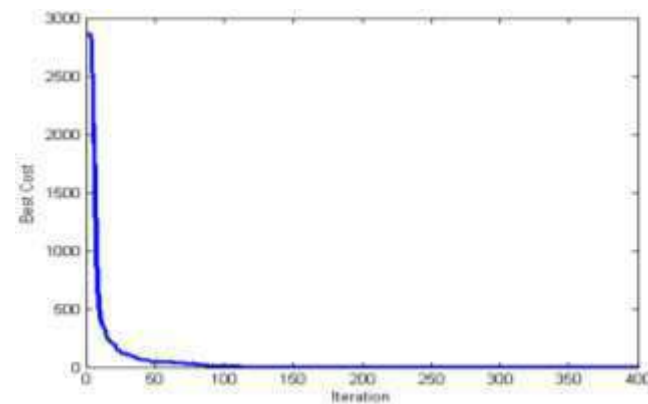
Figure 7. The objective function's convergence chart using the combined genetic algorithm and imperialist competitive algorithm in the large system

In this study, the combined algorithm of genetic and imperialist competitive was used to achieve load balancing in and network scheduling tasks. We implemented the combined algorithm on a series of hypothetical sets and examined the number of various tasks. The results show that the combination of genetic algorithm and imperial competitive algorithm remarkably balances the tasks between different nodes and achieves good results. Load balancing process in the proposed method is based on local updating of the countries. Local Updating of the countries reduces the value of the country in the dedicated resources. To ensure that the resource, in the limitation of the sequence, is less desirable for other countries, the permitted range of countries is limited to maximum and minimum power sequence.

CONCLUSION

This technique is used for controlling the amount of updated countries in each resource. The proposed method, is simply implemented because of the information from each resource and each job. By using this method, the load on each balanced resources and time of implementation on any job can be minimized. In this chapter we have introduced our methodology and resources needed for simulation are expressed. Then adjusting the parameters of the algorithm and various algorithms, we have shown the efficiency of our combined genetic and imperial competitive algorithm. Drawing convergence charts, we indicated the desirable efficiency of our combined genetic and imperial competitive algorithm. The results of the simulations showed that the combined genetic and imperialist competitive algorithm had a better performance than other algorithms.

Further studies are required to implement load balancing of nodes in combined cloud environments and examine the priority of the tasks policies of countries. Alternatively, other optimization algorithms can be used to implement this policy or e high speed and precision policies can also be added to this task.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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ARTICLE   **OPEN ACCESS**

PROMOTION OF THE QUALITY OF SOCIAL INTERACTIONS THROUGH SKELETAL DESIGN OF BUILDING COMPLEXES

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ABSTRACT

Aims: Following economic, political, and social circumstances governing the society and the building construction sector, high-rise buildings do not necessarily meet the criteria for desirable residential environments. Consequently, the design of mass and space is performed irrespective of the social interactions of the residents. In this vein, the present research mainly aims to propose approaches whereby social interactions are enhanced designing a residential complex promoting the quality of social life through establishment of suitable public and common spaces. The present research is both applied and descriptive-survey nature. A researcher-produced questionnaire is used to collect data. The statistical population consists of three building complexes: Moa'lem, Aryobarzan, and Mohandesin. Cluster sampling and Cochran formula were employed to select 235 samples. SPSS was also used to analyze data and to test out the research hypotheses in factor analysis. The results emanating from the analyses suggest that in terms of the physical dimension which exerts the most influence on the design revealing the design codes, the residents consider four factors as the most salient factors in social interactions. The present paper contributes to the literature on the topic in that it investigates the establishment of social interaction among residents of building complexes and the effect of architectural space designs in enhancing these relationships.

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INTRODUCTION

In recent years, interactional spaces are a prerequisite to the design and formation of architectural spaces whose influence reveals the role of these spaces in enhancing the socio-cultural character of the city. Social interactions and the establishment of relationships can be manifested in a physical context, a view, a conversation, and interpersonal exchanges all of which necessitate the definition of respective events and activities and consequently responsiveness of the people in spaces and their membership in social groups and networks [1]. The inappropriate and unsatisfactory conditions governing social life in some modern-day residential complexes, evident both in material and spiritual sense, necessitates the promotion of stabilized living conditions of social life emphasising principles of social sustainability. Open public spaces in residential areas provide the locality for social events and the groundwork required for interactions directly influencing the residents' quality of life. It is imperative to consider these social interaction centers as open public spaces and social interaction centers, as the most salient and the smallest social element of the city, play a pivotal role in social life. In this regard, the varied nature of residents' behavior and their respective needs necessitates the creation of spaces having an accurate, responsive and trustworthy design [2].

Eshghipour (2014) investigates various factors influencing social interactions in a multi-purpose commercial, cultural and recreational hub. These factors include: flexibility of spaces in a manner such that they be responsive to the needs of all the members of the community, appropriate lighting and special design conducive to attendance of women and children creating a sense of security in them, modern technology commensurate with local and temporal circumstances and behavioral, social, and cultural norms [3]. It is imperative to consider these social interaction centers as open public spaces and social interaction centers, as the most salient and the smallest social element of the city, play a pivotal role in social life. In this regard, the varied nature of residents' behavior and their respective needs necessitates the creation of spaces having an accurate, responsive and trustworthy design [4].

Considering the fact that the creation of desirable privacy for residents of each dwelling and the neighborhood in the context of interpersonal relationships suggests the enhancement of social interactions within the space, the provision, definition, and clarification of private, semiprivate, and public spaces in Iranian residences and

neighborhood relationships enhances social interactions. The appropriate physical design of internal spaces within each Iranian residence and adequate spatial communications of these residences with neighboring residences which ultimately form a district having desirable personal space complying with the individualistic culture and psychology of residents enhances social interactions among residents. Suitable quantitative and qualitative proportions for volumes and areas within Iranian residential spaces, crowding, adequate density, and number of households residing therein and adherence to the same proportions and ratios at the scale of neighborhood and district strengthens social interactions among attendance [5] all of which are of paramount importance in the physical design of residences.

MATERIALS AND METHODS

The present research is of an applied nature in terms of aims as it investigates the physical design of residential complexes to promote the quality of social interactions while it can be considered to be of a descriptive and survey type in view of its nature. The present research, a researcher-produced questionnaire is employed to collect data. The instrument consists of a number of likert-type questions including some eliciting demographic information. [6]

In general, the stages involved in conducting the present research are as follows:

Stage 1:
 selection of the residential complexes in Shiraz and specifying the qualitative data for the residences using qualitative indices, their analysis, and collecting questionnaires based on questions prepared with reference to these indices. [7]

Stage 2:
 classifying qualitative data and their analysis base on criteria such as fluency, perception, social effect, and content and analysis of these data using regression and factor analyses.

Stage 3:
 Analyzing the results and deriving the conclusions transforming the qualitative results to qualitative indices comparing and classifying them.

The present research employs descriptive and inferential statistics to analyze data to test out research hypotheses. Considering the hypotheses, factor analysis and the nonparametric tests such as the t-test, Kolmogorov test, and Smirnov tests were used in the SPSS software. The present research employs descriptive statisticsto analyze data and inferential statistics to test the research hypotheses. Factor analysis and parametric tests such as the t-testand nonparametric tests including Kolmogorov, Smirnovin SPSS are also used for this purpose. [8]

Research Hypotheses

The design elements in social sustainability such as liveliness, attendance, creation of common communal memories, sense of belongingness to the space, the opportunity for dialogue, face-to-face interactions, possibility to express views, opinions, and interests among the residents can exert effect on the skeletal design of residential complexes.

The design of specific communal spaces, appropriate access to communal spaces, signs, elements, and natural and artificial space-creation in the residential area can promote the quality of social interactions in the complexes. Presenting planning and design approaches for the layout of the communal spaces in the storeys and public open spaces can lead to the creation of desirable environment for residents promoting social interactions among them.
[1, 9]

RESULTS

Considering the level of influence, the four factors are classified and named in SPSS as follows:
1. Specific Public Spaces: This factor defines approximately 19 percent of the variance in the data being the most salient physical factor in enhancing social interactions in building complexes as viewed by residents. This factor includes the following variables: the existence of a location for convening, a location contemplated for delivering speeches, a location for the computer site, a location for artistic activities, and a library.
2. Access: This factor incorporates the following: adequate access to communal spaces, access to green spaces and adequate access to public spaces accounting for 15 percent of the variance in the data.

Signs and Elements: This factor accounts for 10 percent of the variance in the data including criteria for characteristic elements, waterfronts, and sculptures.

Natural and Artificial Space Building: This factor accounts for the appearance of residential complexes incorporating the following variables: natural characteristic elements, quality green spaces, playgrounds, and existence of spaces for leisure activities for different age brackets.

Table 1: Regression Coefficients

	Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.536	.130		4.120	.000
	Specific Spaces	.503	.135	.230	3.733	.000
	Access	.870	.164	.327	5.315	.000
	Elements	.172	.184	.058	2.234	.035
	Space-Building	.386	.180	.132	2.141	.033

On the basis of the table of coefficients **[Table- 1]**, the standard beta coefficient for each independent variable determines the significance of each one. The beta weightings are indicative of the variability of the dependent variable (i.e. level of social interactions) for variations for one standard deviation in the dependent variable.

As the level of significance of the test for equivalence of regression coefficients and the constant or the zero value is less than 0.05 no regression equations need to be ignored. In other words, the four dependent variables exert influence on the dependent variable. Accordingly, the effect of each factor on social interactions in decreasing order is as follows: Access (standard beta=0.870), specific communal spaces (standard beta=0.503), space-building (standard beta=0.386), and finally elements and signs (standard beta=0.172). To determine the reliability of the regression model, the colinearity test was employed. Colinearity represents a situation which indicates that an independent variable is a linear function of other dependent variables.

Table 2: The colinearity test

| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions | | | |
				(Constant)	Specific Spaces	Access	
1	1	4.077	1.000	.00	.02	.01	.01	.01
	2	.341	3.456	.00	.82	.02	.11	.05
	3	.277	3.835	.00	.01	.02	.59	.38
	4	.239	4.134	.00	.02	.59	.08	.31
	5	.66	7.847	.99	.13	.36	.21	.25

[Table- 2] depicts the eigenvalues and condition indices, respectively. Eigenvalues less than 1.0 reveal the high internal correlation of predictions. Thus, in view of the appropriateness of eigenvalues and condition indices, colinearity among independent variables is ruled out and the model is considered as being highly reliable. Results emanating from regression analysis suggest that "access" (standard beta=0.870), "specific communal spaces" (Standard beta=0.503), "space-building" (standard beta=0.386), and finally "elements and signs" (standard beta coefficient=0.172) occupy as the first through fourth priorities. Regression analysis was also conducted in the social dimension suggesting that the factor entitled "socio-economic harmony" (beta coefficient=0.429) was the factor exerting maximum influence on social interactions in the residential complexes under study. This factor was followed by "social assets" (beta coefficient=0.392), "satisfaction with space" (beta coefficient=0.352),

"security" (beta coefficient=0.295), and "open communal spaces" (beta coefficient=0.281). In sum, the results emanating from the colinearity test clearly support the fact that there is no colinearity among independent variables and that the model possesses high validity and reliability. [9, 10]

DISCUSSION AND CONCLUSION

The present research mainly aimed at identifying factors influencing social interactions in building complexes. Accordingly, to achieve the objectives contemplated in the study, factor analysis of physical and social dimensions was performed. In the skeletal dimension, which exerted major influence on design and represents design codes, the four factors "specific communal spaces", "access", "Signs and elements", and "natural and artificial space-building" were selected as the most influential factors in social interactions as viewed by building complex residents. Subsequently, regression analysis was performed to prioritize the factors involved as each factor plays a major determining role in the design process. Results from regression analysis suggest that "access" (standard beta=0.870), "specific communal spaces" (standard beta=0.503), "space-building" (standard beta=0.386) and "elements and signs" (standard beta=0.172) occur in the first through fourth priorities, respectively.

Factor analysis was also performed in the social dimension. This was because the social dimension exerts large influence on the level of social interaction in building complexes. Furthermore, the analysis of this dimension makes it possible to discover the salient points in design which influence the level of social interactions. Factor analysis in the social dimension revealed that five factors influence social interactions in building complexes which are: "social assets", "open communal spaces", "socioeconomic harmony", and "satisfaction with space", and "security". Regression analysis was also performed on this dimension with results suggesting that the factor "socio-economic harmony" (standard beta=0.429) is the most influential factor in social interactions within residential complexes. Following this factor are the factors "social assets" (standard beta=0.392), "satisfaction with space" (standard beta=0.352), "security" (standard beta=0.295), and "open communal spaces" (standard beta=0.281).

As was mentioned earlier, inattention of planners and designers of residential complexes to physio-spatial criteria in meeting human needs can cause serious consequences for residents the most salient of which are nonexistent neighborhood relationships among building complex residents and lack of social interactions among them. Considering the fact that the combination of functions and activities intended to establish spatial unity and various semi-private, semipublic, and public areas are regarded as groundwork for social interactions and relationships, appropriate design of these spaces and their suitable connection can play an effective role in enhancing the quality of human interactions in residential complexes.

Although public spaces play a pivotal role in strengthening familiarity and interactions among residents, living in apartments distances human beings from the natural environment. Thus, the creation of open and green spaces having scenic architecture and landscapes paves the way for the establishment of fruitful social interactions and communications. Furthermore, the creation of public spaces within the buildings and the juxtaposition of areas for residents' conventions in the evenings can promote interpersonal interactions and communications.

Given the analyses performed in the present research, it can be observed that the higher the quality ofpublic spaces in residential complexes the larger is the opportunity for social interactions following communal activities such as visiting, chats, games, exercise, ...rendering the spaces conducive to livelihood and civil life.

Access to these facilities is made feasible subject to numerous factors some of which are closely associated with the physical structure of the environment such as variety, compliance with functions, security, concentration, and adequate capacity. The physical groundwork can play a crucial role in establishing a lively and attractive environment provided these requirements and the qualitative specifications demanded by consumers are met. In other words, the establishment of the necessary qualities, the minimum requirements for creation of social interactions and hence increasing the likelihood of individuals' attendance in the environment as a starting point for communal activities and social interactions are provided.

CONFLICT OF INTERESTS

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None
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ARCHITECTURE

EVALUATION OF THE FLEXIBILITY OF PROFIT MANAGEMENT IN THE COMPANIES LISTED IN THE TEHRAN STOCK EXCHANGE

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ABSTRACT

This research studies theevaluation ofthe flexibility of profit management in the companies listed in the Tehran Stock Exchange. This research adds the analysis of the decisive factors of profit management flexibility to the theoretical literature.This discussion tests the various effects of profit management measures taken in the past on the company's ability to manage the profit and offers a new structure that combines all these factors. We developed six hypotheses to answer the research questions and selected 138 companies among the firms listed in the stock exchange during a six-year period from 2008 to 2013.This research is an applied research with regard to the research objectives, while the nature of the research is descriptive-correlational.We used multivariate regression to test the hypotheses.This study was based on real stock market information and its information was gathered throughyearbooks and the information software released by Tehran Stock Exchange as well as the fundamental financial statements and other reports and notes accompanying the financial statements. With the study of profit management literature, we realized that many researchers of this field have used discretionary accruals as a good replacement forprofit management's dependent variable.

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INTRODUCTION

The main objective of financial reporting is the description of economic effects of financial operations and events on the status and performance of the business units in order to help potential and actual users tomakefinancial decisions in connection with the business units. The main tool of information transfer to the aforementioned persons consists ofthe fundamental financial statements including the balance sheet, profit and loss statementand cash flow statement that are the final product of the accounting process and financial reporting. Financial reporting must provide useful and beneficial information for thepotential and actual investors and creditors and other users to enablelogical and investments decisions andaward credit, etc. In a nutshell, the primary purpose of financial reporting is preparation of on the performance of business units through the measurement of profit and its components. Basically, the investors, creditors and other people involved in the net future cash flow of the business unitshow particular interest in these types of information.Their interest in the future cash flow of the firm and its ability to create favorable cash flows primarily leads to concentration on the profit information rather than directly acquiring information about cash flows.Profit management in accounting literature is a topic discussed in the field of accounting profit.This accounting topic developedin the beginning of the 20thcentury based on various researches conducted by the experts in the field of accounting. Each of these researches has investigated the subject from different dimensions and with different lexicon such as profit manipulation, profit normalization, and finally profit management. Due to the notoriety of some companies, profit management has recently becomea subject of public attention and legislation authorities have also taken care of this issue and put in place several legal changes. On the other hand, the profit is calculated and recognized based on the accrual figuresand on the accrual basis, recognition isbased on the realization of the income and expenses, not cash reception and payment. Therefore, the accounting forecasts and allocationsare used in the calculation and identification of profit.Hence, the use of profit as the company's performance indicator is doubtful because of its vulnerability to different methods of estimating and accounting and the effect of theagency theory, while the cash generated by operations, due to lessmanipulation by the management, is a better criterion in the evaluation of the companies' performance.It is difficult to provide a clear definition of profit managementin the accounting literature because the border between the profit management of financial fraud is not specified. Financial fraud is intentional removal or manipulation of accounting data or original facts which besides the existing data may change the judgment or the decision of the data user. Flexibility in accounting allows this profession to do some processing. Deviations like profit management happen when people abuse such flexibility and these deviations are used to cover up actual financial fluctuations. Therefore, the real results of management performance will not be revealed. This research adds the analysis of the decisive factors of profit management flexibility to the theoretical

literature.This discussion tests various effects of the past profit management measures on the company's ability to manage the profit and offers a new structure that combines all these factors and a new flexible profit management structure based on changes (fluctuations) within the range of the applied profit management and flexibility is proposed and tested herein.

Importance and necessity of the research: Gary Giroux[1] argues thatthe profit management covers a wide range starting from conservative accounting to non-biased accounting and then continues with aggressive accounting and finally treacherous accounting.The important point is that there are numerous methods of profit management and the manager enjoys a great amount of freedom to managethe reported net profit in the framework of accounting standards.Also, for many of the accruals, disclosing the applied management of profit by the auditors will be difficult or if the auditorsalready know about it, sometimes they can't protest because most of the profit management techniques are within the scope of accounting standards. However, evaluation of profit management flexibility in a specific range is very important.

MATERIALS AND METHODS

Methodology of the research in terms of the objective: it is a type of applied research. Methodology of research in terms of the type of data: it is descriptive and describes the relationship between the existing variables using correlation coefficient and regression test. Methodology of research in terms of execution method: this study includes all the companies listed in the Tehran Stock Exchange. Regression analysis is used to test for the existence of a relationship between the independent variable and the dependent variable, as well as the significance of the models provided by regression analysis.

Research literature

Profit management definition:Profit management in accounting literature is a topic raised in the field of profit accounting.This accounting topic was raised in the beginning of the 20thcentury via various researches conducted by the experts in the field of accounting. Each of these researches investigated the subject from different dimensions and with different lexicon such as profit manipulation, profit normalization, and finally profit management. Due to the notoriety of some companies, the profit management has recently become a subject of public attention and legislation authorities have also taken care of this issue and put in place several legal changes. According to the declarationno. 1 of the accounting concepts of the council for financial accounting standards, profit applications are as follows:
-A criterion for evaluating the performance of management
-Using it topredict the future profit
-Evaluation of the company's profitability during the long-term future
-Estimation of the hazard of investment and credit allocation
On the other hand, the profit is calculated and recognized based on the accrual figures and in the accrual basis, recognition will be based on the realization of the income and expenses, not cash reception and payment. Therefore, the accounting forecasts and allocationsare used in the calculation and identification of profit.Hence, the use of profit as the company performance criterion is suspicious because of its vulnerability to different methods of estimating and accounting and the effect of agency theory, while the cash generated by operations, due to less manipulation by the management, is a better evaluation criterion of the companies' performance.There are various definitions of profit management in the accounting literature that are presented here:

Dividsondefines profit management as a process of taking intentional steps in the context of accepted accounting principles which enable managers to raise the reported profit to their desired levels.
Healy & Wahlen define the profit management as such: "profit management occurs when the administrators use their personal judgment in financial reporting and as a result, changes occur in the financial structure. These changes in financial reporting mislead the stakeholders with respect to the performance of the enterprise or affect the consequences arising from business unit contracts that depend on the reported accounting figures.Schipper [2]defines profit management as adeliberate intervention in financial reporting process in order to obtain personal benefit for shareholders and managers. When the profit management signals confidential information to the shareholders or when it is used to avoid renewed and costly borrowing contracts and thus, reduced political cost, the shareholders will benefit.Administrators can also use profit management to take advantage of shareholders like increase in remuneration and reducing the possibility of dismissal due to the poor performance of the manager.
Kaplan [3]argues that the manipulation of accounts is about the relative ability to reduce or increase profits reported by the managers. Titles such as maximizers, minimizers or normalizers implicitly refer to people who manipulate accounts and of course, manipulation of accounts covers a wider scope than what Kaplan had in mind. Like the method of classifying accruals in the profit and loss statement that has been raised frequently in accounting literature or cases related to the balance sheet which of course are less discussed.In fact, the importance of the manipulation of accounts is more than what Kaplan has mentioned. On the other hand, the subject of motivation of manipulation of accounts needs more attention. Sometimes managers use accounts as a means of falsely showing the unrealistic achievement of company's long-term goals or artificial reduction of potential risk.

Stolowy & Bertonpresented a framework for classifying various types of manipulation of accounts. This framework is based on the fundamental principle that the financial information has a major impact on reducingthe company's financial costs.This reduction shall be subject to investors 'perception of the risks of the company. In terms of computing, such risk is also estimated through the "Beta" coefficient which is a function of the relative profit diversion.

Degeorge et al. [4]define the profit management as a kind of artificial manipulation of profit by the management to achieve the expected level of profit for some specific decisions (including analysts' forecast or estimation of the previous profittrend to predict future profit). He argues that in factthe main motive of profit management is the management of investors' perception about the business unit.

Scott [5]defines profit management as the company's choice to select accounting policies that achieve certain specific objectives of the director.

Fern et al. [6]define the profit management as profit manipulation by the management in order to achieve a portion of the projected estimation related to the "expected profit" (such as analysts' forecast, previous estimates of management, or reduced dispersion of interests).

In a fully theoretical article discussed the topics related to the interests. It seems that the profit management is normally a result of director's use of informational asymmetry advantages of shareholders.This issue is the center point of the definition provided by Scott. Dye has raised at least two important issues in the aforementioned discussion. First, profits may be manipulated to increase the managers' rewards supplied by the investors. Secondly, the actual investors seek a better impression at the market about the company value.Therefore, a transfer of potential wealth from the new investors to old investors, which creates a domestic demand for profit management, may occur.

Hope &Hope believe when the companies go under increasing pressure in adverse economic situations, their managers ask the accounting department to raise the bar on the last row of financial statement (i.e. profit) and thus, change its information content. Accounting, despite all the flexibility, does not seem to be able to provide useful data for management in such conditions. The data needed for decision making is a very complex category because of the diverse range of its users such as the investors (since they need to know the rate of company profitability and stability before investing in it), managers (they need to know the financial status of the company), banks and financial suppliers (the need to know the company's ability to repay the loan)who require various information.

The profit management philosophy isthe exploiting of the flexibility of standard and accepted methods and accounting principles. Of course, various interpretations of execution methods of an accounting standard are another reason for profit management.This flexibility is the main reason of the variety found in accounting methods. When the standard interpretation is very flexible, there will be less integration of financial data. Conformity and conservatism principles can also be a cause of profit management. According to Getschow [7], the company must increase the profits of its 1st quarter of the fiscal year without adding to the cash inventory and only using the depreciation accounting accrual methods, investment tax exemption and placement of the interest in assets account.Company managers have been emphasizing that this process was aimed to present more realistic financial statements and making company's financial statements comparable to other companies in the similar industries.Financial analysts and auditors call this phenomenon an accounting trick.However, all of these measures have been practiced within the framework of accepted accounting principles.Yoon &Miller believe that managers of companies intentionally manipulate the reported profit with the use of specific accounting policies inclined to change the accounting estimations and accruals to achieve their goals. Collingwoodstated that financial analysts expect the companiesto meet theforecasts and do not encounter conflict; this is true for the companies that are more reliable.

Financial analysts and investors get very discontented by deviation between the predicted and actual values, these discrepancies are more used in profit management.In the case of negative discrepancies, the profit owners see the profit management a fraudulent act while in the case of positive discrepancies,they see it a righteous process according to the discretion of management.Argue that: "Unlike most people who perceive normalization an abuse of the flexibility in reporting, in our opinion wise managers that aim to increase the value of their companies raise the value of their company in the framework of legal and accounting requirements." On the contrary, if the data recorded in the financial statements change in a way to create loss for the profit owners, it is regarded the management fraud to seek his/her personal goals.

Research background

Zang [8] proved that if a company makes use of more accruals management in the past relative to other companies in the industry,it would enjoyless accounting flexibility in order to manage accruals during the current year.As a result, it tends to manipulate the profit via company activities.

Gunny[9]investigated the real profit management results using the four tools of reduced research &development expenses; lower administration, general and sales costs; increased non-operational profits resulting from the sale of long-term assets; and excessive production. He reviewed the active companies in the New York Stock Exchange during the years 1988 to 2000 and obtainedthe following two results:

1-Actual profit management leads to profit reporting and loweroperational cash flow.

2-Investors recognize the results of the actual profit management. In other words, if a company makes use of actual profit management in the current year, it will record low returns for the next year.

Roychowdhury'sresearch [10] showed that the companies, to avoid reporting of the annual losses, temporarily reduce the price of products in order to increase the amount of sale,increase the amount of production to reduce the cost price of the sold products, and reduce the optional expanses to improve the profit margin.

Chen et al.[11] studied the owner's interest the market granted to companies that used the accounting profit management or actual profit management to converge the result of their operations to the forecast of analysts.They studied8977 firms in the New York Stock Exchange during 1987-2006. The results showed that the market value is available to all the companies that use profit management to converge the result of their operations to the forecast of analysts but the reward dropped to one-third for the companies that use the actual profit management.

Kochki[12] examined the timing of asset sales and thus, the resulting profit, as one of the profit normalization tools to clarify whether the managers normalize the profit by using such tools? The statistical population of the research

consisted of the companies listed in the Tehran Stock Exchange during 1984 to 1993.The results indicated that the profit resulting from the sale of assets had not smoothed out the temporary changes in the profits.

Rakhshani [13]studied the asset sales timing and financial costs asprofit management tools in the companies listed in the Tehran Stock Exchange. The statistical population of the research consisted of the companies listed in the Tehran Stock Exchange during 1999 to 2002.The results indicated a significant relationship between the "fixed asset sales profit" and"profit before tax deduction minus the profit of fixed asset sales". Also, there was a significant relationship between the "financial cost" and "profit before tax deduction and financial cost".

RESULTS ANS DISCUSSION

Operational definition of the research variables

The model used for testing the hypotheses using the multivariate regression is described as follows:

$$TAccrual_{it} = \alpha_{it} + \beta_1 TAccrual_{it-1} + \beta_2 RR_{it} + \beta_3 GDP_{it} + \beta_4 Flex\_EM_{it} + \beta_5 lpb_{it} + \beta_6 CPI_{it} + \varepsilon_{it}$$

Where,
TAccrual: dependent variable of the research model's is theaccruals. The Jones model was adjusted to measure this variable:

$$\frac{TAccrual_t}{TAsset_{t-1}} = \frac{\alpha}{TAsset_{t-1}} + \beta_1 \frac{\Delta Sales_t}{TAsset_{t-1}} + \beta_2 \frac{PPE_t}{TAsset_{t-1}} + \beta_3 SG_t + \beta_4 Divid_t + \varepsilon_t$$

TAsset: total company assets.
ΔSales: this variable shows the variation of the company sales and it is calculated from the difference of current year's sales with the past year's sales.
PPE: net indicator of company's machinery, equipment and property.
SG: average sales growth of the company.
Divid: ratio of the company dividends.
It must be mentioned that in the relevant foreign article, the financial analysts' forecast was used as the dependent variable of the probit regression model.Therefore, due to the lack of financial analysts' forecast in Iran, the total accruals variable was used. The reason for choosing this variable was investigation of the explanatory and predictive capability of flexibility of accruals in Iran.
RR: accruals'rate of return. The following equation is used to measure this rate in the company's operational cycle:

$$Operating cycle = (\frac{AvgA/R}{Sales} + \frac{AvgInventory}{Cost of goods sold} - \frac{AvgA/P}{Cost of goods sold}) * 90$$

The operational cycle in this variable is the number of days required between the order and cash payment of the goods inventory and raw materials and stock sales (cash receipt from customers). The rate of return of discretionary revolving capital is the rate of return of discretionary accruals because the greater part of the discretionary accruals is a result of revolving capital accounts.
GDP: gross domestic production. Since the economic conditions create boom and bust in the company's business. Hence, this variable will be extracted from the reports of the Central Bank of the Islamic Republic of Iran.

lpb: this variable is simply the ratio of the market value to the book value of the ordinary shares.
CPI: consumer price index.Hence, this variable will be extracted from the reports of the Central Bank of the Islamic Republic of Iran.
Flex_EM: three separate criteria will be used for the calculation of the profit management flexibility.
A-Barton & Simko indicator – it is obtained from the net division of operational assets' flexibility by company sales. Net operational assets are equal to the shareholders equity minus available cash and negotiable securities, plus debt. A higher ratio means a lower flexibility.
B- Kasznikparameter – change in the total number of accruals. This flexibility parameter is obtainedby the difference between total accruals of the current season with the same season in the previous year divided by total accruals of the same season in the previous year. The total accruals are obtained by the difference between the profit before unexpected items and the cash flow resulting from operational activities.
C-The flexibility of operational cycle is obtained by the difference between upper flexibilitylimit with total discretionary accruals of Qi seasons. Qi is the number of seasons used in the company's operational cycle.
The following equation is used for the calculation of the accumulated delayed discretionary accruals:

$$CLDA_t = DA_{t-1} + DA_{t-2} + DA_{t-3}$$

The upper flexibility limit is obtained by the mean of accumulated delayed discretionary accruals plus twice the standard deviation of these delayed accruals. In other words,

$$UpperFlexibilityLimit = \overline{CLDA} + 2\sigma(CLDA)$$

So, the flexibility of operational cycle can be achieved by the following equation:

$$Flex\_EM = UpperFlexibilityLimit - CLDA$$

Descriptive indicators of the variables

[Table- 1] showssome of the concepts of descriptive statistics of variables,including the mean, median, minimum observations, maximum observations and standard deviation. The main central index is the mean that represents the point of balance and center of gravity of distribution and it is a good indicator for demonstrating centrality of the data.

For example, according to the table 4-2, the mean value for the total company assets variable is 2.5123 which shows most of the data is focused around this point.The median is another one of the central indicators that show the status of the population.It can be seen in the table 1 that the median of the variable of the total company assets is 1.8168 indicating that half of the data are less than this amount and half are higher than this amount. Standard deviation is one of the most important dispersion parameters and this indicator is used for thedispersion of the observations from the mean. The value of this parameter for the total company assets variable is 5.6765.

Table :1. Descriptive stats of the research variables for all companies

Variables	Number of observations	Mean	Median	Maximum	Minimum	Standard deviation
TAsset	685	2.5123	1.8168	71.0873	-15.9201	5.6765
TAccrual	685	.0..31	0.0062	0.8726	-0.4703	0.0999
ΔSales	685	1.0909	1.0784	2.3564	0.1623	0.2843
Ln PPE	685	0.7481	0.6131	3.1863	0.0396	0.4583
Flex_EM	685	3.9771	0.5751	216.3644	0.0012	17.2847
CPI	685	13.4469	13.2291	18.3163	9.8808	1.3865

Testing the correlation coefficient of the research variables

We define correlation as the intensity of dependence of two variables to each other. Generally, the correlation coefficients should be between -1 to +1. When the correlation coefficientgets closer to one, the correlation of the two variables will be higher. This dependency is not causation and the correlation coefficient does not say anything about which is the cause and which is the effect. We test for correlation to check the basic relationship between variables andaccording to the results,there is a relationship between variables and one may investigate these relationships more carefully.The results presented in [Table- 2] shows that there is a direct relationship between the quality of accruals and the future stocks yield.

Table: 2. Correlation coefficients of the research variables

Variables	TAsset	TAccrual	ΔSales	Ln PPE	Flex_EM	CPI
TAsset	1.0000					
TAccrual	0.0513	1.0000				
ΔSales	0.0360	-0.0197	1.0000			
Ln PPE	0.3129	0.0092	-0.3203	1.0000		
Flex_EM	-0.0354	0.0052	0.0213	-0.0069	1.0000	
CPI	-0.0098	-0.0006	0.1042	-0.0744	-0.2110	1.0000

Study of the research variables'stationarity

As we pointed out in chapter three, we should study the stationary of the variables before estimating the model. A variable is stationarywhen the mean; variance and coefficients of its autocorrelation stay the same over time.Generally, if thetime origin of a variable changes but the mean and variance and autocorrelation coefficients do not change, the variable is stationary, otherwise the variable is non-stationary.
The hypotheses relating to the variables' stationary are as follows:

H_0 : The variable is stationary.
H_1 : The variable is stationary.

The variables' stationary can be investigated in three modes on the surface, on the first difference, and on the second difference.For the variables whose probability of their on the surface test is 5%, the null hypothesis is rejected and that variable is stationary on the surface and if it is over 5%, it will be non-stationary.

The results of the stationary tests are shown in table 3.Based on Lin & Chu test, because the probability value was less than 5%, all independent, dependent and control variableswere at stationary level during the course of research. Stationary means that the mean and variance of the research variables were fixed over time and the covariance of the variables was the same between different years.
As we have shown in the **[Table- 3]**,all variables are stationary and we do not need any cointegration test.

Table: 3.The stationarity test results of the research variables

Variables	Levin, Lin & Chu		ADF		Results
	Statistic	Probability	Statistic	Probability	
TAsset	33.75	0.000	476.05	0.000	Stationary
TAccrual	-32.27	0.000	461.45	0.000	Stationary
ΔSales	-35.14	0.000	435.16	0.000	Stationary
Ln PPE	30.21	0.000	405.86	0.000	Stationary
Flex_EM	-2165.2	0.000	970.92	0.000	Stationary
CPI	8.81	0.000	189.68\	0.000	Stationary

It is shown in the **[Table- 4]**,the F-Limer probability of the first model is less than 5%and therefore, we use the panel data method for their estimation. According to the Hausman test probability and since the probability of the first model test is less than 5%, we used the fixed effects model for their estimation.

Table: 4. Results of the F-Limer test and Hausman test

Model	Test	Statistic	Probability	Result
First	F-Limer	1.52	0.0006	Panel method
	Hausman	85.06	0.000	Fixed effects

Table: 5. Hypotheses test results

$$TAccrual_{it} = \alpha_{it} + \beta_1 TAccrual_{it-1} + \beta_2 RR_{it} + \beta_3 GDP_{it} + \beta_4 Flex\_EM_{it} + \beta_5 lpb_{it} + \beta_6 CPI_{it} + \nu_{it}$$

Variable	Estimated coefficient	t statistic	Probability
C	-7.1867	-0.4927	0.6224
TAccrual	-.01614	-0.2167	0.8285
RR	8.3060	7.0529	0.0000
CPI	0.0050	0.7090	0.4786
GDP	0.2577	0.2327	0.8161
Flex_EM	0.1915	1.0960	0.2740
lpb	0.4012	0.1999	0.8417
Coefficient of Determination	0.604		
Adjusted coefficient of determination	0.502		
Durbin–Watson	2.139		
F statistic	5.885		
Probability (F statistic)	0.000		

Recommendations resulting from the research findings

As we havementioned in this study, profit management is a kind of targeted intervention in the profit management that is attemptedby the manager of the business unit to raisethe reported profit to the desired level. With regard to the acceptance of the second hypothesis of this research and the

existence of significant relationship between its variables, we recommend to the institutions that try to show more profit to their investors to take more advantage ofdiscretionary accruals for the management of profit.Since the accruals are under the control of the manager, he/she can manipulate them by taking decisions by the virtue of such control and more importantly such changes occur within the framework of accepted accounting standards and principles and do not have a direct impact on cash flows.

CONCLUSION

Information enhances the knowledge of decision makers and reduces the level of their uncertainty. One of the most important factors of economic development of the countries is the existence of appropriate information systems. Accounting is an information system and it is a subject of attention in the economic enterprises as an effective tool in the process of preparation and presentation of financial information in order to make informed decisions by the users. In today's world, accounting information systems play a highly effective role in activities of the economic enterprises because the greater part of the information required across commercial and non-commercial departments for decision-making by the managers consists of accounting information.

The two articles by Barton &Simkostudied the effect of profit management flexibility.The net ratio of operational assets of the company (i.e.shareholders' equity minus available cashand negotiable securities, plus debt) to the sales is considered an indicator of profit management flexibility. Barton & Simko suggested that the companies with low flexibility in the management of profits will face analysts' forecastingproblems by increasing Rls. 1 per share.Kasznikfound that companies with low flexibility (that used the change in total accruals in the previous year indicator) faced problems with regard to the forecasts of the management of those same companies.The coreidea of both articles appertaining to the effect of the company's previous profit management on the current profit management flexibility seems interesting.This research adds the analysis of the decisive factors of profit management flexibility to the theoretical literature.This discussion studies various impacts of previous profit management measures on the company's ability to manage the profit and proposes a new structure that combines all of these factors. Experiments show that the new structure complements the flexibility discussed in the past research and includes the specific component – company; profit management flexibility. This study investigates the new criterion of flexibility (operational cycle flexibility criterion). This flexibility criterion is based on the difference between the applied flexibility and the flexibility limit. Gary Giroux [1] argues that the profit management covers a wide range starting from conservative accounting to non-based accounting and then continues with aggressive accounting and finally treacherous accounting.The important point is that there are numerous methods of profit management and the manager enjoys a great amount of freedom to manage the reported net profit in the framework of accounting standards. Also, for many accruals, disclosing the applied management of profit by the auditors will be difficult or if the auditors already know about it, sometimes they can't protest because most of the profit management techniques are within the scope of accounting standards. However, evaluation of profit management flexibility in a specific range is very important.

This research proposes and tests a new flexible profit management structure based on changes (fluctuations) within the range of the applied profit management and flexibility.The previous studies of profit management have focused on identifying managers' motivation to manipulate the profit [14]. Although these studies have shown that the profit management exists, in this case there is a missing link and that is the deliberate manipulation of the profit by the managers. Accounting covenants restrict the neutrality (objectivity) and provability of a set of allowed accruals. Also, the accepted general accounting principles restrict the managers' flexibility in the management of profit. Internal and external control mechanisms such as auditors, external operators, auditing committees and authorities that enact standards and regulations all contribute to restricting managers.Although managers can manipulate the accruals in the allowed set (e.g. committing fraud) but the costs of violation is high and its benefits are more important for most companies.In most situations, the managers may want to stay within the limits of accruals which they call "profit management flexibility limits". The specific limit of accruals is the profit management flexibility available to any manager at any specific time minus the limit of accruals that was adopted in the previous periods.

CONFLICT OF INTEREST
Authors declare no conflict of interest.

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COMOARISON OF PHYTOREMEDIATION POTENTIAL AND MAI INDEX IN PLAT *ANUS ORIENTALIS, ROBINIA PSEUDOACACIA* AND *FRAXINUS ROTUNDIFOLIA*

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ABSTRACT

Phytoremediation, or the use of green plants to extract, sequester, and detoxify pollutants, has shown considerable promise as a low-cost technique and has received much attention in recent years. Plants are capable of reducing environmental pollutions through uptaking contaminants in their tissues. This study was conducted to determine the uptaking ability of Cd and Pb by the leaves and shoots of Platanus orientalis, Robinia pseudoacacia and Fraxinus rotundifolia in Karaj city, the western Tehran, Iran. In the study site, twenty one-year-old leaves and shoots as well as twenty soil samples were sampled and analyzed by ICP. The results indicated that there was no significant difference in uptaking contents of Cd and Pb in the leaves among the trees. However, the mean concentration of the contaminants in shoots of Platanus orientalis was significantly higher than those of Fraxinus rotundifolia. No significant difference, however, was observed between the contaminants concentration in shoots of Robinia pseudoacacia and those in the others. The amount of Pb in the soil of the study area was significantly higher than Cd. Concentration of Cd and Pb in leaves of the species had the equal amount between all three species vary between 2.3 - 2.7 for Cd and 5.3 - 12.7 ppm for Pb. Fraxinus rotundifolia had the highest MAI value for leaves (2.22) and for shoots (2.75) further than the Platanus orientalis and Robinia pseudoacacia.

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INTRODUCTION

Phytoremediation, or the use of green plants to extract, sequester, and detoxify pollutants, has shown considerable promise as a low-cost technique and has received much attention in recent years. Additionally, this method can be accomplished in situ, it is environmentally friendly and the soil can be utilized immediately after treatment [1]. The term "heavy metal" refers to any metallic element with an atomic density greater than 6 g/cm3. These metals are ubiquitous, highly persistent and nonbiodegradable. [2].

Increasing industrialization and human activities intensify the emission of various pollutants into the environment and introduce various harmful substances into the atmosphere. Atmospheric pollution has harmful effects on humanity and plant growth [7]. Air pollution in urban areas could be caused by many sources and several methods have been developed to determine the sources and the level of this pollution. One of these techniques is using organisms as bioindicators and biomonitors [18]. Plants are able to reducing contaminants from the environment in different ways. They can achieve this through uptake, stabilization and translocation of materials [4, 6]. Excessive ability of some species in selective uptake of elements and contaminants, therefore, has provided a favorable use of plants in phytoremediation, use of plants to remove pollutants from the environment or to render them harmless [3, 15]. During the last decades, phytoremediation has grabbed researcher's attentions because of being cheaper than other common methods and also being in harmony with environment [8].

Environmental risk and damage occurs when the metals are available to living organisms [10]. Some heavy metals such as lead (Pb) and cadmium (Cd) which are not essential nutrients in organisms and exposure to low concentrations of them and cause high toxicity to plant and animal, can be removed from environment by plants. As well Pb and Cd can concentrate in aerial organs, annual and perennial shoots of some plants [5, 16].

Thus the researchs which probe the ability of the plants for remedy of the Pb and Cd will help us to introduce more suitable plants for phytoremediation in contaminated regions [2, 8]

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The main goal of this study was to determine the ability of *Platanusorientalis, Robiniapseudoacacia* and *Fraxinusrotundifolia* in uptaking of Cd and Pb from air and soil in one of the biggest park in Karaj city, Iran. The selected trees were extensively planted in Karaj and exposed to varying extents of Cd and Pb due to industrial and other activities.

MATERIALS AND METHODS

Study Site

The study site is located in Karaj (Jahan park, with an area about 110753 m2), 20 Km west of Tehran-Iran (Latitude 35° 51' N, Longitude 50° 50' E and 1300 m above sea level). The climate of the area is semi-arid with mild- cold winters and 7 months (Mid April-Mid November) dry season. Average annual rainfall and average annual temperature are 232 mm and 13.3° C, respectively. The highest rainfall is in March (41.32 mm) and the lowest in August (0.89 mm). The warmest month occurs in August and the coldest in January **[Figure- 1]**.
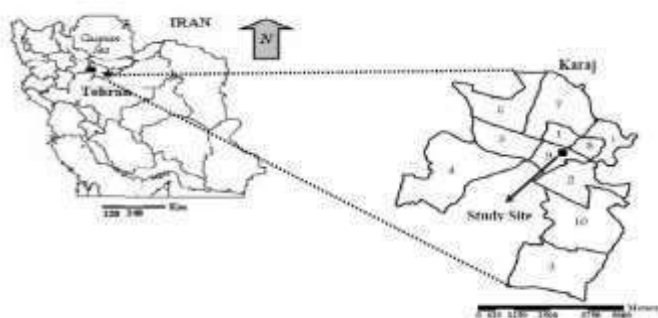

Fig:1. Location of investigation area (Jahan Park located in district 9 of Karaj city)

Field Sampling

Twenty trees of the nearly even-aged trees of Plain tree (*Platanusorientalis*), Black locust (*Robiniapseudoacacia*) and Persian Ash (*Fraxinusrotundifolia*) were selected. 20 even-aged trees of each mentioned species were relatively even-aged, were selected. The annual shoots and leaves from the lower part of crown were collected in four different directions at October, 2015. In total, 20 samples were taken from leaves and shoot of each species (60 leaves and 60 shoot samples). To determine the concentrations of Cd and Pb in the soil of mineral depth, 20 soil samples were taken in the depth of 0-30 cm from surface to rooting layer.

Laboratory Measurements

Soil properties of the study area are shown in Table 1. For determining the concentrations of Cd and Pb in leaves and shoots, leaves samples were washed with a shaving brush and double-distilled water to eliminate surface contaminants. Then samples were dried in oven 78 °C for 48 hours and pulverized with a chipper. Then 4-mL sulphuric acid and 16-mL Hydrogen peroxide were added to 0.5-g sample for digestion process. The extracts were exposed at 440°C in the Digesdahl. After 5 min the digestion process were completed and metal accumulation of extracts were measured by ICP (OES) set. The calibration process was done by the 1,000 mg·Kg-1 solution for Lead and Cadmium (MERCK), respectively.

Table: 1. Soil characteristics in the investigation region (Jahan park)

The investigation area			
Jahan park	Sandy-clay-loam	8.1	0.74

Data Analysis

Finally, means of lead and cadmium in each organ were statistically compared using SPSS software and Games-Howell test.
We used an accumulation index to assess the overall performance of the trees. Since this index is for metals, therefore it was termed as metal accumulation index (MAI) [9].

RESULTS

The concentrations (ppm) of Cd and Pb in the leaves and shoots of the *Platanusorientalis, Robiniapseudoacacia* and *Fraxinusrotundifolia* as well as in the soil of study area are shown in **[Table- 2]**. The total amount of Cd and Pb in the soil of this region are low and the pollution rate could not be announced as a problem [9, 13].

Concentrations of Cd and Pb in the leaves of *Platanusorientalis, Robiniapseudoacacia* and *Fraxinusrotundifolia* were shown in `**[Figure- 2 and 3]**. The results showed that there were no significant differences among leaves of the species in concentration of Cd and Pb. However accumulation of Cd and Pb in shoots of *Platanusorientalis* was significantly higher than concentrations of Cd and Pb in shoots of the other species. The significance different between species in shoots opposite of leaves introduce a transporting process from leaves to shoot in all of the species at the end of October.

Table: 2.The concentrations of Cd and Pb (ppm) in the leaves and shoots of the *Platanusorientalis, Robiniapseudoacacia* and *Fraxinusrotundifolia*

Species		The average of concentration (ppm)	
		Cd	Pb
Platanusorientalis	Leaf	2.7±0.2	12.7±1.9
	Shoot	2.4±0.1	11±2.1
Robiniapseudoacacia	Leaf	2.3±0.1	11.3±2.1
	Shoot	2.6±0.1	9.7±1.5
Fraxinusrotundifolia	Leaf	2.3±0.1	6.2±1.3
	Shoot	2.4±0.1	5.3±0.9
Soil	3.4±0.3	11.2±2.4	Soil
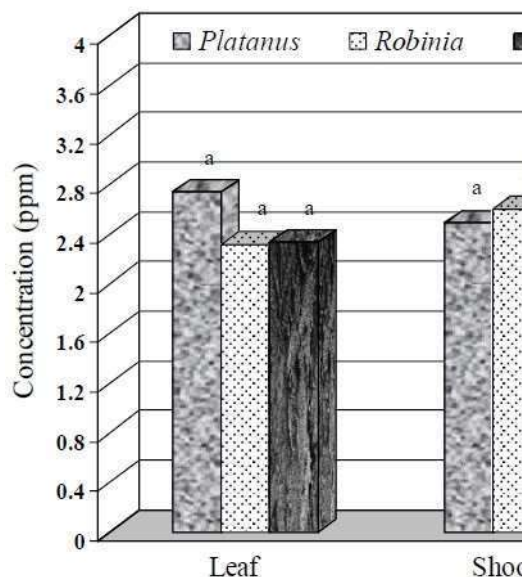
Fig: 2. Comparison of Cd uptake by the leaves and shoots of the studied spices (Error bars show the Standard Error of Mean (SE); means with similar letters do not differ from each other (p ≤ 0.05))
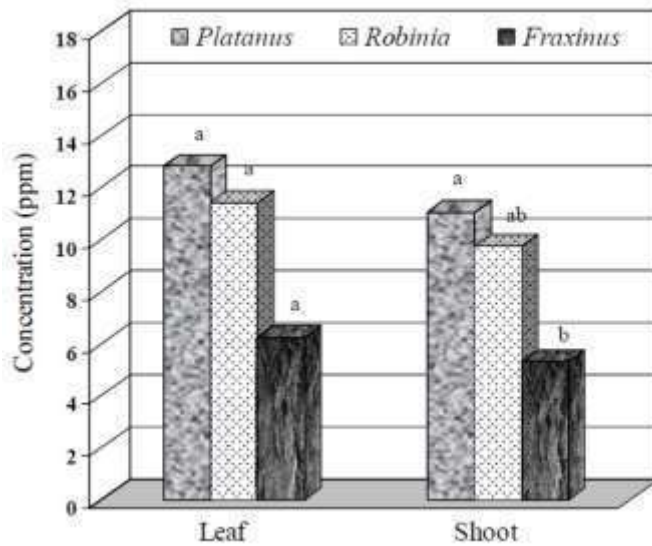..

Fig: 3. Comparison of Pb uptake by the leaves and shoots in the studied species (Error bars show the Standard Error of Mean (SE); means with similar letters do not differ from each other (p ≤ 0.05))

....

Also the results indicated that there was a significant difference between absorption of Cd and Pb in leaves and shoots of the tree species. The concentration of pb in leaves and shoots of the species was heifer than Cd `[Figure-. 4 and 5]. This could be due to the fact that the concentration of the Pb in the soil (11.2 ppm) was heifer than Cd (3.4 ppm) [Table- 2] [11].

As shown in [Figure- 6 and 7] there was no significant differences between leaves and shoots in all of the species in absorption of Cd and Pb.
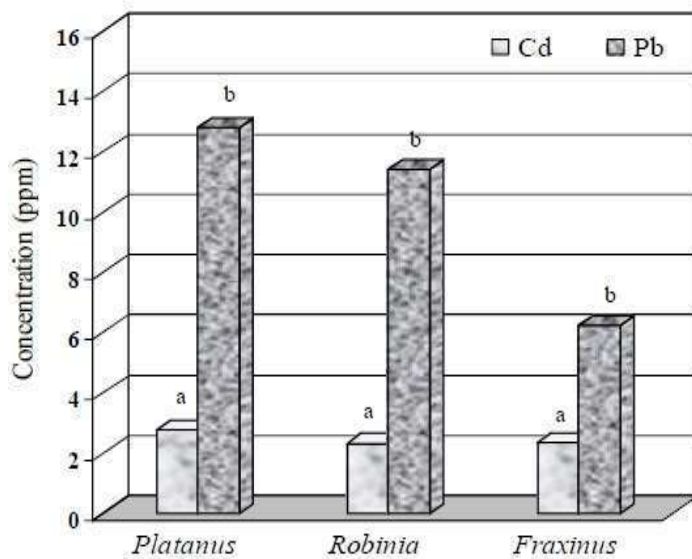

Fig:4. Comparison of Cd and Pb uptake by the leaves in the studied spices (Error bars show the Standard Error of Mean (SE); means with similar letters do not differ from each other (p ≤ 0.05)).
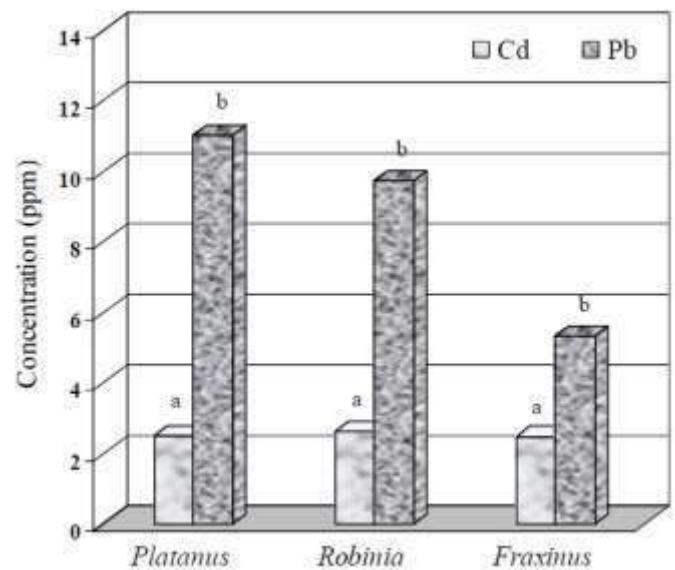

Fig: 5. Comparison of the amounts of Cd and Pb uptake by the shoots in the studied spices (Error bars show the Standard Error of Mean (SE); means with similar letters do not differ from each other (p ≤ 0.05))

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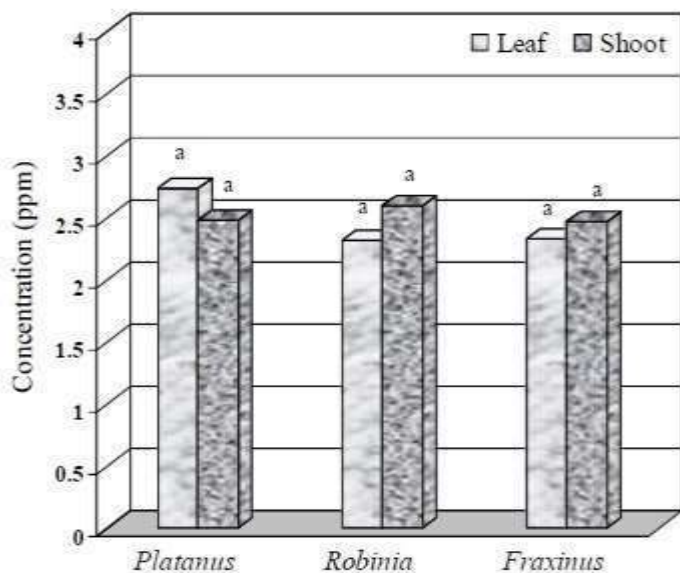
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Fig: 6. Comparison of the leaves and the shoots uptake of Cd in the studied spices (Error bars show the Standard Error of Mean (SE); means with similar letters do not differ from each other (p ≤ 0.05)).
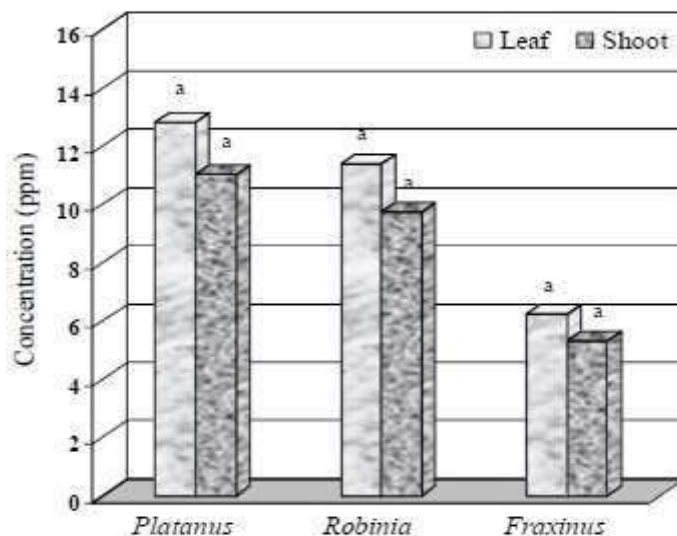
Fig: 7. Comparison of the stems and leaves uptake of Pb in the studied spices (Error bars show the Standard Error of Mean (SE); means with similar letters do not differ from each other (p ≤ 0.05)).

As explained before, we used metal accumulation index to assess the overall performance of the trees in terms of metal accumulation [9]. By applying this index to individual species, we found that *Fraxinusrotundifolia* had the highest MAI value for leaves (2.22) and for shoots (2.75) further than the *Platanusorientalis* and *Robiniapseudoacacia* **[Table- 3]**. It is clear that the total amount of contaminant in this region is apparently very low and the pollution rate could not be announced as a problem.

Table: 3. The values of metal accumulation index (MAI) for studied species

Species	Metal accumulation index	
	Leaf	Shoot
Platanusorientalis	2	2.68
Robiniapseudoacacia	1.95	2.53
Fraxinusrotundifolia	2.22	2.75

Concentration of Cd and Pb in leaves of the species had not any significance different between different species, whereas Aftabtalab (2008) demonstrated the higher amount of *Platanusorientalis* leave absorption in Cd and Pb versus *Cupressusarizonica*.

Shoots absorption of Cd and Pb in *Platanusorientalis* was significantly higher than *Fraxinusrotundifolia* and *Robiniapseudoacacia*. While the MAI index for *Fraxinusrotundifolia* was a little higher than the other species both for leaves and shoots.

CONCLUSION

In conclusion, it seems that the little amount of pollutants in soil of the study area is the most important reason for lower absorption of Cd and Pb in the leaves and shoots of the trees. In addition the significance difference between species in shoots versus leaves suggested a transporting process from leaves to stem in all of the species at the end of October. We found out that Platanusorientalis is the most suitable species for phytoremediation as Zeynep and Atmaca (2011) announced similar condition for *Platanusorientalis*.

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PHYTOREMEDIATION

ARTICLE   OPEN ACCESS

THE STUDY OF SATISFACTION RATE OF RETURNEE FROM URBAN SERVICES ADJUTANCY PERFORMANCE OF RASHT MUNICIPAL BASED ON SERVQUAL MODEL

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ABSTRACT

Customer satisfaction provides significant advantages for organization; in fact, higher levels of customer satisfaction cause to higher loyalty. The aim of this study is to investigate satisfaction rate of returnees from urban services adjutancy performance of Rasht municipal based on SERVQUAL model. All of returnees who use from the services of different parts of urban services adjutancy of Rasht municipal, form study statistical society. Findings show that the index of returnee satisfaction from urban services adjutancy performance based on 7 is 4/41. On the other hand, despite of returnees, some services that provide by urban services adjutancy performance of Rasht municipal, meet 63 percent of their expectations.

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INTRODUCTION

Knowing modern strategies, paying attention to important points in relationship with customer's establishment, maintenance and development, trying to atone in all steps, from research step and market measurement to some services after selling and measurement of satisfaction rate increase efficiency and effectiveness of an organization to gaini a customer-based ends and will gift a set from loyalty customers. Customer satisfaction will have a significant effect on present and future life of organization. Directing on customer satisfaction is not a new phenomenon. Most of successful practitioners in aeon have recognized the importance of focusing on customer satisfaction. Satisfaction is caused by customer judgment about this topic in an extent which the characteristic of this product or service is able to supply customer expectations in e desirable level [1]. Customer satisfaction provides significant advantages for organization; in fact, higher levels of customer satisfaction are cause to higher loyalty. Also, pleased customers probably talk about their experience for others. This topic has a significant importance, especially in eastern cultures that social life is formed such that social relationship is more with other people. Customer satisfaction is a key factor in forming of trend for immediate purchase of customers. Todays, organizations finding that customer satisfaction are a guarantee for organization survival. The importance of this topic is such that customer satisfaction is the most importance in quality length like European Firm Quality model (EFQM) [2].

Urban services adjutancy performance of Rasht municipal which is include seven organization (residuum organization, beautification, fire-fighting, bus, terminal, calm and taxi organization) is one of the most important of Rasht municipal adjutancy that its services has a direct relationship with civil routine life. Development of burgess, increasing the expectations and society disposability needs and respond to civil orders has promoted undertakers to provide requires modern services of society. Naturally, represent the modern services and along with society needs and in a proper time and place, proper quality and quantity in desirable space, environment beauty, human relationship and good moral and so on gain some indexes that make evaluable the performance of services by urban services adjutancy of Rasht municipal. In the same regard, urban services adjutancy of Rasht municipal with a long history and also as one of the organizations that supply different parts civil required services, should enterprise along with other similar services organization and in some cases farther than it, using scientific models than its performance evaluation and enterprise to improve its performance with knowing and understanding internal strength and weak parts and external opportunity factors. This topic is showing the importance and efficiency present study.

For this reason that municipalities need to seek supply the best quality in providing services to citizens. The results of several studies show the quality of services is a prelude to customer satisfaction and there is a strong positive relationship between service quality and customer satisfaction [3]. Quality services can be used as a measure of the size of the service provided to the customer expectations are defined [4]. Quality services play an important role to achieve important results such as trust, customer satisfaction and loyalty plays [5]. Efforts that company does to improve service quality through increased quality services, it is essential for keeping customers satisfied [6]. Today, the quality of products and services received by our customers is very important, and this has become a task for companies in the supply of quality products and services in the market. Therefore, it is obligatory carefully following the necessary steps to meet its customers' expectations and the urgency of doing something [7]. There are many temples to measure the rate of quality services that SERVQUAL is one of the most specific tools between them to measure expectation and understanding of customers and is an evaluation method to introduce strength and weak points of quality services of organization, this tool is used for measurement and comparison of understanding and expectation of customers outside of the organization. Now, according to titled topics, we can say that requirement and feedbacks received from Rasht municipality (Deputy municipal services) is one of the most important resources for design and development of new services, promote and improve the systems and operation process. So, this study is sought to find a response for following topic:

Services provided by the City of Rasht (Department of Civil Service) offered to provide what clients satisfaction?

MATERIALS AND METHODS

Hypotheses

The research hypotheses have been developed based on SERVQUAL gap model:

H1: There is a difference between client expectations of service quality and their perception of service quality which are provided by the mayor of Rasht (Department of Municipal Utilities).

H2: There is a difference among the various department managers inferred northern city of Rasht (Rasht deputy municipal utilities) the expectations of the clients and their real expectations.

H3: Deputy municipal utilities Rasht performance standards (standards and indicators compiled available to measure Quality of Service) doesn't have capabilities Rasht Evaluation concluded by managers and municipal officials (including the mayor and senior managers of the municipality).

H4: Municipal Utilities Department staff Rasht do not have the ability to fully realize the performance standards. (Continuous performance standards are not observed.)

H5: There are differences among the services that they are committed to doing Rasht deputy municipal utilities and services that are practical.

Sample size and data collection

All references to deputy municipal utilities from different parts of Rasht services they use constitute the study population. Therefore, by visiting different parts of urban Rasht refer clients to receive services there, were studied to distribute questionnaires and data extraction. In some cases questionnaires directly to the addresses of people who had used the service as well as through social networks, was sent and was developed to collect preliminary data. Given that the subject of study and measure the satisfaction level of users of services provided by the Department of Municipal Utilities Rasht, As well as various parts of urban sprawl city of Rasht, was used from stratified sampling method. A total of 439 questionnaires were delivered 28 due to incomplete version was not used, and the number of completed questionnaires that were used in 411 copies.

Reliability and Validity

All questions are plan based on theoretical hypotheses and according. After designing items, the questionnaire were for professionals, managers and experts Deputy Municipal Utilities Rasht (managers and individuals with a history of different parts of Rasht deputy municipal utilities) and professors and their opinion about the validity of the questionnaire was applied, and the questionnaire was positive in terms of their validity. So we can conclude that it is a content validity of the questionnaire. Cronbach's alpha coefficient used to assess the validity and value of this index was calculated for all variables that optimal value is higher than 0.7.

RESULTS

Of the 439 people participated sample group to meet 269 men (61 percent) and 170 women (39%) were formed. Of the 439 people participated sample group to meet; 89 (28/20%) between 20-30 years, 112 patients (51/25%) between 31 and 40 years, 152 patients (62/34 percent) between 41- 50 years and 86 patients (59/19 percent) over 50 years of age, with an average age of respondents was 39 years.

In SERVQUAL, slots 1 and 2, (hypotheses 2 and 3 R) are management gaps that are managers, key employees associated with these gaps. Slot 1 compared to the expectations of clients comes from lack of understanding of managers and Slot 2 represents the failure of managers is in determining the service appropriate specification.

But slots 3 and 4 (hypotheses 4 and 5 research) related to front-line employees serve more, because these employees, people who are likely to provide services in the service profile (slot 3) or promises offered notification to clients shortened through foreign notices (slot 4). So the most appropriate respondents to the survey regarding the measurement gap of 1 and 2 (hypotheses 2 and 3 R) Directors and to slots 3 and 4 (hypotheses 4 and 5 research) are front-line employees.

The normal test data obtained from testing the K-S, was used, which its results is coming in **[Table-1]**. As highlighted in **[Table-1]** can be seen, the significance level calculated is for each of the five dimensions of SERVQUAL of α < Sig. Thus, assuming of H∘ normal distribution was rejected in five dimensions and is not mentioned as a normal distribution. In other words, decision criteria (P-Value) whose value is less than 05/0, indicate rejection of the null hypothesis. It means that "sample has not been achieved from the normal distribution."

Table: 1. data normalization using K-S test

Dimensions name	K-S	Sig (P-Value)	Probability of error level (α)	Test results
Appearance and facilities	4.758	0.00	0.05	Distribution is not normal
Reliability	4.681	0.00	0.05	Distribution is not normal
Propensity for responding	3.997	0.00	0.05	Distribution is not normal
Guarantee	3.747	0.00	0.05	Distribution is not normal
Communion	3.706	0.00	0.05	Distribution is not normal
Total	4.880	0.00	0.05	Distribution is not normal

H1: There is a difference between client expectations of service quality and their perception of service quality which is provided by the mayor of Rasht (Department of Municipal Utilities).

In fact, the most important measures are SERVQUAL questionnaire gap, ie the gap between expectations and understanding of users Deputy Municipal Utilities Rasht (first hypothesis). 4 other slot (hypothesis 2 to 4 of this study), if any, is affected on the gap. Therefore, we can know the results from the measurement of the satisfaction of users of municipal services Municipal Services Department of Rasht in the previous section were calculated determinant the gap. In fact, according to data extracted from the sample, it can be concluded that the function of deputy municipal services based on client satisfaction index 7, the number is 41/4. In other words, according to the clients, the services provided by the Department of Municipal Utilities Rasht, 63 percent meet their expectations.

H2: There is a difference among the various department managers inferred northern city of Rasht (Rasht deputy municipal utilities) the expectations of the clients and their real expectations.

As previously noted, this gap is the gap management. To test this hypothesis (gap a Servqual) questionnaire distributed among company managers, company executives expect customers to express their views. A total of 100 questionnaires were distributed to managers of various departments Department of Municipal Utilities Rasht, of which were received 83 questionnaires; The number 4 of the questionnaire was incomplete and end up with a total of 79 questionnaires were tested this hypothesis. According to data extracted can be concluded that Client satisfaction index based on seven deputy managers, the questionnaire is completed by the managers 48/4 number.

In other words, the deputy directors believe that references to the 02/64 percent, services in various sectors Rasht deputy municipal utilities against their expectations.

H3: Deputy municipal utilities Rasht performance standards (standards and indicators compiled available to measure Quality of Service) doesn't have capabilities Rasht Evaluation concluded by managers and municipal officials (including the mayor and senior managers of the municipality).

To investigate this hypothesis, deputy managers were asked which aspects of the research questionnaire, points 1 to 7 is allocate based on official standards (written, clear and communicated to employees) or informal (verbal, non-committal and incomprehensible for staff) the examination and or if no target is not defined in the standard, announce their opinion. A form was designed for this purpose that the number of deputy directors filled 29 of them.

They were calculated after collecting the forms, as many points as deputy managers, functional standards, given the importance and privilege to each dimension of the questionnaire. This score is a number from 7 4/4 to 90/62% of existing standards of other words they knew their perceived expectations.

H4: Municipal Utilities Department staff Rasht do not have the ability to fully realize the performance standards. (Continuous performance standards are not observed.)

As mentioned earlier, the gap is more related to front-line employees. To test this hypothesis (slot 3 Servqual) of front line staff have been asked to points 1 to 7 based on the ability of employees in achieving performance standards available, to allocate each dimension; as the number given to the best indication of the ability of employees to achieve performance standards developed in each of the dimensions. If employees are able to fulfill existing standards, do not tell your comment in the space provided. For this purpose, a form was prepared and 100 forms were distributed between front-line employees, 96 of these forms were delivered. Of this number 12 was incomplete, which 84 form was used eventually to review this slot (hypothesis).

It was calculated the total rate (based on importance and the rate that employee give to each dimension of questionnaire to receive performance standards) after collecting front employee's opinion. This rate is 4/16 based on 7. On the other hand, company's employee has capability 59/44 percent of performance standards.

H5: There are differences among the services that they are committed to doing Rasht deputy municipal utilities and services that are practical.

As we said previously, this gap is more related to front employees. To test this hypothesis (slap 4 SERVQUAL model), it was asked from front employee to despite of their rate 1 to 7 allocate each one of the questionnaire dimensions based on some services that different parts of Rasht deputy municipal is responsible to doing it; as above number is best showing employees' understanding in each one of the dimensions. If employees are able to state their understanding from providing services' level are not in each of questionnaire dimensions, they are saying their opinion in related part. For this purpose, we provide a form that is distribute in 100 numbers between front employees that 96 from these forms are delivered. Of the 12 numbers were incomplete that at last 84 numbers of forms is used to investigate this slot (hypothesis test).

The total rate is calculate after collecting front employees' opinion, that is given based on their believe for Rasht deputy municipal, in providing services' level that are invite to references. This rate is 4/20 based on 7. On the other hand, they know employee as a successful person in the rate of 59/98 percent of Rasht deputy municipal in acting to their commitments.

CONCLUSION

According to this topic that the step of dependency and necessity exploit in this study has done and at last, after collecting and their categorization, it was provided final questionnaire and it was investigate its Reliability and Validity, it is not necessary to do these steps. But also, executive team is comprise human resources exports, financial, design and program and … programming such that at least twice a year control the needs and place new requirements in questionnaire. Of course, the change of questionnaire tools (questionnaire) in appropriate time gap

is due to don't enter a disorder in reliability of system and data analysis and the results were comparable with previous period. First, it is necessary for doing this project that all parts of Rasht deputy municipal introduce the members of executive team who are the main factor of confirmation of this project in Rasht deputy municipal and has been provided necessary trainings to them. Much as it should be programming such that questionnaires distribute twice a year in different time gap and their data exploit by executive teams and was calculate the index of references satisfaction after data analysis. At last, different department of all of done proceeding and send the results of information analysis to executive undertakers in Rasht deputy municipal to calculate the total satisfaction index by collecting information and their analysis by executive team in Rasht deputy municipal.

Sent information from different departments of key point and improvable is character in final analysis and some points that have the ability of fast improvement, has returned to order trustee to has done the necessity to improve them and necessary programming is done to improve some points that are need to expertise and more time to was touchable the results of pervious works in the further reliability.

The most important of purposes and advantages of using from offered method

A – First, the aim of execution of this study is recognize the present status of references satisfaction from the performance of different parts of Rasht deputy municipal.

B – Form the information banking from references needs and update this bank by executive team.

C – Acknowledgement from references' satisfaction rate from Rasht deputy municipal and use from references' opinions to improve operational process and design and development the new services.

D – Use from references' opinion and criticism in strategic programming process.

E – Recognize the executive method to increase the references' satisfaction from services of different parts of Rasht deputy municipal.

F – Recognize the internal strength and weakness points and external opportunity points and try to their managements.

G – Being low – cost of this method and encourage a group-work of the advantages of this system in municipality.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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None

FINANCIAL DISCLOSURE
None

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ARTICLE **OPEN ACCESS**

THE EFFECT OF STRATEGIC THINKING AND SOCIAL RESPONSIBILITY ON ORGANIZATIONAL PERFORMANCE (CASE STUDY: YAZD GOVERNOR EMPLOYEES)

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ABSTRACT

The present study is applied in terms of purpose, descriptive survey in terms of data collection method and quantitative in terms of the data obtained by questionnaire. To measure the strategic thinking the questionnaire designed by Moon(2013) was used[1],in order to measure corporate social responsibility the standard questionnaire by perz (2015) was used[2], to assess the organizational performance questionnaire of Hersy and Goldsmith was applied. In this study, the corporate social responsibility and strategic thinking are dependent variables, organizational performance is mediating variable. The research population is the Yazd Governor Employees that according to Cochran formula 286 subjects were selected as samples. Data analysis was performed by SPSS and AMOS. These findings have important role in social responsibility and strategic thinking on organizational performance confirmed. In fact, the findings show that strategic thinking is stronger effect on enhancing organizational performance. The findings of this study can be managers in identifying the strengths and weaknesses of organizational performance based on the strategic thinking and social responsibility.

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INTRODUCTION

Strategies, programs and organizational thinking are among the success factors of the organizations and as these factors are more institutionalized and understood among the staff, the organizations become closer to the financial and non-financial goals [1]. "Strategic thinking" is proposed against the shortages and bottlenecks in the strategic planning for the business environment. Strategic thinking is an approach based on strategic principles and proposes the divergent and creative thinking for a value making strategy. Strategic thinking beyond the methodological and procedural aspects looks as strategy as an art [3].

On the other hand in 2015 during studies conducted in America. The results showed that 49% of respondents have changed their buying because of environmental issues. Study on 16 thousand Australian Bureau of Statistics also show that 75% of people are concerned about environmental issues

The above statistics indicate that environmental issues and protection of the environment is one of the main criteria that customers consider when they receive them As a result, this has caused environmental issues into management concepts and approach to social responsibility is more than ever [4]. Statistics show that customer sensitivity to social responsibility organization.
This essay will focus on two features of social responsibility and strategic thinking on organizational performance

THEORETICAL BACKGROUND

Strategic thinking

Strategic thinking includes finding and developing a strategic foresight capacity for an organization, by exploring all possible organizational futures, and challenging conventional thinking to foster decision making today. Recent strategic thought points ever more clearly towards the conclusion that the critical strategic

question is not the conventional "What?", but "Why?" or "How?". The work of Henry Mintzberg and other authors, further support the conclusion; and also draw a clear distinction between strategic thinking and strategic planning, another important strategic management thought process [5].

General Andre Beaufre wrote in 1963 that strategic thinking "is a mental process, at once abstract and rational, which must be capable of synthesizing both psychological and material data. The strategist must have a great capacity for both analysis and synthesis; analysis is necessary to assemble the data on which he makes his diagnosis, synthesis in order to produce from these data the diagnosis itself--and the diagnosis in fact amounts to a choice between alternative courses of action." There is no generally accepted definition for strategic thinking, no common agreement as to its role or importance, and no standardized list of key competencies of strategic thinkers. There is also no consensus on whether strategic thinking is an uncommon ideal or a common and observable property of strategy. Most agree that traditional models of strategy making, which are primarily based on strategic planning, are not working [6].

Liedtka observed five "major attributes of strategic thinking in practice" that resemble competencies:
Systems perspective, refers to being able to understand implications of strategic actions. "A strategic thinker has a mental model of the complete end-to-end system of value creation, his or her role within it, and an understanding of the competencies it contains."
Thinking in time means being able to hold past, present and future in mind at the same time to create better decision making and speed implementation. "Strategy is not driven by future intent alone. It is the gap between today's reality and intent for the future that is critical." Scenario planning is a practical application for incorporating "thinking in time" into strategy making.

Intelligent opportunism, which means being responsive to good opportunities. "The dilemma involved in using a well-articulated strategy to channel organisational efforts effectively and efficiently must always be balanced against the risks of losing sight of alternative strategies better suited to a changing environment [7].

Corporate social responsibility (CSR)

Corporate social responsibility (CSR) practices are becoming increasingly common across countries and industries [8].Maintenance of corporate social responsibility is becoming increasingly dependent on compliance. According to research by 2002, over 70% pwc Institute Director corporate world believe that respect for social responsibility has an important role in the profitability of their companies. The success of social responsibility depends on the attitude of the new generation.

Europe Commission defines corporate social responsibility as a concept whereby companies' social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis are observed. This concept is about organizations who decide to cross the minimum legal requirements and risks of the collective agreement to consider social needs. Font (2012) defined CSR as the sum of the obligations that abusiness is expected to fulfill, and developed a four-dimensional CSRmodel based on the idea that "the social responsibility of businessencompasses the economic, legal, ethical and philanthropic expectationsthat society has of organizations at a given point in time [9].

Carroll (1991) also observed that, to fulfill economic responsibilities,a firm needs to maximize earnings per share, be as profitableas possible and maintain a strong competitive position and a highlevel of operating efficiency. Legal responsibilities are fulfilled byobeying the law, complying with various federal, state and local regulationsand being a law-abiding corporate citizen. Ethicalresponsibilities refer to expectations that a company will abide by societal mores and ethical norms, including recognizing and respectingnew or evolving ethical/moral norms adopted by society,and will not pursue corporate goals at the expense of ethical norms.To fulfill its philanthropic responsibilities a firm must meet the philanthropic and charitable expectations of society by sponsoring thefine and performing arts, encouraging managers and employees toparticipate in voluntary and charitable activities in their local communities,providing assistance to private and public educationalinstitutions and supporting projects that enhance a community'squality of life [10].

Organizational performance

Paul Hersey and Marshall Goldsmith developed the achieve method for leaders to use as a performance management tool to help determine specific performance problems and understand why these problems exist. According to Hersey and Goldsmith, the use of a situational approach is an effective way to address performance management.

The achieve uses seven variables: ability; clarity; help; incentive; evaluation; validity; and environment, to provide leaders and followers with the necessary tools to improve performance. By using these seven aides, management can identify performance problems and determine why these problems exist.

The letter "A" represents ability and constitutes the skills, experience, etc., possessed by an employee. Managers identify skills possessed by employees and set goals and tasks based on ability information.

"C" represents clarity and is the ability of an employee to clearly understand requested tasks and possess knowledge of what must be done in order to accomplish them. Problems with clarity in a situation may result in goals that are never accomplished. It is extremely important that managers clearly state goals and objectives up front to employees.

The "H" in the third variable, help, refers to support by the organization necessary for employees to complete goals and objectives. Support encompasses anything from monetary resources to equipment resources. It is the responsibility of management to aide the employee in obtaining necessary resources.

"I" stands for incentive. This refers to the motivation of the employee to achieve a task or goal. Managers must remember that employees are motivated in very different ways and address motivational needs based on the individual situation.

"E" refers to evaluation and relates to the incentive variable discussed previously. Employees must receive periodic on-going feedback regarding their performance. Without feedback, employees "wonder" what is going on and can become unmotivated. Management should document positive as well as negative feedback.

"V" stands for validity. The validity of a situation includes the legalities of decisions by managers. Managers must consider laws and company policies when making human resources decisions. Managers should document any issues based on performance. It is the responsibility of management and human resources to ensure their decisions are valid.

The final letter "E" stands for the environment variable. Environment refers to all external factors that may affect performance. Some of these include suppliers, market changes, etc., Employees can only perform as their environments allow[11].

Research hypothesis
H1: Strategic thinking positively influences organizational performance
H2: Corporate responsibility positively influences organizational performance

METHOD

The survey of this study was conducted on employees of a Governor of Yazd. Data related to the ethical climate, corporate reputation and organizational identification were obtained directly from the employees of the firm through the questionnaires, which means primary source data were used in the research. The firm has 228 employees throughout the country. All these employees were contacted via email with the help of the human resources department asked to participate in the survey. A total of 214 questionnaires were returned, so the return rate of the research was %94. However, 48 of them were not usable, so 166 questionnaires were used in analysis (n=166). Data obtained from questionnaires was analyzed through the Amos statistical packet software (v.18) and proposed relations were tested.

In this research data are collected by field method. In field method, questionnaire is one of the most usual methods for collecting data. For collecting data and receiving to goals, this research used nameless questionnaire including 45 questions that filled by consumers. At the beginning of questionnaire there were questions for recognition of personal features of statistical community. Questionnaire questions are regulated based on sequential scale and Likert's five degree scale including 5 scales very low, low, average, much and very much and designed as classified and based on trice hypothesis topics. Since in this research we used standard questionnaires The corporate social responsibility developed by Perz (2015) [2], The strategic thinking Questionnaire [1] with three items for each theoretical dimension of strategic thinking, and The Organizational performance Scale developed by Paul Hersey and Marshall Goldsmith (1998) with were used.

In this research for evaluation of reliability coefficient of questionnaire, we used internal adaptive method and by using Cronbach's alpha coefficient. By primary distribution of 30 questionnaires, reliability coefficient for questionnaire was **0.897** which shows very good reliability.

FINDINGS OF THE ANALYSIS OF RESEARCH CONCEPTUAL MODEL

Confirming measurement models of research variables, the conceptual model of research investigated by structural equation modeling. The reason for using this method is that this model has the capability instead of examine two to two and separate variables, the relations among all variables survey concurrently. SME approach is a comprehensive method for testing the hypothesis about the relations among observed variables. Since the conceptual model of research considers the survey of causative relations, for providing concurrent analysis.

possibility of variables relations, we used structural equation method which it is used in model analysis of AMOS software that is one of the most famous software's for performing structural equations.

The results of SEM analysis, the overall model were CMIN

X^2=68.121, DF= 50 p=0.0 the fit indices were all in acceptable ranges with

CFI= 0.980, TLI=0.974 and RMSEA=0.047. Models with cut-off values above 0.90 for CFI, and below 0.08 for RMSEA are considered to have a good fit between the hypothesized model and the observed data.

Structural model results

[Figure- 1] displayed all of the structural relationships among the studied constructs; path coefficients and their significance, for each dependent construct are also presented in this figure. As indicated in [Figure- 1]all hypotheses, were supported by the data. The hypothesized relationships (H1 to H2) were found to be significant in the proposed directions.
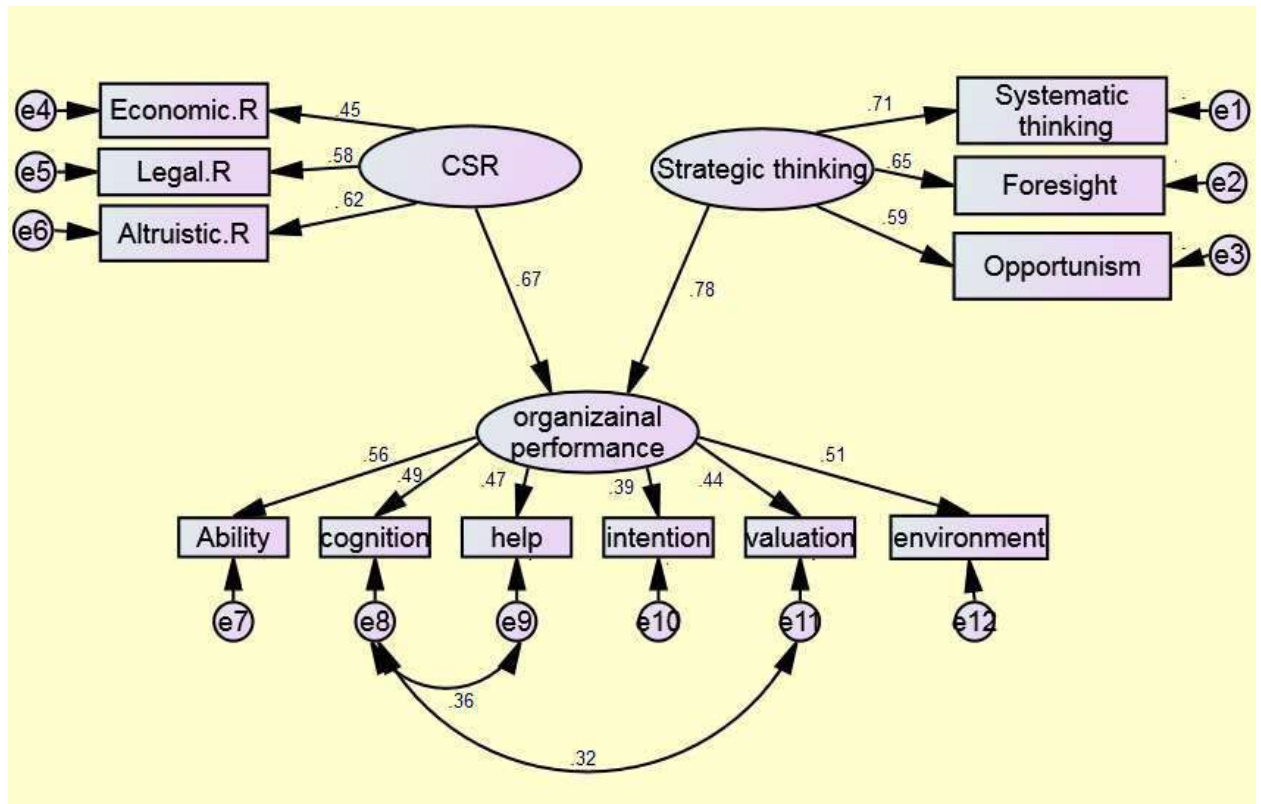

Fig:1. Structural relationships among the studied constructs

DISCUSSION AND CONCLUSION

Dynamic capabilities are a relatively new topic in strategic research and hence it requires a lot of analysis especially in the case of empirical studies. This paper is a response to the need for research in this field of knowledge and the results of this study can help companies to improve their current management style to create superior customer value. In general based on the obtained results the organizational commitment to social responsibility predicts many management variables in organizations including the organizational performance.

Based on previous studies of social responsibility it can be predicted that the employees react to the presence or absence of a commitment to responsibility. One of these reactions is the decreasing throughput of organizational performance.

This means that if employees see that there is no social responsibility in the organization, they develop a type of negative tension and thus in order to reduce this tension they attempt to reduce their inputs and contributions in developing the organizational performance. Conversely, if the employees feel that the organization is committed to social responsibility they are motivated to increase their contributions to improve performance by input helping behaviors.

The results of this study are consistent with Fairholm, [12]and Iqbal et al [10].
Strategic thinking defines 78 percent of relationship variance and this indicates that the development of strategic thinking in governorship promotes the performance indicators. In fact, strategic thinking with components such as systematic thinking, prospective, clever opportunism and providing solutions for strategic problems provides the area to save the organizations in crises and also provides the performance and service delivery enhancements.
Strategic thinking is an important skill for managers in the competitive and transformational environment. The experts believe that the speed of changing the environment is so high that it is not possible to solely rely on strategic planning and instead the people in an organization should enjoy thinking skills to present the proper reaction to the environmental changes. These skills are not only useful for the business environment but also for their personal lives. His basic question is: "Which strategy is more appropriate to achieve the goal?" The strategic thinker instead of accelerating and understanding the current processes is looking for new methods and different solutions. Such solutions make the impossibilities of common intellectual system possible in new intellectual system and this leads to the organizational effectiveness [13].

CONFLICT OF INTEREST
Authors declare no conflict of interest.

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EARTHQUAKE RISK ANALYSIS AND REVIEW OF THE GEOLOGY OF THE DAM SITE AREA OF DASHT PALANG

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ABSTRACT

Iran is considered one of the most earthquake-prone countries in the world, so that, each year, many small and medium earthquakes, and every ten years, a large earthquake happens in it. Because of tectonic earthquakes, and geographical and climatic situation, Iran, has the potential of creating several strong earthquakes. Therefore, seismic studies, geological and seismic tectonic seismic areas of the country are essential. In this paper, geological studies and seismic assessment can be eliminated from the fault and the intensity of the earthquake from their area of Dasht Palang dam site is investigated using empirical relationships.
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INTRODUCTION

The tectonic earthquake in Iran shows that the position of the seismic, geological and tectonic quite consistent with its status. Tectonic point of view, Iran is located on seismic Alpide belt. This belt starts from the Portuguese and extending through southern Europe and Iran in the East and South-East Asia and the Pacific and more than 95 percent of the world's earthquakes formed in the linear region. Iran is an area with high seismic potential, due to the pressure that comes to Iran, the plane of the kingdom and the great earthquake, and the amount of human and financial damages from them.

Area of Dasht Palang dam is located in Bushehr Province, located in the various faults that cause earthquakes and heavy with their movements. Therefore, the surrounding area of Dasht Palang Dam Site is a high-risk earthquake-prone area of the country. The dam site is located in the vicinity of major faults such as Borazjan fault, Pishani Koohestan fault, Pish jarfay Zagros fault and fault Kenarbandak, the movement of each, will create a destructive earthquake. More than 105 earthquakes, with a magnitude of 4.5 on the Richter scale, and 50 earthquakes, with a magnitude of 4.9 on the Richter scale, happened in the area of Dasht Palang Dam. Geological evidence and earthquake events and studies show seismic activity of the region. Therefore, the calculated risk of earthquakes in the site is inevitable; in order to reduce injuries and damages caused by earthquakes to a minimum consider the economic issues.

MATERIALS AND METHODS

General geology of the project area

In [**Figure- 1**]Study area, the construction division of Iran, is part of the Zagros Folded Zagros (external), southwest of Iran, and sediment, chemical and clastic sediments are often among relatively young Cenozoic Miojiosinklain Zagros, with a thickness of approximately 12,000 meters which was composed mainly of limestone, marl and shale.

An overview of the geological features of the area is:
- The general trend in the region is northwest-southeast.
- Most of the alluvial plains, formed in the central part of the syncline (Dasht Palang syncline), and faults the process chains, too, have had a decisive effect on the formation of some of them.

GEOLOGY

- More than 10 kilometers of sedimentary deposits, Kambrin- Pliocene age were formed in the Zagros sedimentary basin, they have created, a row of precipitation, with a lack of stratigraphy, and the most important tectonic event type orogeny at the end of the Tertiary and Quaternry beginning, made them rigid, folded and fault.
- Faults have been very few away from the High Zagros and their function is limited. Most concurrent with the Zagros fault are compressive but faults in the other direction is almost parallel slide.
- Hormoz series is the oldest formations in the area, which is composed mainly of gypsum and salt, they were viewed as salt domes, the Amir anticline, Khormoj, Koohnamak and Koohsormeh.
- Most of the stones of this row is made of carbonates (mostly limestone), but in the Tertiary period, especially during the Neogene clastic continental sediments, limited due to interference of the marine environment, led to the formation of the Gulf, where it started In most places, with evaporite deposits.
- Formation of Fars (Gachsaran, Mishan and Aghajari), tab are linked to each other, and sometimes replaced with each other completely, and because the thickness is very variable.
- As a result, in the late Neogene orogenic conglomerate Bakhtiari Formation unconformity is located on the older formations.
 In [Figure- 1], the geological structure of schematic classification is presented.
structure of schematic classification is presented.
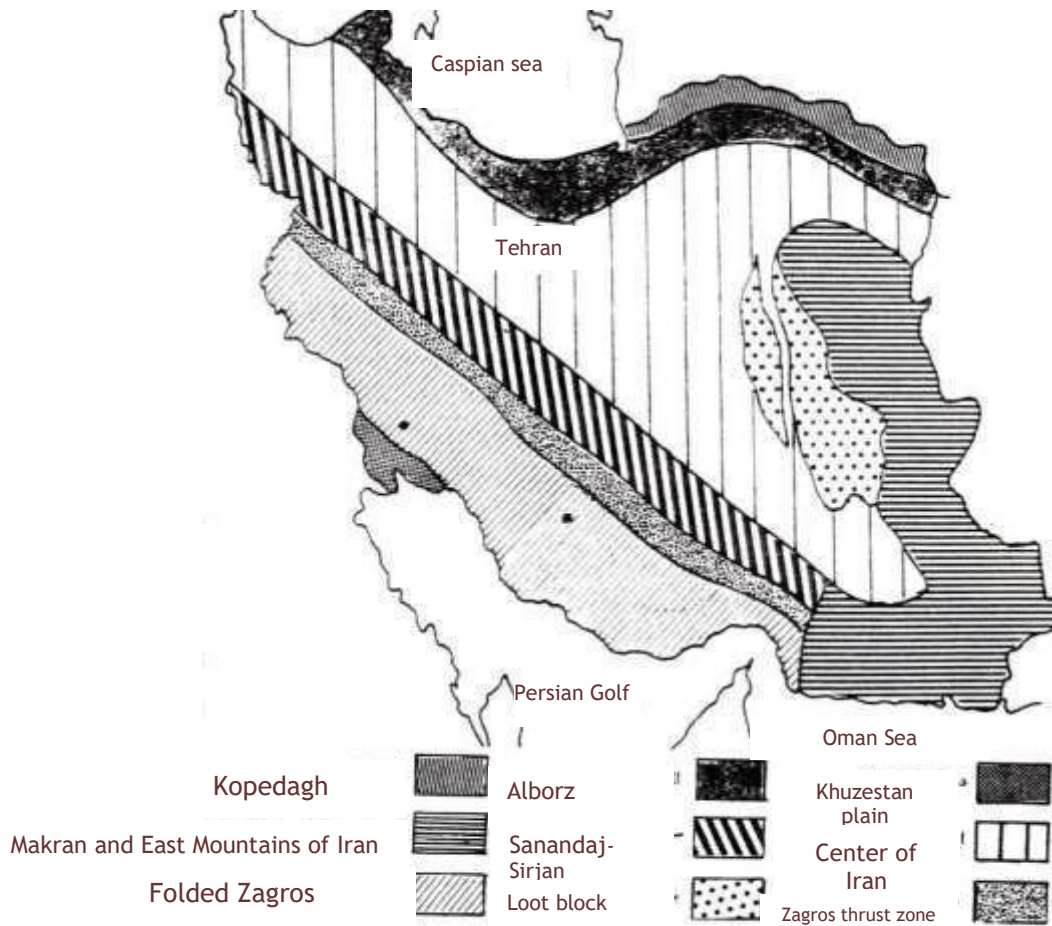
Fig: 1.The geological structure of schematic classification is presented
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Schematic drawings of the division of Iran geological structure, from Ashtoklin and Ruthner, Obteind from Alavi Naeini, 1972

Stratigraphy

The project geology is based on stratigraphic data [1]. Stratigraphy can look directly in many cases, layers, on the surface, but, on the rocks are not on the surface, but about core, small stones, leaving the drill exploratory wells, and the wells forms march are used. The next step is the introduction of stratigraphic units, or groups of such formations. With the introduction of these units, we can not classify the layers of the Earth's surface, in terms of features. The stratigraphy, the scope of the project includes Hormoz

series, Khami Group, Bangestan Group, Pabdeh-Gorpi make, Asmari formation, Gachsaran make, Goori sector, Mishan formation, Aghajari formation (sandstone and conglomerate) and deposits and deposits the present period.

RESULTS

In geological formations in the area

Tuesday salt dome, are seen in the area close to it and is that it contains salt domes, in Gachoo anticline, Koohenamak and Khormoj. Khormoj salt dome, including Maran, black shales and igneous rocks gypsum, dolomite, limestone and marl black and anhydrite, dome can be seen in the cast of the masses, the great fault Qatar-Kazeroon is the main cause of the rise of the salt domes at ground level, in the areas. Salt dome in salt anticline in 30 km South-West of Dasht Palang Dam is shown in [**Figure- 2**]**.**

Fig: 2. Dome in Namak salt anticline, 30 km from the South West of Dasht Palang Dam
....

Aghajari formation is the most important and most extensive stratigraphic rock units, ranging from Dasht Palang Dam which is especially important. Its constituent rocks, generally include marl and sandstone, which is red in general, but also in its light gray color. The status of the dam, spillway, reservoir and river water diversion tunnel are made in full and more than 8% for the valley - the river is formed in the unit (they had Aghajari Aj signs on the map diagram) . Specifications and availability are within the proposed project area, listed, in [**Table- 1**] and [**Figure-3**] shows.

Table 1: Area of the formations in the study area

Symbol	Name geological formations	Area (Hectare)
Aj	Aghajari formation	64692.6
Q	Deposits and deposits of the present age	52796.19
Mn	Mishan Formation	51334.58
Ajc	Aghajari Formation - sandstone and conglomerate	24346.07
Gr	Gori area	17742.95
Gs	Gachsaran make	14491.28
As	Asmari formation	11687.79
Bgp	Bangestan Group	11016.79
Pd-Gu	Pabdeh-Gurpi make	4898.68

Jk	Khami group Bangestan Group	2644.36
Hs	Hormoz series	1858.52
Lands lide	Landslide	378.09
Bk	Bakhtiari Formation	146.78
Total		258034.65
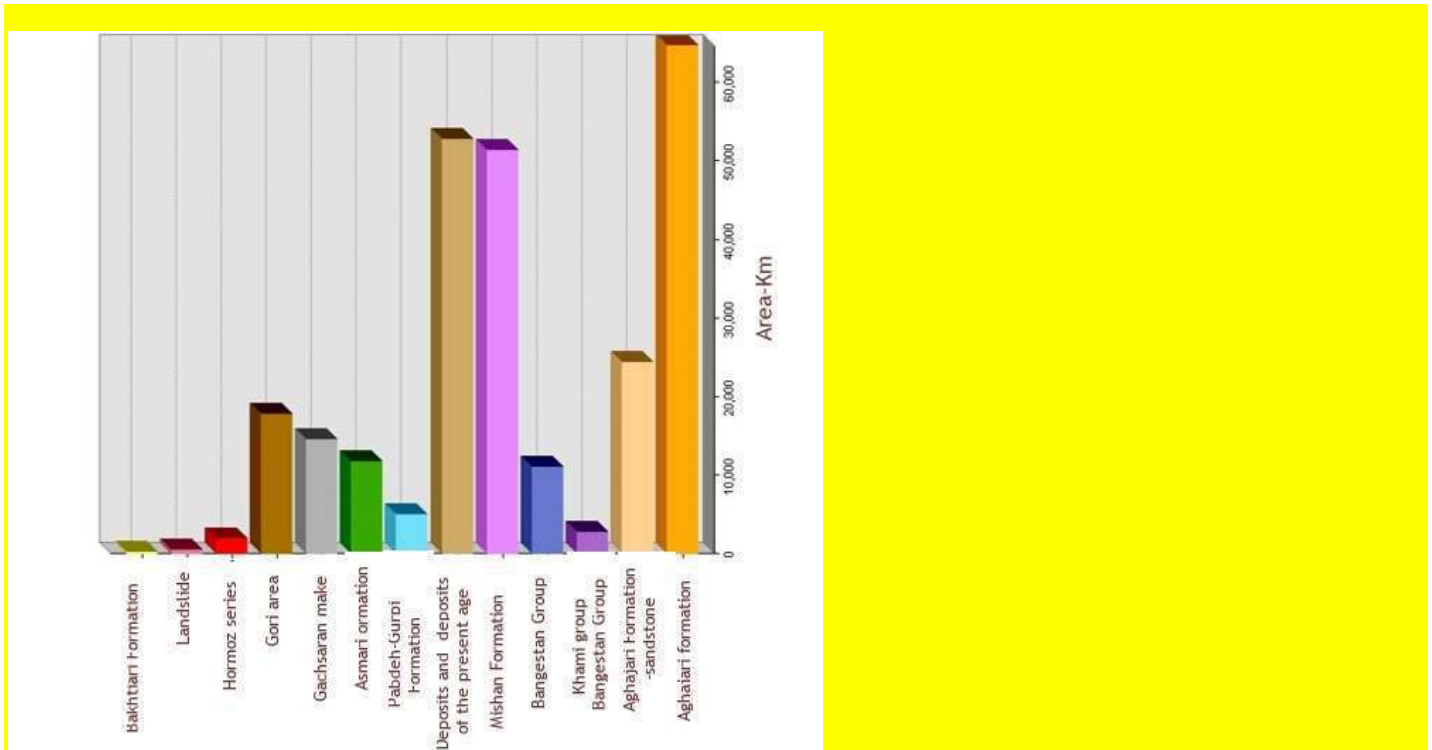
Fig:3. The area of each of the formations in the study area

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TFaults in the area

There are a lot of faults in the range of Dasht Palang Dam that some of these faults were active during the Quaternary and so they are more important. The main fault zone are as follows.
Borazjan fault (B)

Borazjan fault, with a length of about 180 kilometers, is located in the south of the fault Kazeroon. As a result, moving right along this fault in the northwest - southeast of anticlines Khormoj and Giskan and folding it has moved to a North - South and Ghaledokhtar anticline in the center, there is an axis with the north - South direction. Distance from the fault to the dam site is 54 km.

Pishani Koohestan fault (MFF)

This fault is one of the main thrust faults which consists of several separate pieces, and its construction, topographic, land and seismic tectonic important morphological characteristics. This fault is composed of discrete parts of the complex and thrust faults, which varies between 15 and 115 km long, and it includes Chynkhvrdgyha and Byrvnzdgyha of ASMARI Formation limestone. This fault is 15 km from the dam site.

Pishjarfaye Zagros Fault (ZFF)

Pishjarfaye Zagros fault separates Pishjarfaye Zagros belt (in the north and north east), the coastal plain of the Zagros (south and west). This fault is determined, bordering northeastern coastal plain alluvium Persian Gulf, and is a component of reverse fault slip. Pishjarfaye Zagros Fault shows that the 150 km of dextral displacement along active fault Kazeroon-Borazjan. Distance from the fault to the dam, 65 km.

Kenarbandak fault

This fault is a fault close to the dam, which is in plain syncline Leopard, and to the WSW-ENE, and is followed by about 7 kilometers. It seems it is a left-lateral strike-slip (horizontal displacement of about 300 meters). It's nearest terminal to the site about 6 km. The fault, in the valley Knarbndk, there is no sign of movement in the quarter.

Other major faults in a radius of 150 km, are as follows: Sarvestan fault (SF), Kazeroon fault (KZF), Panj shir fault (PSE), Boshgan fault (BF), Keilagh fault (KF), Jegardan fault (JF), Kooh heidar fault (KHF), Tang heidar fault (THF), Kore bas fault, Dasht arjan faults (DAF), Bachon Moordshahrak fault (BMF), Bahim-Koohgarm fault (BGF), JonoobKoohsorkhan fault (SSP), Bando bast fault (BBF), Koodian-Bahim fault (KBF).

Seismicity

Area of the construction division, part of the Zagros simple folded zone, is in the southwest of Iran and sediment and it is often among the chemical and clastic sediments are relatively young, Cenozoic Miojosinklain Zagros, with a thickness of approximately 12,000 meters which was formed mainly of limestone marl and shale. The simple structure of folded Zagros zone is the successive characteristic stalactites and stalagmites which are the northeast - southwest. The folding, near Bandar Abbas and Minab starts, and passes of Hormozgan, Bushehr, Fars, Khuzestan, Chaharmahal Bakhtiari, Kohkiloye va Boyer Ahmad, Kermanshah and Kurdistan and then to Iraq and Turkey and then joins to The Alpine mountain range.

In this context, Barbarian believes that driven by the Folded Zagros, the Seismotectonic has complex features [2]. In his opinion, in this area, shortening the solid crust of the Earth, occurs due to faults in longitudinal movement, in the basement of Precambrian, in all Zagros zone, and seismic faults absorbed, at a depth of 10 km by ductile layers of sedimentary cover Fanerozoik as Hormoz series, Gachsaran formations, etc., and as a result, there is no earthquake fault on the ground

DISCUSSION

Preliminary earthquake hazard zoning map

According to studies conducted by the Ministry of Housing and Urban Development, preliminary zoning map relative risk of earthquake in Iran, have been prepared. Accordingly, Iran has been divided into four zones, with high, high, medium and low risk. This map is presented in an earthquake (2800), in-laws, building design and acceleration on the design proposed for each area. Since the scope of the map is in the category of high risk areas, the acceleration on the project is considered, according to the law of 2800, equal to g 0.30. In this context, the required structures in the project should be resistant to such acceleration. Relative risk by city and zoning earthquake studies in the area of the proposed project are respectively in **Table- 2** and **Figure- 4**.

Table 2: Relative risk of earthquake, according to the city of project site

Description	Amount of relative risk	
Dashtestan City	High relative risk	4
Dashti city	High relative risk	4
Farashband City	High risk	5

GEOLOGY

Fig: 4. Zoning of earthquakes

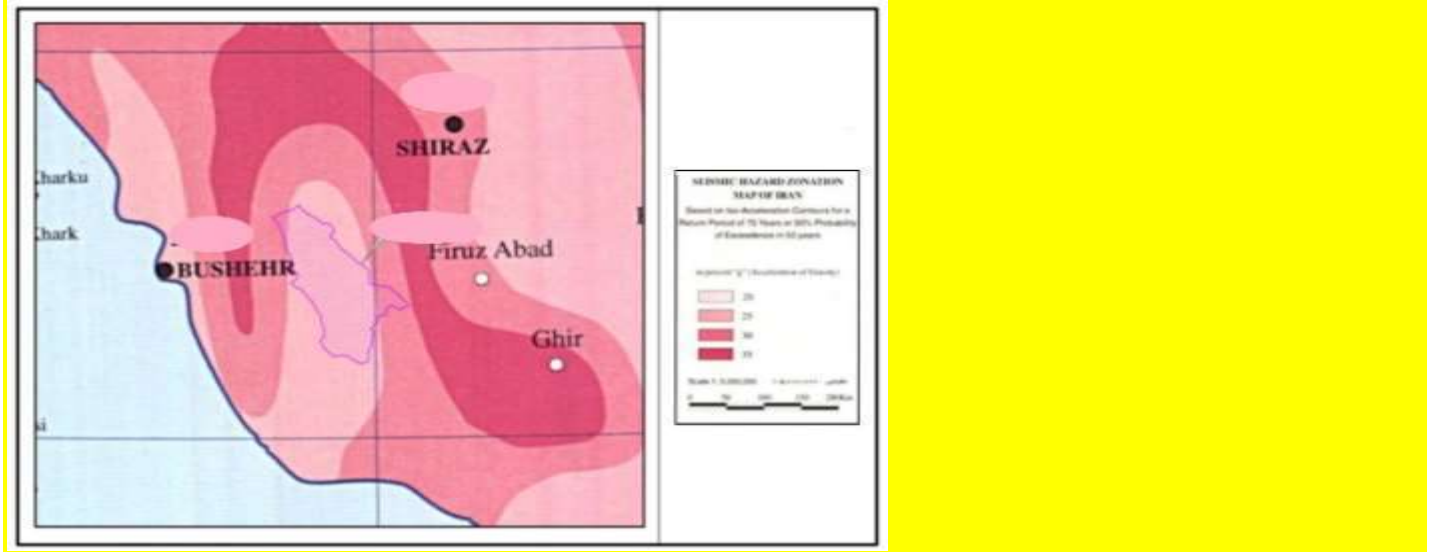..

Calculating the power of seismic faults job

In order to evaluate seismic risks for the region all possible sources of seismic activity should be recognized and their ability to produce a strong movement of the earth in the future, the assessment [3]. In this study, geological maps have been used to determine the major faults in the Dasht Palang Dam. The faults are raised to 150 km radius of the site according to the distance from the site, as well as the faults, 4 faults, which can have more impact on the site have been selected the fault included are, Borazjan fault, Pishani Koohestan fault, Pishjarfaye Zagros fault and the fault Kenarbandak [4]. The analytical method to estimate the parameters of the Earth has been done, based on the possible movement of the entire length of the known faults on the ground in 150 km radius area of Dasht Palang Dam; they are introduced as the earthquake in MCE. Maximizing the potential of each seismic faults based on an average of 4 respect using the empirical relationship between the length of the fault and a great earthquake, earthquake potential of the fault, using the relationship Ambrasise and Melville (1982) for the Middle East , Mohajer Ashjaei & Noroozi (1978), Thatcher (1958) and Press (1967) was calculated in**Table- 3**.
Below, we've noted the relationship between the length and severity of a possible earthquake fault that they have been presented by the researchers:

Equation (1) Ambrasise and Melville (1982) for the Middle East

Log Lr = 0.7 M - 3.24
Equation (2) Mohajer Ashjaei & Noroozi (1978)
M = 5.4 + Log L
Equation (3) Thatcher (1958)
Log Lr = 1.02 M - 5.77
Equation (4) Press (1967)
Ms = 1.061 Log Lr + 5.75

In the above equations, L is equal to half the length of the fault in meters, Lr is equal to half the length of the fault in kilometers and M is a large earthquake on the Richter scale. Empirical formula is to calculate the job of seismic faults usually in relation to the fault of the fault.

Set the maximum magnitude earthquake fault which is estimated in the study area, thus indicating very good for the seismicity of the region and among the largest earthquake of the series, manifests, and the maximum potential earthquake zone by comparing the average magnitude of the fault. It is clear that the maximum expected earthquake (MCE), is having a huge 8.1 for Borazjan fault. Therefore, one can conclude that the maximum potential earthquake fault zone appears by Borazjan .

Table 3: Estimate the creation of a major earthquake faults in the area

Name of fault	maximum magnitude earthquake with the creation earthquake faults				Total length of the fault km
	P	T	M & N	A & M	
Borazjan	8.1	7.9	7.7	7.9	180
Pishani Koohestan	7.9	7.7	7.5	7.6	115
Pish Jarfaye Zagros	8.1	7.8	7.6	7.7	150
Kenar Bandak	6.6	6.5	6.2	5.8	7

Calculate job seismic intensity of faults

The following experimental instructions have been used to calculate the relationship between the maximum earthquake intensity in the macro seismic epicenter (Merkali scale), and magnitude [5]:

Equation (5), Ambrasise and Melville (1982), experimental command
$$I_o = 1.3M_s + 0.09$$

Equation (6) to experimental Mohajer Ashjaei & Noroozi (1978)
$$I_o = 1.7M_s - 2.8$$

In relation to the above is the intensity of the earthquake at the center, and is the maximum magnitude earthquake. The maximum intensity of earthquakes, macro seismic a focus on the faults within the Dasht Palang Dam is calculated in the **Table-4**. By comparing the magnitude and intensity of earthquakes for the faults, it is clear that the maximum expected earthquake (MCE), Ms=7.9 severity of Borazjan fault, I_0=10.8. Therefore, it can be concluded that the maximum potential earthquake zone appears by Borazjan fault.

Table 4: maximum intensity earthquake macroseismic center

Name of fault	Maximum macro seismic intensity of center		maximum magnitude of earthquake
	M & N	A & M	
Borazjan	11	10.6	8.1
Pishani Koohestan	10.3	10.1	7.7
Pish Jarfaye Zagros	10.5	10.2	7.8
Kenar Bandak	7.9	8.3	6.3

Calculation of seismic intensity ranging from site

The maximum intensity of earthquakes are caused by the fault, the site of the dam is calculated in the **Table-5**, according to equation (7)
Equation (7) Corner (1974)   Is = Io +3.72 - 2.99Log h

In the above equation, I_s is the maximum acceleration at the site, Io is the maximum acceleration in the macroseismic center and h is the minimum distance to the fault location.
By comparing the average of the intensity of earthquakes in the area, it is clear that most of the resulting severity of the dam to the maximum expected earthquake, respectively resulting from Kenarbandak fault, Borazjan, Pishjarfaye Zagros and Pishani Koohestan which Borazjan fault brings the most intense earthquake in Dasht Palang Dam area.

Table 5: maximum intensity earthquake site

Name of fault	Maximum intensity at the site in Dasht Palang Dam	minimum distance between faults, the site of Dasht Palang Dam
Borazjan	9.3	54
Pishani Koohestan	10.4	15
Pish Jarfaye Zagros	8.7	65
Kenar Bandak	9.5	6

CONCLUSION

Based on the available data and analysis of seismic faults can be eliminated, it is clear that in the context of the devastating earthquake event Dasht Palang Dam is not unexpected and examined the range, has a history of seismicity. In this study most of faults around the site which likely seismicity are presented. Because, length of the straight section of faults is the only criterion of judgment in this review, faults the distance to the region is low and they can get the highest seismic risk in the study area calculated using the attenuation relationship between the magnitude and duration of the fault, the severity and magnitude of the relationship, the relationship between the intensity and the minimum distance to the fault area, the job seismic, macroseismic intensity of focus and intensity of earthquakes in the area. Of these Borazjan fault, the shear magnitude and intensity of center, respectively 7.9 and 10.8, and Kenar Bandak faults create maximum seismic intensity of 9.5 and Borazjan fault, intensity of 9.3 in the area. In this study, the maximum potential earthquake in the region caused by the fault Borazjan with a length of 180 km which is located at a distance of 54 kilometers from the area and it is considered as the causative fault and most feature earthquake in the region caused by a fault Borazjan with 7.9 magnitudes on the Richter scale.According to the studies performed in the area of citizenship social rights in the Pahlavi era it can be found out that among the items investigated and evaluated regarding the topic of the citizens' social rights, based on the documents, evidences and records it can be concluded that the city of Tehran's citizens' social rights which included as well enjoying the welfare and comfort service facilities were not observed at all by the municipality and the city was generally in a very bad situation and the only places which enjoyed a higher quality and a greater extent of such welfare-service facilities were the regions in which the Shah and the court members and people were residing and it was only them who could enjoy the maximum possible facilities related to their social rights. Also, in the occasions that the municipality undertook measures to develop some of the neighborhoods the results would be nothing more than interference and usurp of the people's holdings and personal estates and this in itself led to discontent in the people of the municipality's undertakings.

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ARTICLE　　**OPEN ACCESS**

THE IMPACT OF OPERATIONAL RISK AND FLUCTUATIONS OF THE INTRINSIC VALUE OF COMPANIES ON THE CONDITIONAL CONSERVATISM IN PHARMACEUTICAL AND THE AUTOMOTIVE INDUSTRY LISTED IN THE TEHRAN STOCK EXCHANGE

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ABSTRACT

This paper investigates the impact of operational risk and fluctuations of the intrinsic value of companies in the pharmaceutical and the automotive industry on conditional conservatism listed on the Stock Exchange of Tehran. For this study, a sample of 50 companies from the pharmaceutical and the automobile industry were selected using random sampling method. In this study, investigating operational risk and fluctuations of the intrinsic value of companies in the pharmaceutical and the automotive industry on conditional conservatism listed on the Stock Exchange of Tehran for the period of 2010 to 2013 took place in Tehran Stock Exchange that a total of 250 observation for the period was used that 125 number years is related to companies with high operational risk and 125 number years related to companies with low operational risk and 125 number years related to the companies with high fluctuations of the intrinsic value and 125 number years related to companies with low fluctuations of intrinsic value. The statistical method used in this research is multiple regression method. The results show that: 1. Companies of pharmaceutical and automotive industry that has low operational risk choose a higher level of conditional conservatism. 2- Companies of pharmaceutical and automotive industry with high operational risk choose lower level of conditional conservatism. 3- Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are lower choose a higher level of conditional conservatism. 4- Companies of pharmaceutical and automotive industry that their fluctuations of intrinsic value are greater choose lower level of conditional conservatism.

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INTRODUCTION

The concept of conservatism

Conservatism is concepts by which accountants use a reasonable degree of caution in the recognition of interactions of subject of economic uncertainty principle.

About accounting conservatism, there are two different views. Some scholars consider conservatism for users and analysts of useful financial statements and consider it as the informational role. Some other researchers not only, not consider it as informational role, but also consider it to the detriment of producers and users of financial statements. In this section, two different views are provided from accounting researchers about conservatism and existing empirical research that support these views.

The first view, conservatism has a positive role and informational load.
Proponents of this view consider informational role for conservatism. According to them, conservatism increases the amount of information reported in the securities market. This increase can help to investors and other users of financial statements to make proper decisions. In fact, this theory has several informational advantages for the conservatism that these advantages are:

Improve the quality of information: conservatism can be effective in improving the quality of information provided by management. In fact, representation theory proves that managers try to increase interests to hide bad news related to company and report good news quickly. Reduce interest of profit management for managers: Chen et al prove that conservatism can play an effective role in reducing the interests obtained of profit management that by senior executives is done.[3]

Conservatism can be a kind of signaling of managers to provide personal information: managers as responsible for preparing the financial statements with fully aware on the situation of company and by having a greater awareness to financial statement users, potentially trying to show the picture of commercial unit a favorable. For example, it may be through appropriating costs of a course as asset caused to reduce costs and report more profit in the financial statements. So the purpose of such an operation is to provide a better picture of the true picture of the company between the users of financial statements. The purpose of gaining profit and award of managers and obtain financing through external parties to company, could be the main reason for such behavior. In fact, conservatism can improve the quality of information and reducing information asymmetry. Conservatism can affect the quality of reported profits. The use of conservative practices in accounting reduces profits reported and increases the quality of accounting profit and since many investors make their decisions based on reported profits, it would be useful for them. [4]

Performance of liability contracts: conservatism causes to reduce conflict of division policy between shareholders and bondholders and reduce the cost of financing. Adherence to conservatism procedures and increasing conservatism reduces the tendency of managers to borrowing and so reducing the cost of financing. In the process of signing a liability contract, lender is faced with the risk of losing principal of capital. So they welcome all the mechanisms that could reduce the risk.[5]

<u>The second view, conservatism reduces the quality of information.</u>
Proponents of this view are the opposite of conservatism. They believe conservatism reduces the quality of information provided in the basic financial statements and it would have huge losses for investors and other users of financial statements. According to this group, higher levels of conservatism is directly associated with the urge to report lower earnings. America Association of Certified Public Accountants (AICPA) believes that conservatism reduces the quality of accounting information, because it can lead to systematic bias and real distort of economic events.

It should be noted that the number of researches that indicates informational role of accounting conservatism and prove its usefulness are several times of researches that consider it to ineffective in reducing information asymmetry.[2]

In view of the above it can be concluded that determine the optimal level of conservatism is a relative matterand this is something that is studies in theory proposed by Wang, O Hogartayg and Van Zijyl (2010).[6]

In recent analytical study, Wang, O Hugartayg and Van Zijyl (2010) defined a new theory of conservatism in accounting that emphasized the role of messaging conservative accounting in the liability market with information asymmetry. According to Basu research (2007), they also consider conservative accounting as accountants tend to know bad news than good news faster. According to their model, conservative accounting is used as a message by which a company borrowing can transfer its personal information about operational risk to the credit company before the contract of financing. This model of messaging conservative accounting has a kind of separate balance, so that companies with low operating risk and fluctuation of low inherent value choose a high level of conservative accounting and companies with high operational risk and great inherent value fluctuations choose low level of conservatism. (Wang et al., 2010).[6]

With regard to the interpretation Basu from conservatism and also based on the fundamental principles of the theory of Wang et al (2010), good and bad news are "value shocks" that affect the value of the company. It is analyzed that the future prospect of companies with low risk is less variable and the current poor performance is most likely specific to the company and on the nature is stable (with constant of other factors) and as a result, managers at these companies have less incentive to postpone identify the bad news.Instead, companies with more risk to take advantage of the opportunities at the time of improving economy and optimizing the value of the company, more willing to postpone the identification of bad news, so it can be concluded that the company seeks to optimize its value chooses proper conservatism of themselves, that choosing companies with more fluctuations,

choosing the low level of conservatism and choosing companies with less fluctuation (more stable) is to choose higher levels of conservatism. This research has utilized the model of intrinsic value to determine fluctuations of intrinsic value of the company and the stability criterion of sales as a measure of operational risk.

As mentioned before, conservatism can reduce information asymmetry between the company and the creditors and investors. Wang et al (2010) also showed that conservative accounting can help to solve this problem by sending a message about the actual level of operational risk of companies to lenders. Due to the higher identification measure that conservatism is imposed in accounting for good economic news than bad news, often economic bad news affect more quickly on profit to good news that Basu (1997) remembered it as "time asymmetry of profit".[7]

MATERIALS AND METHODS

The concept of risk

In today society almost all people are familiar with this concept and acknowledge that all aspects of life are faced with risk. Risk in common language is the danger that happened due to uncertainty about the incident occurring in the future and the more this uncertainty is higher, so it is said that the risk is higher (Rai et al., 2004, 45)

Figure-1 Webster dictionary has defined risk "risk exposure". The vocabulary dictionary of Hildreth investment considers risk investment potential lose that can be calculated (The same, 46). Galitz considers risk any fluctuation in any income, it clear that future changes for a particular index both positive and negative faces us with risk. So it is possible that changes make us benefit or harm (The same, 47).

Two main areas of risk management, which each include their own specific objectives, are:

      1. Domestic area
• ensuring the management about that the company is aware of current and future risks and controls them.

• Protection of assets and corporate reputation

• help to improve the operational performance of the company and increase shareholder value

• Increase efficiency by reducing the potential losses resulting from risk in the activities of the company

• support the achievement of strategic objectives

2. External area

• Ensure compliance with regulatory requirements

• Create competitive advantage

• Assurance to shareholders and other stakeholders that the company is actively managing risks.
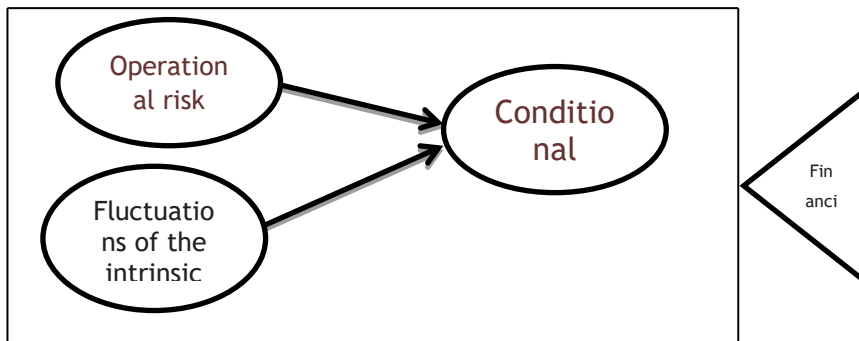
Conceptual model

Fig:1. Research's conceptual model [8]

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Research Hypotheses

- Companies of pharmaceutical and automotive industry that have low operational risk choose a higher level of conditional conservatism.
- Companies of pharmaceutical and automotive industry that have high operational risk choose a lower level of conditional conservatism.
- Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are lower choose a higher level of conditional conservatism.
- Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are greater choose a lower level of conditional conservatism.

RESULTS

In order to better understand the nature of the society that is studied in research and more familiarity with research variables, before the analysis of statistical data, it is necessary to describe the data.

Table:1. Described indicators of research variables, central indicators, dispersion indicators and distribution indicators

Companies with high operational risk					
Symbol	RI	VOL	EPS/P	DR	CV	LEV
The number of data	125	125	125	125	125	125
Mean	0.166546	0.472908	0.161429	0.4	0.239768	0.61898
Median	0.061889	0.442181	0.180129	0	0.212913	0.64506
Mode	-.7846a	-2.2553a	0	0	0.4472	0.2147
SD	0.5569559	1.3027815	0.2758325	0.492	0.1024089	0.2196604
Variance	0.31	1.697	0.076	0.242	0.01	0.048
Skewness	1.986	6	-3.984	0.398	2.176	0.829
Elongation	7.563	52.5	28.715	-1.862	6.831	7.037
Minimum of data	-0.7846	-2.2553	-2.0552	0	0.1396	0.1381
Maximum of data	3.4183	12.7447	1.012	1	0.8287	1.9378
Companies with low operational risk					
Symbol	RI	VOL	EPS/P	DR	CV	LEV
The number of data	125	125	125	125	125	125
Mean	0.180487	0.294941	0.176232	0.44	0.07325	0.640516
Median	0.05198	0.424575	0.154976	0	0.071159	0.643528
Mode	-.7715a	-3.8976a	-.6437a	0	.0095a	0.9441
SD	0.5682364	0.8149234	0.2377381	0.497	0.0406467	0.1580891
Variance	0.323	0.664	0.057	0.247	0.002	0.025

Skewness	1.79	-0.57	2.75	0.262	-0.028	-0.103
Elongation	4.344	8.633	22.883	-1.949	-1.199	0.272
Minimum of data	-0.7715	-3.8976	-0.6437	0	0.0002	0.2147
Maximum of data	2.7544	4.6145	2.0977	1	0.1386	1.0924

Companies with high fluctuations of the intrinsic value						
Symbol	RI	VOL	EPS/P	DR	CV	LEV
The number of data	125	125	125	125	125	125
Mean	0.141977	0.857865	0.180743	0.44	0.167434	0.626725
Median	0.051333	0.447213	0.172617	0	0.151081	0.637287
Mode	-.7715a	.4358a	0	0	0.4472	0.25416
SD	0.5182914	1.1356752	0.2785243	0.497	0.1119117	0.1837739
Variance	0.269	1.29	0.078	0.247	0.013	0.034
Skewness	1.463	7.23	-1.224	0.262	1.049	1.182
Elongation	3.187	65.969	30.368	-1.949	1.608	12.271
Minimum of data	-0.7715	0.4358	-2.0552	0	0.0002	0.12254
Maximum of data	2.4085	12.7447	2.0977	1	0.6273	1.9378

Companies with low fluctuations of the intrinsic value						
Symbol	RI	VOL	EPS/P	DR	CV	LEV
The number of data	125	125	125	125	125	125
Mean	0.193539	-0.131402	0.157587	0.42	0.142608	0.630494
Median	0.070381	0.175182	0.166278	0	0.129605	0.652519
Mode	-.7846a	-4.1580a	0	0	0.4472	0.32154
SD	0.6005729	0.7790633	0.2266727	0.494	0.1094334	0.2019802
Variance	0.361	0.607	0.051	0.244	0.012	0.041
Skewness	1.977	-2.582	-0.775	0.336	1.963	-0.335
Elongation	6.19	8.158	12.408	-1.904	7.403	0.212
Minimum of data	-0.7846	-4.158	-1.291	0	0.0026	0.13254
Maximum of data	3.4183	0.4356	1.3293	1	0.8287	1.1437

[Table-1] shows that the study variables have what characteristics, the first line of this figure suggests that the number of all data for all variables studied is equal to 250 number-year that 125 number- year related to companies with high operational risk and 125 number- year related to companies with low operational risk and 125 number -year related to the companies with high fluctuations of the intrinsic value and 125 number years related to companies with low fluctuations of intrinsic value and the second line shows the mean of collected variables separately, as an example, the mean of return on shares in companies with low fluctuations of intrinsic value is 0.193539. Sixth line of variables' dispersion and variance around the mean show that return on shares in companies with low fluctuations of intrinsic value is 0.361. Seventh and eighth lines of data skewness and elongation to the normal bell-shaped curve show that among the variables of research, return on shares in companies with low fluctuations of intrinsic value with number 1.977 has skewness to the right side and ninth and tenth line describe changes in the largest and smallest numbers as range changes, which for return on shares in companies with low fluctuations of intrinsic value has minimum of data equal to -0.7846 and maximum equal to 3.4183

DISCUSSION

The results of hypothesis testing in [Table-2]

Table: 2. Summary of the results of testing hypotheses

Number of hypothesis	Describing hypothesis	Result of hypothesis	Compare the results of other research
1	Companies of pharmaceutical and automotive industry that have low operational risk choose a higher level of conditional conservatism.	Accepted	The results of the study of Richard and others in 2013 that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis and also Mashayekhi and Motmaen (2013) examined the effect of operational risk on accounting conservatism and argued that in companies with higher operational risk, managers are more motivated to postpone identify the bad news with the hope of good news they concluded that there is a significant negative correlation between operational risk and accounting conservatism as well as the results obtained of this research hypothesis.
2	Companies of pharmaceutical and automotive industry that have high operational risk choose a lower level of conditional conservatism.	Accepted	The results of the study of Richard and others in 2013 that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis and also Mashayekhi and Motmaen (2013) examined the effect of operational risk on accounting conservatism and argued that in companies with higher operational risk, managers are more motivated to postpone identify the bad news with the hope of good news they concluded that there is a significant negative correlation between operational risk and accounting conservatism as well as the results obtained of this research hypothesis.
3	Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are lower choose a	Accepted	The results of the study of Richard and others in 2013 that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive

	higher level of conditional conservatism.		industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis.
4	Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are greater choose a lower level of conditional conservatism.	Accepted	Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are greater choose a lower level of conditional conservatism. The results of the study of Richard and others in 2013 that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis.

CONCLUSION

The first hypothesis test result

Companies of pharmaceutical and automotive industry that have low operational risk choose a higher level of conditional conservatism.

The results of the study of Richard and others in 2013[8]that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis and also Mashayekhi and Motmaen[1] examined the effect of operational risk on accounting conservatism and argued that in companies with higher operational risk, managers are more motivated to postpone identify the bad news with the hope of good news they concluded that there is a significant negative correlation between operational risk and accounting conservatism as well as the results obtained of this research hypothesis.

The second hypothesis test result

Companies of pharmaceutical and automotive industry that have high operational risk choose a lower level of conditional conservatism.

The results of the study of Richard and others in 2013 [8]that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis and also Mashayekhi and Motmaen[1]examined the effect of operational risk on accounting conservatism and argued that in companies with higher operational risk, managers are more motivated to postpone identify the bad news with the hope of good news they concluded that there is a significant negative correlation between operational risk and accounting conservatism as well as the results obtained of this research hypothesis.

The third hypothesis test result

Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are lower choose a higher level of conditional conservatism.

The results of the study of Richard and others in 2013[8] that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis.

The fourth hypothesis test result

Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are greater choose a lower level of conditional conservatism.

The results of the study of Richard and others in 2013[8] that investigated the impact of operational risk and fluctuations of the intrinsic value of companies on conditional conservatism in the pharmaceutical and the automotive industry in America Stock Exchange during years 2000 and 2012 and the results of this study suggest that there is a significant relationship between conditional conservatism with operational risk and fluctuations of the intrinsic value of companies as well as results obtained of this hypothesis in **[Table-3]**.

Offers

Table:3. Offers based on results of research hypotheses

Number of hypothesis	Description of hypothesis	Suggestion
1	Companies of pharmaceutical and automotive industry that have low operational risk choose a higher level of conditional conservatism.	In this study, the relationship between conditional conservatism with operational risk and fluctuation of the intrinsic value is investigated. Operational risk and higher fluctuations of the intrinsic value of companies reduce the manager's incentive to delay the bad news, increase as well as demand for conservatism from the auditors, investors and creditors. Based on these hypotheses and using statistical analysis, significant negative relationship between operational risk and fluctuations of the intrinsic value of companies of automotive and pharmaceutical industry and conservatism were found. This result is consistent with the findings of the 2013 Richard and others. Also, when the results exposed to additional controls that the proxy of demand are for conservatism, including leverage, size and returns retain their explanatory power In other words, a negative correlation between operational risk and fluctuation of intrinsic value of companies of automotive and pharmaceutical industry and conservatism are not subject to the effects of limiting of factors removed, such as leverage, firm size and productivity of the company's stock. The results of these tests were as follows that the effect of operational risk and fluctuation of intrinsic value of companies in the pharmaceutical and automotive industry on conservatism is due to identification postponement of the bad news not due to the accelerated in recognition of good news.
2	Companies of pharmaceutical and automotive industry that have high operational risk choose a lower level of conditional conservatism.	
3	Companies of pharmaceutical and automotive industry that their fluctuations of the intrinsic value are lower choose a higher level of conditional conservatism.	The findings of this study can be interpreted as that operational risk and fluctuation of intrinsic value of companies of pharmaceutical and automotive industry play an important role in shaping the behavior of financial reporting of managers. On the other hand, because managers obtained different returns as a result of recognition of good news versus bad news in profits, for opportunistic reporting have a lot of motives. Conservative limited managerial opportunism and increases the efficiency of liability contracts and reward. Therefore, identification of factors that can be associated with conservatism helps investors in making decisions and facilitating control in policies of investments in companies of the pharmaceutical and automotive industry. Therefore, it is recommended to investors when making economic decisions pay attention to factor of operational risk and fluctuation of intrinsic value of

		companies of automotive and pharmaceutical industry; Because operational risk and fluctuation of intrinsic value of companies of automotive and pharmaceutical industry caused to reduce conservatism. As well as recommended to managers and other stakeholders to increase on conditional conservatism in the companies of pharmaceutical and automotive industry under their management because by increasing levels of conditional conservatism; Operational risk and fluctuations of intrinsic value of the companies will reduce, which ultimately leads to growth and excellence in the companies of automotive and pharmaceutical industry .

Suggestion for future researches

By doing any research, the way will open to future researches and the need for further researches will be felt. The following topics for study by other researchers are suggested that:
Investigating the relationship between operational risk and fluctuations of intrinsic value of companies with accruals quality in the companies of pharmaceutical and automotive industryInvestigating the relationship between operational risk and fluctuations of intrinsic value of companies with return on investments in the companies of pharmaceutical and automotive industryInvestigating the relationship between operational risk and fluctuations of intrinsic value of companies with abnormal returns and value added market in the companies of pharmaceutical and automotive industry Investigating the relationship between operational risk and fluctuations of intrinsic value of companies with abnormal returns and value added market in the companies of pharmaceutical and automotive industryInvestigating the relationship between operational risk and fluctuations of intrinsic value of companies with voluntary disclosure in the companies of pharmaceutical and automotive industry
The relationship between operational risk and volatility inherent value of companies with voluntary disclosure research in the pharmaceutical industry and automotive companies

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RELATIONSHIP BETWEEN LEARNING IN THREE LEVELS AND INNOVATIVE PERFORMANCE WHIT ATTENTION TO ENTREPRENEURIAL CULTURE

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ABSTRACT

The aim of this research was to examine the relationship between learning in three levels (individual, group and organizational) and innovative performance whit attention to entrepreneurial culture. Statistical population include all of the firms in technology parks and incubators of Tehran (30) and Beheshti (15) university as comprehensive universities and Elm-oSanat (1 5) and Sharif (1 5) university as industry universities in Tehran city. One manager and tow employee from every firm (75 managers and 1 50 employee) were the statistic population and among them 1 99 (69 manager and 1 30 employee) answered the questionnaires. Instruments used in this research are the entrepreneurial culture, learning and innovative performance questionnaires. The data was analyzed by means of Pearson correlative and tow way ANOVA. Findings reveal that there is meaningful relationship between learning (in all levels) and innovative performance and entrepreneurial culture can empower this relationship as both independent and mediator variable.

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INTRODUCTION

Complexity of today's world with high rate of change and its accelerating increase requires us to feel the needs for flexibility and change more than ever [1,2,3]. In such situation, only one thing is certain and that is "change". Today's changing world for small and large organizations, which are fighting for survival and hunting transient opportunities and scarce resources, has created a situation which leads us towards entrepreneurship [4] and cause major changes in all aspects of their work and every time they have the ability and the willingness to change their strategy again and again in order to achieve competitive advantages or ability of competitive suggestions with higher quality and less expense [5] because the result of extensive research shows that companies with an entrepreneurial approach have better performance than firms without an entrepreneurial approach [6]. Also, with an inevitable movement towards globalization, the business becomes more complex and uncertain; accordingly customers and their needs are constantly changing. Thus, the organizations have to learn more in order to move toward innovation through producing new products and entrepreneurial activities. In addition, to gain competitive advantages, organizations must learn to use innovative function because, as Kordnaeej et al. [7] thought, the only way to achieve competitive advantage, is innovation and for being innovators, one must maximize learning at individual, group, and organizational levels in an organization (34). Of course, the Matlay and Fletcher [8], as cited in Matlay and Mitra[30], believed that competitive advantage occurs under three conditions of organizational learning, innovation, and knowledge management. Managers should invigorate the decentralized and entrepreneurial organizational culture [4] like fresh blood into the vessels of organization as a living organism because most probably learning and innovation in an entrepreneurial context are the only way that organizations can ensure their durability in the third millennium. That is why entrepreneurship is the basis of all the great changes and improvements that humanity has ever achieved [9].

Increasing attention and emphasis to transferring knowledge and technology out of universities leads to creating and using various mechanisms. One of these mechanisms is science and technology parks and business growth centers [10]. Growth centers and technology parks are among places where young entrepreneurs with low capital are supported to nurture in them spirit of entrepreneurship, managerial thinking, and the power of exposure to the changing world out of the university to be safe from defeat in the beginning of the way. Thus, supporting these

centers and parks which are in a way the birthplace for job and technology can promote the culture of entrepreneurship and innovation in the country and inject it from growth centers into organizations and factories. This way, one can leave the best, greatest, and deepest impact on current crucial situation of entrepreneurship.

It can also be concluded that the current disorganized economic situation is partly due to neglecting categories such as innovation and entrepreneurship in such a way that if enterprises, organizations (including small, medium, and large), and craftsmen learn how to internalize innovative in their organization in the shadow of an entrepreneurial organizational culture, they could better coordinate themselves with economic strong fluctuations and survive in the global competitive arena because, as Beugelsgijk[11] states, organization which has suitable economic growth can benefit from a culture which is called entrepreneurial culture. Governing this type of culture needs to spend money, time, energy and, most important of all, having a long-term vision and a broad leadership insight. But since they need a knowledge-based economy in all around the world for all countries, it is essential to use innovation and entrepreneurship. With a little contemplation, it is clear that spending a lot of time and expense is worth it comparing to the benefits derived from it, such as strengthening the growth centers and technology parks, organizations and companies particularly at the economy and the support of entrepreneurs who ultimately led to expandable innovative performance.

To achieve this goal and by doing some measures such as investing for innovation and learning, considering rewards to innovators [12], managers encourage innovative ideas. But what could be useful in this way, on the one hand, is identifying and solving problems of entrepreneurs and growth centers and technology parks, and, on the other hand, is identifying and analyzing variables and affecting factors on entrepreneurship and innovation.

This article is intended to assess the relationship between learning and innovative performance in companies which are in growth centers and technology parks in the University of Tehran and ShahidBeheshti university as two comprehensive universities and Sharif Industrial university and University of Science and Technology as two industrial universities. Moreover, an entrepreneurial culture can also be defined as an independent variable (here it is assumed as the second independent variable that can impact effectiveness of learning on innovative performance according to the following pattern. [**Figure- 1]**

Therefore, in this study, the effect of learning and organizational entrepreneurial culture is considered as a fixed effect and interactive.
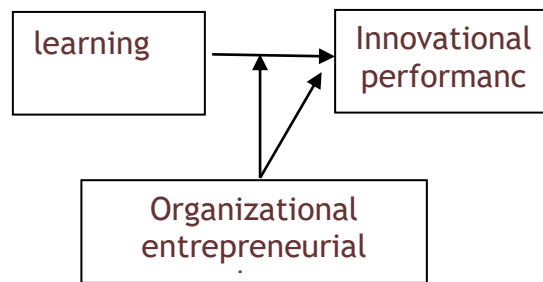

Fig:1. Model of 3 variables in current research
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MATERIALS AND METHODS

Variables and their relationship with each other Learning

OL (organizational learning) is the reflection of high intelligence and ability of productivity learning innovational performance organizational entrepreneurial culture figure1 : model of 3variables in current research that is the result of existing opportunities and commitment to continuous improvement in the organization, as cited in Hazrativiri , [13]. Metsuno et al. define organizational learning as how organizations learn. It refers to the mechanisms that increase possibility of learning and knowledge enhancement in organizations (As cited in Maatofi et al.[14] Knowledge management, learning organization, and organizational learning can be named as three dimensions of learning . In a new classification by Matlay and Mitra[15], knowledge and innovation are

introduced as an entrepreneurial dimension. Organizational learning is part of the management theory which is explained by several factors:

First, the ability of organizations to transfer from production to capital and then work force and finally to intellectual capital. Second, globalization and accelerating business which has an emphasis on organizations' knowledge about the environment; and finally, the most important source of competitive advantage that refers to the organization's capabilities for knowledge creation and its management and learning faster than the competitors [16].

Organizational learning is a process that includes individual, organizational, and inter-organizational levels. Regarding different levels of learning (individual, group, organization), Matlaybelieves that in addition to organizational learning other levels of learning when exposed to important and critical issues also can prevent stress and pressure. AlthoughMatlay believed that organizational learning can be an alternative to the whole individual and group learning, Matlay argued that individual learning in small firms can be useful more than group learning [17]. Kerstenalso regards the group learning as one of the efforts that managers do for learning in theircompany.

Innovative performance

Dehghan et al., [18] states that innovation means creating something new. Innovative is introducing a technological change unit, and indeed the creation of a product, service or a new method. Innovation, according to Schumpeter's (1 952) definition in the mid-twentieth century, is an essential component of entrepreneurship [19]. Also for Drucker innovation is an idea, method, or a subject which is regarded as new by an individual, a group or a system' opinion[20]. As far as the human behavior is concerned, the recency of the idea in objective term is not a matter of time and does not depend on the first use or the time of its discovery but the novelty of idea which is determined by the reactions of a person or group against it.

Innovative performance includes new products, improvement and procedures and new methods in production. Creating Innovation and implementation of a product (goods or service), or a new and completely improved process, is a new marketing method, or a new organizational method in business activities, workplace, organization or external relations. According to Schumpeter innovative is a combination of existing knowledge and organizational learning, but Koght& Zander believed that innovation, in addition to the existing knowledge, refers to creating new knowledge. [21]

RESULTS

Entrepreneurship and entrepreneurial corporate culture

Entrepreneurship is a process of identifying opportunities, innovations to use opportunities, and the venture to create value . Entrepreneurial can be considered as an activity that helps to create employment and add value to the capital or production and the supply of any new product or service [22].

Of course, prior to entrepreneurial culture, one should reach to an understanding of the importance of organizational culture. Organizational culture is one of the most important concepts in the literature related to organizations. Almost all successful organizations in the world have a strong organizational culture. Thinking about the hidden aspect of definitions, which are presented by the scholars in the field of organization, leads us to an understanding of its wide range of effects. A few of the definitions are enumerated below:

□ A set of values and norms and common ideas [23];
□ An ideology and a lever) to indicate what people should do;
□ A tool to facilitate change and create sustainable change , improving the organization and main stimulus of organization success
□ A tool for powerful social control
□ Shared system of meanings ; In addition, Morgan considered the concept of daily rituals as a subset of organizational culture.[24]

Entrepreneurial culture is a subculture of total dominant social culture and organizational culture. Based on the interaction of culture and society, entrepreneurship culture is influenced by other fields of culture, such as values, ethics, religion and political beliefs. Entrepreneurial culture, is a set of values, attitudes, and creative behaviors and innovations that constitute entrepreneurs identity [25].

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Entrepreneurial culture is a shared system of members' beliefs, values and norms of an organization, including giving value to creativity and tolerance of creative people and has ten dimensions: venture, tolerance of creative deviation, fruitless invasion, purposefulness and valuable work, risk taking, open communication, cooperation and collaboration, Innovation, hyperactivity, speech, recreation [26]

DISCUSSION

Review of the literature

In the relationship between these variables, Huang and Wang argued that an organization requires a high degree of entrepreneurial orientation and learning mechanisms to create an environment in which there are mutual relationships between employees and organizations to facilitate learning and innovation. Senge believes that organization knowledge is a combination of internal and external knowledge of organization[27]. Knowledge gained from these two, when applied, is called innovation that ultimately leads to the competencies and advantages for the organization [28].

Bavarsad et al.did a study about relationship between innovation, organizational learning and organizational performance and concluded that organizational learning is affected by innovation. Ganji et al in an article called examining the relationship between organizational entrepreneurship (learning and innovation) and organizational performance in the industrial firms in Lorestan province found that there is a direct link between organizational innovation and learning and innovative performance[29]. Javanmard noted in his dissertation that there is a relationship between components of organizational learning and organizational performance in the companies accepted in Tehran Stock Exchange [30].

The results of another research carried out about the role of organizational learning in the relationship between innovative performance and total quality management (TQM) by MobasherAmini et al., [31] were indicative of a strong relationship between learning and innovative performance.

Javanmard and Sakha'i in a research investigate the relationship between organizational innovation and performance in the industries concluded that individual's skills have positive relationship with organizational performance and there is a direct and positive relationship between interpersonal skills and organizational learning and innovation[4]. Hurly and Hort showed a positive relationship between innovation and learning.[32]

Lavvaf and Hashfy showed that avoidance of innovation has a negative impact on organizational performance. .They also concluded that organizational learning has a direct relationship with and effective on innovation and learning on performance. Moon et al. in a study under the title of "Organizational innovation: A contingency framework in 1 998" concluded that development of learning in various forms (individual, team, and organizational) was an important factor in organizations economic success and is known as one of the most important indicators of and innovation performance[Figure-2]. Lundvall also consider knowledge as the most strategic source and learning as the most important process in the organization that are simultaneously affective in creating innovation. [33]. Barney (1991), considering innovation as one of the most important ways to achieve competitive advantage, classified the following model to describe the relationship between resources, innovation and the innovative performance.[34]

In [Figure-3]As a result of their study, Chen et al. offered the following models and also stated that learning and innovation performance are two different concepts: the first one emphasizes on the importance of knowledge attraction and the second one emphasizes on changing organization in future: [35,36]

Research hypotheses
 There is a relationship between innovative performance and learning.
 There is a relationship between entrepreneurial culture and innovation performance.
 There is a relationship between learning and the entrepreneurial culture.
 Learning and entrepreneurial organizational culture, either separately or in aggregate have an impact on innovative performance.
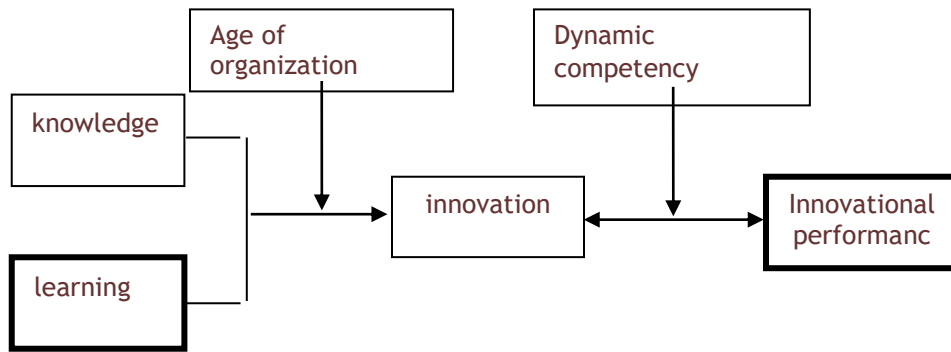 The industrial universities outperformed the comprehensive universities regarding the mean index of their scores..

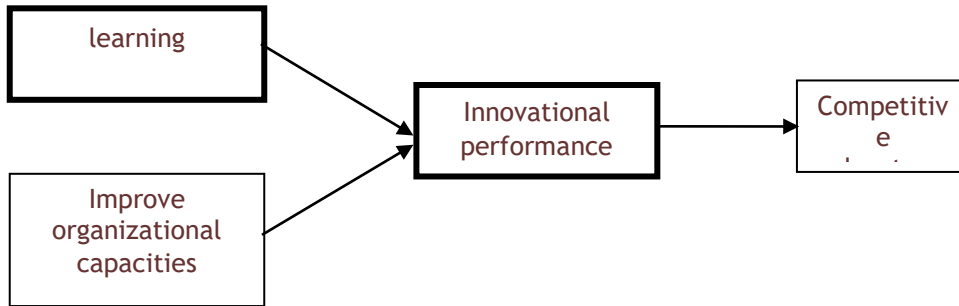**Fig:2. Berney model for relationship between sources innovation and performance**

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Fig: 3. Chen et al model for variables related with competitive advantages

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METHOD

The population of this study included all companies located in, both University of Tehran and ShahidBeheshti University as comprehensive universities and both Sharif Industrial University and University of Science and Technology as technical universities. In **[Table- 1]** Using stratified random sampling method, managers and two of their staff were selected to administer the questionnaires for three variables of the study. 88 percent of the questionnaires were answered and returned. The following table illustrates the steps taken for the distribution and collection of questionnaires:

Table: 1 . process of distribution and gathering of questionnaires

R	univercity	Firms	Society		Gathered questionnaires	
			manager	Employee	manager	Employee
1	Tehran	30	30	60	29	53
2	Shahidbeheshti	15	15	30	14	28
3	Sharif	15	15	30	12	24
4	Elm-o- sanat	15	15	30	14	26
	Total	75	75	135	69	130
		Total	225		199	

To collect data about the entrepreneurial organizational culture, entrepreneurial organizational culture questionnaire designed by Maguire at George Washington University in 2003 was used. Its reliability coefficient was 0.76. To gather information about individual, group and organizational learning, a questionnaire with the same name was used. The reliability coefficient was calculated to be 84.7 .). Innovative performance questionnaire Catherine et al with the reliability coefficient 80.3 was also administered to collect data about innovative performance .

RESULTS AND CONCLUSIONS

First hypothesis:

The results in [**Table- 2**] show that the correlation between learning and innovative performance is so low that it can be ignored. Therefore, the first research hypothesis is rejected:

Table: 2. Pearson correlation for relationship between learning and innovational performance

N	correlation	Sig (2-tailed)
199	-/068	/337

According [**Table- 3**], there is a relationship between entrepreneurial organizational culture and innovative performance and the second research hypothesis can be confirmed:

Table: 3. Pearson correlation for relationship between enterpreneurialculture and innovational performance

N	Correlation	Sig (2- tailed)
199	-/1 44	/042

The data displayed in [**Table -4**] reveal that there is a relationship between learning and entrepreneurial organizational culture. This can reject the null hypothesis. The third research hypothesis is also confirmed:

Table: 4. Pearson correlation for relationship between entrepreneurial culture and learning

N	correlation	Sig (2- tailed)
199	/400	/000

In[**Table- 5**] also, to analyze the interaction of three variables under investigation, two-way analysis ofvariance was used to observe the fixed effects of independent variables (learning) and the mediator variable (entrepreneurial organizational culture), and to study the interaction of these two variables. The results of analyzing the data in the following table showed that the independent and mediator variables have an impact on dependent variables separately and in aggregate. Hence, the null hypothesis is rejected and the proposed model is approved:

Table: 5. Tow way ANOVA for fix and interaction effects

variable variable	df	Mean square	F	sig
Learning	41	160.669	3.967	.002
enterpreneurialculture	48	110.534	2.729	.013
enterpreneurialculture * learning	91	104.955	2.591	.015

[**Table-6**]Examining and comparing the scores of universities revealed that industrial universities outperformed the comprehensive ones not only in the innovative variable but also in all other variables; therefore, the hypothesis is confirmed. The scores of the universities are summarized in the [**Table-6**] below:

Table: 6. Mean of university marks of three variables

University	Variables	Entrepreneurial culture	Innovational performance	Learning (individual, group, organizational)

Tehran	71/62	97/69	94/81
Shahibbeheshti	61/77	98	85/65
Sharif	75/64	95/78	92/54
Elm- o – sanat	69/13	102	96/02
Sum of comprehensive universities	133/39	195/69	180/46
Sum of industrial universities	144/77	197/78	188/56

can also be concluded from the results that learning at all levels, including individual, group, organizational and inter-organizational, always leaves a positive impact on the organization. Subsequently, the innovative performance is one of the organizational variables that takes the positive effects of learning. Besides learning, the entrepreneurial atmosphere should also be supported in the organization. As organizational culture is well-defined in management books, it can be a facilitator of change and a guide for behavior. Thus, entrepreneurial organizational culture can imagine an atmosphere to facilitate the process of entrepreneurship, and give courage to employees to move towards discovering the unknown.

According to the results obtained from the data analysis, the researcher can confirmed the hypotheses related to the relationship between learning, innovative performance, and inevitable impact of entrepreneurial organizational culture. Therefore, managers must ensure that if they wisely support the entrepreneurial organizational culture in their organization and facilitate the learning process, they will have innovative and creative employees and dynamic organization.

CONFLICT OF INTEREST
None

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ARTICLE　　**OPEN ACCESS**

CHARACTERISTIC BASED SPLIT SCHEME FOR INCOMPRESSIBLE NAVIER-STOKES EQUATIONS

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ABSTRACT

In this paper characteristic based split finite element (CBS-FEM), is used for the solution of incompressible flow problems. A remarkable advantage of this method is its capability to solve the compressible and incompressible flow problems for any Reynolds number with the same code. Temporal and spatial discretization of the governing equations in this method is elaborated. And at last two benchmark 2D numerical examples of Navier-Stokes (N-S) equations are used to present the CBS finite element properties and performances. Sensitivity analysis on time step size is also carried out and results are presented

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INTRODUCTION

It is known that numerical solutions of incompressible Navier–Stokes equations may suffer from numerical instability due to convective character of the equations often leading to oscillatory solutions if the standard Galerkin procedure is used to discretize the equations, as the standard Galerkin method is only valid for self-adjoint operator equations.

Some methods such as Petrov-Galerkin introduced by Zienkiewicz and coworkers [1], streamline Petrov-Galerkin (SUPG) which is the extension of Petrov-Galerkin in two and three dimensions[2], Taylor-Galerkin presented by Donea that is proved to be the finite element equivalent of the Lax-Wendroff method developed in finite difference context[3],Galerkin least square (GLS) that is a linear combination of standard Galerkin and least square approximations[4] and finite increment calculus (FIC) presented by Onate[5] are developed to overcome the instability due to high convective terms.

Another difficulty arises when incompressible Navier-Stokes equations are encountered is that there is no pressure evolution in continuity equation. One of the very popular procedures of dealing with the pressure terms in incompressible Navier-Stokes equations is the fractional step or projection method initially presented by Chorin in the finite difference context[6,7]. In the projection method, a modified version of the momentum equation in discretized form is first advanced in time to provide an approximation for the velocity field at the next time level. The intermediate velocity field will not, in general, satisfy the divergence-free condition for incompressible flow. The velocity correction or projection step involves the solution of a Poisson equation for pressure (or pressure correction) that is derived from the enforcement of the continuity equation. The pressure correction thus obtained is used to modify the intermediate velocity field. This procedure yields to a mixed formulation, which sometimes restricts the choice of interpolation spaces for the velocity and pressure fields. In finite element context several researchers have used the fractional step method for incompressible flow problems [8-10].

Present study uses characteristic based split finite element for the solution of incompressible flow problems. In what fallows, section 2 states governing equations on fluid flows (Navier-Stokes equations). In section 3, characteristic based split algorithm is explained by two parts termed temporal discretization schema and spatial discretization schema. Section 4 and 5 relates to time restriction criteria and CBS flowchart respectively. And finally in section 6 some numerical examples are described and solved by CBS algorithm.

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MATERIALS AND METHODS

Navier-Stokes equations

The Navier-Stokes equations in conservation form may be written as [11]:

Mass conservation equation

$$\frac{\partial \rho}{\partial t} = \frac{1}{c^2}\frac{\partial p}{\partial t} = -\frac{\partial(U_i)}{\partial x_i} \qquad (1)$$

Where c is the speed of sound, and $U_i = \rho u_i$ in which ρ is density and u_i is velocity components. It is obvious for incompressible flow speed of sound approaches infinity and the left hand term approaches zero.

Momentum conservation equation

$$\frac{\partial(U_i)}{\partial t} = -\frac{\partial(u_j U_i)}{\partial x_j} + \frac{\partial(\tau_{ij})}{\partial x_j} - \frac{\partial(p)}{\partial x_i} - \rho g_i \qquad (2)$$

Where τ_{ij} is the deviatoric stress components may obtain by:

$$\tau_{ij} = \mu\left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i} - \frac{2}{3}\delta_{ij}\frac{\partial u_k}{\partial x_k}\right) \qquad (3)$$

Where μ is the dynamic viscosity and δ_{ij} is the kroneker delta:

$$\delta_{ij} = \begin{cases} 1 & i = j \\ 0 & i \neq j \end{cases} \qquad (4)$$

Characteristic Based Split Finite Element Method

The CBS scheme is very similar to the original Chorin split or the projection method which is widely employed in incompressible flow calculations. Furthermore it can be used for compressible and incompressible flows. The temporal discretization scheme essentially contains three steps. In the first step, the intermediate velocity field is established. in the second step, the pressure is obtained from continuity equation and finally the intermediate velocities are corrected to get the final velocity values.All three set of equations can be spatially discretized by standard Galerkin procedure [11].

Temporal discretization

Discretization of the momentum equation (Eq.2) in a typical time interval $[t_n \quad t_{n+1}]$ with $\Delta t = t_{n+1} - t_n$, Using characteristic procedure leads to:

$$U_i^{n+1} - U_i^n = \Delta t\left[-\frac{\partial}{\partial x_j}\left(u_j U_i\right)^n + \frac{\partial \tau_{ij}^n}{\partial x_j} + \frac{\partial p^{n+\theta_2}}{\partial x_i} - \left(\rho g_i\right)^n\right] +$$
$$+ \frac{\Delta t^2}{2}\left[u_k\frac{\partial}{\partial x_k}\left(\frac{\partial}{\partial x_j}\left(u_j U_i\right) - \frac{\partial p}{\partial x_i} + \rho g_i\right)\right]^n \qquad (5)$$

In which $\theta_2 \epsilon[0 \quad 1]$ and $\theta_2 = 0,0.5,1$ lead to explicit form, Crank-Nicolson semi implicit form and fully implicit form, respectively.
An auxiliary variable U^* is introduced in such a way that the characteristic based split of Eq. (5) is written in the form of equations (6) and (7):

$$U_i^* - U_i^n = \Delta t \left[-\frac{\partial}{\partial x_j}\left(u_j U_i\right)^n + \frac{\partial \tau_{ij}^n}{\partial x_j} + \eta \frac{\partial p^n}{\partial x_i} - \left(\rho g_i\right)^n \right]$$

(6)

$$+ \frac{\Delta t^2}{2}\left[u_k \frac{\partial}{\partial x_k}\left(\frac{\partial}{\partial x_j}\left(u_j U_i\right) - \eta \frac{\partial p}{\partial x_i} + \rho g_i \right)^n \right]$$

$$U_i^{n+1} - U_i^* = \Delta t \left[(1-\eta)\frac{\partial p^n}{\partial x_i} + \theta_2 \Delta t \frac{\partial \Delta p}{\partial x_i} + (1-\eta)\frac{\Delta t}{2} u_k \frac{\partial}{\partial x_k}\frac{\partial p^n}{\partial x_i} \right]$$

(7)

Where$\Delta p = p^{n+1} - p^n$.Two types of splitting can be considered byη parameter with$\eta = 0$ corresponding to split A (non-iterative splitting scheme) in which all pressure term in momentum equation are splitted and $\eta = 1$ corresponding to split B (iterative splitting scheme) in which only the pressure terms at thet^{n+1} are splitted. Rewriting equation (7) neglecting higher order terms yields to:

$$U_i^{n+1} - U_i^* - U_i^n + U_i^n = \Delta t \left[(1-\eta)\frac{\partial p^n}{\partial x_i} + \theta_2 \Delta t \frac{\partial \Delta p}{\partial x_i} + (1-\eta)\frac{\Delta t}{2} u_k \frac{\partial}{\partial x_k}\frac{\partial p^n}{\partial x_i} \right]$$

(8)

Considering$\Delta U_i^* = U_i^* - U_i^n$, $\Delta U_i = U_i^{n+1} - U_i^n$

$$\Delta U_i = \Delta U_i^* - \Delta t \left[(1-\eta)\frac{\partial p^n}{\partial x_i} + \theta_2 \Delta t \frac{\partial \Delta p}{\partial x_i} \right]$$

(9)

Similarly, the temporal discretization of the continuity equation is written as:

$$\Delta \rho = \left(\frac{1}{c^2}\right)^n \Delta p = -\Delta t \frac{\partial U_i^{n+\theta_1}}{\partial x_i} = -\Delta t \left[\frac{\partial U_i^n}{\partial x_i} + \theta_1 \frac{\partial \Delta U_i}{\partial x_i} \right]$$

(10)

Considering Eqs. (9) and (10) vanishing higher other terms leads to Eq. (11):

$$\Delta \rho = \left(\frac{1}{c^2}\right)^n \Delta p = -\Delta t \left[\frac{\partial U_i^n}{\partial x_i} + \theta_1 \frac{\partial \Delta U_i^*}{\partial x_i} - \Delta t \theta_1 \left((1-\eta)\frac{\partial^2 p}{\partial x_i \partial x_j} + \theta_2 \frac{\partial^2 \Delta p}{\partial x_i \partial x_j} \right) \right]$$

(11)

Spatial discretization
The unknown variables U and P are spatially approximated using standard shape functions$N_u$and$N_p$as followings.

$$\mathbf{U} = \mathbf{N_u}\overline{\mathbf{U}}, \Delta\mathbf{U} = \mathbf{N_u}\Delta\overline{\mathbf{U}}, \Delta\mathbf{U}^* = \mathbf{N_u}\Delta\overline{\mathbf{U}}^*, p = \mathbf{N_p}\overline{\mathbf{p}}, \mathbf{u} = \mathbf{N_u}\overline{\mathbf{u}}$$

(12)

Using the standard Galerkin procedure, the weak form of equations (6) can be written as:

$$\Delta\mathbf{U}^* = -\mathbf{M_u}^{-1}\Delta t\left[\left(\mathbf{C_u}\overline{\mathbf{U}} + \mathbf{K_r}\overline{\mathbf{u}} + \eta\mathbf{G}^T\overline{\mathbf{p}} - \mathbf{f}\right) - \Delta t\left(\mathbf{K_u}\overline{\mathbf{U}} + 0.5\eta\Delta t\mathbf{P}\overline{\mathbf{p}} + \mathbf{f_s}\right)\right]^n$$

(13)

Where

$$\mathbf{M_u} = \int_\Omega \mathbf{N_u}^T\mathbf{N_u}\,d\Omega$$

(14)

$$\mathbf{C_u} = \int_\Omega \mathbf{N_u}^T\left(\nabla\left(\mathbf{u}\mathbf{N_u}\right)\right)d\Omega$$

(15)

$$\mathbf{f} = \int_\Omega \mathbf{N_u}^T\rho\mathbf{g}\,d\Omega + \int_\Gamma \mathbf{N_u}^T\mathbf{t^d}\,d\Gamma$$

(16)

$$\mathbf{K_r} = \int_\Omega \mathbf{B}^T\mu(\mathbf{I_0} - \frac{2}{3}\mathbf{m}\mathbf{m}^T)\mathbf{B}\,d\Omega$$

(17)

$$\mathbf{m} = \begin{bmatrix} 1 & 1 & 1 & 0 & 0 & 0 \end{bmatrix}^T$$

(18)

$$\mathbf{g} = \begin{bmatrix} g_1 & g_2 & g_3 \end{bmatrix}^T$$

(19)

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$$\mathbf{I_0} = \begin{bmatrix} 2 & 0 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \tag{20}$$

$$\mathbf{G} = \int_\Omega (\nabla \mathbf{N}_p)^T \mathbf{N}_u d\Omega \tag{21}$$

$$\mathbf{P} = \int_\Omega \left(\nabla\left(\mathbf{u}\mathbf{U}_u\right)\right)^T \nabla \mathbf{N}_p d\Omega \tag{22}$$

Spatial discretization of Eq. (11) using a Galerkin method leads to:

$$\int_\Omega N_p^k \Delta\rho \, d\Omega = \int_\Omega N_p^k (\frac{1}{c^2}) \Delta p \, d\Omega =$$

$$-\Delta t \int_\Omega N_p^k \frac{\partial}{\partial x_i} \left(U_i^n + \theta_1 \Delta U_i^* - \theta_1 \Delta t \left((1-\eta)\frac{\partial p^n}{\partial x_i} + \theta_2 \frac{\partial \Delta p}{\partial x_i} \right) \right) d\Omega \tag{23}$$

With a weak form defined as:

$$\int_\Omega N_p^k \Delta\rho \, d\Omega = \int_\Omega N_p^k (\frac{1}{c^2}) \Delta p \, d\Omega =$$

$$-\Delta t \int_\Omega \frac{\partial N_p^k}{\partial x_i} \left(U_i^n + \theta_1 \Delta U_i^* - \theta_1 \Delta t \left((1-\eta)\frac{\partial p^n}{\partial x_i} + \theta_2 \frac{\partial \Delta p}{\partial x_i} \right) \right) d\Omega$$

$$-\Delta t \int_\Gamma N_p^k \left(U_i^n + \theta_1 \Delta U_i^* - \theta_1 \Delta t \left((1-\eta)\frac{\partial p^n}{\partial x_i} + \theta_2 \frac{\partial \Delta p}{\partial x_i} \right) \right) n_i \, d\Gamma \tag{24}$$

Equation (24) can be shown in matrix form as follows:

$$\left(\mathbf{M_p} + \Delta t^2 \theta_1 \theta_2 \mathbf{H} \right) \Delta\bar{p} = \Delta t \left[\mathbf{G}\bar{\mathbf{U}}^n + \theta_1 \mathbf{G}\Delta\bar{\mathbf{U}}^* - \Delta t \theta_1 \mathbf{H}\bar{\mathbf{p}}^n - \mathbf{f}_p \right] \tag{25}$$

In which

$$\mathbf{H} = \int_\Omega (\nabla \mathbf{N}_p)^T \nabla \mathbf{N}_p d\Omega \tag{26}$$

$$\mathbf{M_\rho} = \int_\Omega \mathbf{N}_p^T (\frac{1}{c^2})^n \mathbf{N}_p d\Omega \tag{27}$$

$$\mathbf{f}_p = \Delta t \int_\Gamma \mathbf{N}_p^T \mathbf{n}^T \left[\bar{\mathbf{U}}^n + \theta_1 \left(\Delta\bar{\mathbf{U}}^* - \Delta t \nabla p^{n+\theta_2} \right) \right] d\Gamma \tag{28}$$

$$\mathbf{n} = \begin{bmatrix} n_1 & n_2 & n_3 \end{bmatrix}^T \tag{29}$$

And finally equation (9) can also be discretized as:

$$\int_\Omega N_u^k \Delta U_i^{n+1} d\Omega = \int_\Omega N_u^k \Delta U_i^* d\Omega - \Delta t \int_\Omega N_u^k \left(\frac{\partial p^n}{\partial x_i} + \theta_2 \frac{\partial \Delta p}{\partial x_i} \right) d\Omega$$

$$-\frac{\Delta t^2}{2} \int_\Omega \frac{\partial(u_j N_u^k)}{\partial x_j} \frac{\partial p^n}{\partial x_i} d\Omega \tag{30}$$

This equation can be represented in the matrix form as:

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$$\Delta \overline{\mathbf{U}} = \Delta \overline{\mathbf{U}}^{*} - \mathbf{M}_{u}^{-1} \Delta t \left[\mathbf{G}^{T} (\overline{\mathbf{p}}^{n} + \theta_{2} \Delta \overline{\mathbf{p}}) + \frac{\Delta t}{2} \mathbf{P} \overline{\mathbf{p}}^{n} \right] \tag{31}$$

RESULTS

Stability criteria

This algorithm will always contain an explicit portion in the first characteristic-Galerkin step. However the second step, i.e. that of the determination of the pressure increment, can be made either explicit or implicit and various possibilities exist here depending on the choice of θ_2. Different stability criteria will apply depending on the choice of the parameter θ_2 as zero or non-zero being fully explicit or semi-implicit, respectively.

It is necessary to mention that the fully explicit form is only possible for compressible flow problems for which $c \neq \infty$. In fully explicit form where $0.5 \leq \theta_1 \leq 1$ and $\theta_2 = 0$, the time step limitation is defined as:

$$\Delta t \leq \frac{h}{c + |\mathbf{U}|} \tag{32}$$

as viscosity effects are generally negligible here [11].

The semi-implicit forms defined by $0.5 \leq \theta_1 \leq 1$ and $0.5 \leq \theta_2 \leq 1$ are conditionally stable with the permissible time step size defined by:

$$\Delta t \leq \frac{h}{|\mathbf{U}|} \tag{33}$$

and

$$\Delta t \leq \frac{h^2}{2\nu} \tag{34}$$

Where h is the measure of mesh size and ν is the kinematic viscosity. Study of Guermond and Quartapelle showed that the splitting methods cannot usually satisfy the LBB (Ladyzhenskaya-Babuska-Brezzi) compatibility condition [12,13]. In the iterative splitting scheme (split B), the velocity-pressure pair must satisfy the LBB condition to obtain non-oscillatory numerical results. By contrast with non-iterative splitting scheme (Split A), equal order interpolations could be safely used, provided the time step is not too small with respect to the spatial mesh size, in the sense that $\Delta t \geq a h^k$, where k is the velocity interpolation order, h a measure of the mesh size and a is a coefficient [14]. Minev presents a discussion on which splitting method requires an LBB compliant approximation and which do not [15].

DISCUSSION

CBS algorithm for Navier-Stokes equations

To solve Navier-Stokes equations using CBS, one has to consider following steps:

1- Choosing η to select splitting scheme ($\eta = 0$: split A and $\eta = 1$: split B). often split A (non-iterative splitting) is recommended for its property on satisfying LBB compatibility condition.
2- Selecting Δt by considering section 4
3- Obtaining $\Delta \overline{\mathbf{U}}^{*}$ from equation (13).
4- Calculating pressure change from equation (25).
5- Computing $\Delta \overline{\mathbf{U}}$ using equation (31).
6- Completing time step calculation.
7- Advancing to the next time step and repeating steps $3 - 6$.

Numerical examples

Two well known examples, the lid-driven cavity and backward facing step are used to demonstrate the capability and performance of the proposed schemes.

Lid-driven cavity

As the first example a lid-driven cavity flow problem is considered as shown in **[Figure- 1]**. The top lid of a square and closed cavity (1.0m×1.0m) is assumed to move in its plane with certain uniform prescribed velocity (1.0 m/s). All other walls are assumed to be stationary with zero velocity components imposed on them (no slip walls). Flow is considered laminar and incompressible.
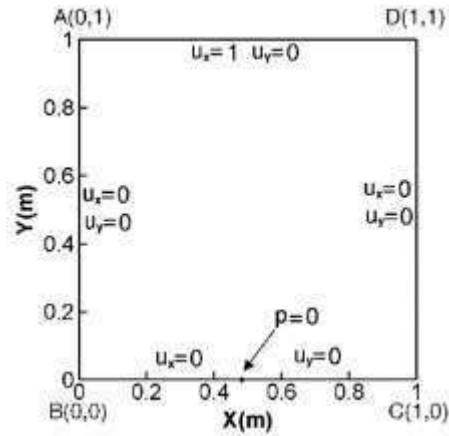

Fig:1. lid-driven cavity and its boundary conditions

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The boundary conditions for the velocities are $u_x = 0.0$, $u_y = 0.0$ on the boundaries AB, BC, CD and $u_x = 1.0$, $u_y = 0.0$ on the boundary AD and pressure boundary condition is p = 0 at the point E.

Using a mesh, illustrated in **[Figure- 2]**, the steady state solution for the example problem is presented. The problem is solved with three different Reynolds numbers, $Re = 100$, $Re = 500$ and $Re = 5000$ with the characteristic velocity U and characteristic length L used to calculate Reynolds numbers are chosen $1.0\ m/s$ and $1.0\ m$ for this example, respectively. Pressure contours, Streamlines and flow pattern for Re=5000 and $\Delta t = 0.001\ s$ are illustrated in **[Figure- 3 to 5]** respectively.
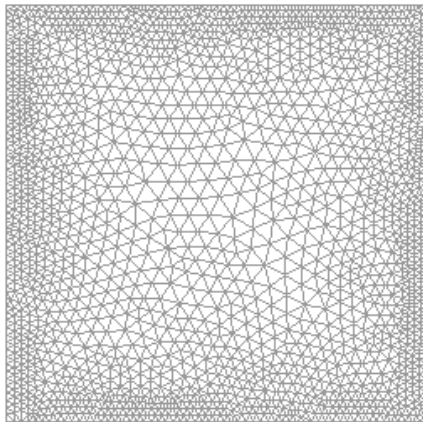

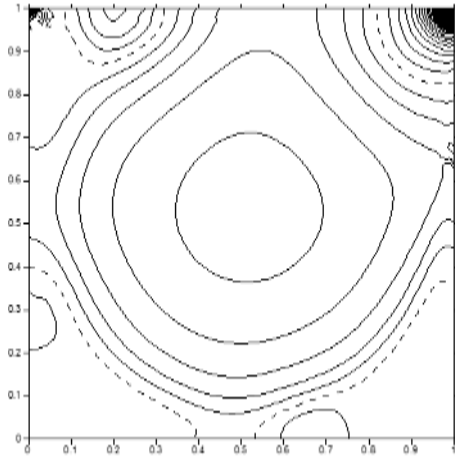**Fig: 2. Triangular meshing with 3438 elements and 1836 nodes**

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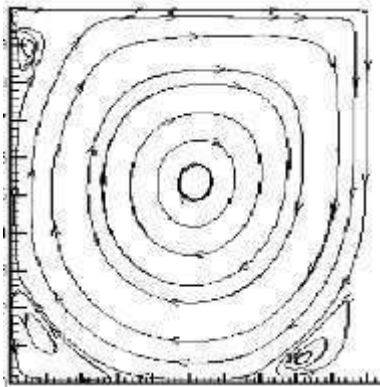
.

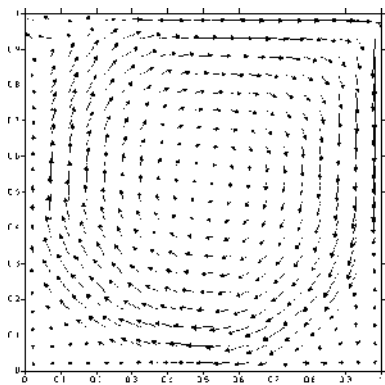**Fig: 3. P contours for Re=5000**

Fig: 4. Streamline for Re=5000

Fig: 5. Flow pattern for Re=5000

U profile at x=0.5 for different Reynolds number (Re=100, Re=500, Re=5000) by$\Delta t = 0.001\,s$ are plotted in **[Figure-6]** Also observed data (by Ghia) and CBS results for Re=5000 are illustrated in **[Figure-7]** Result by CBS and Ghia shows good similarity.
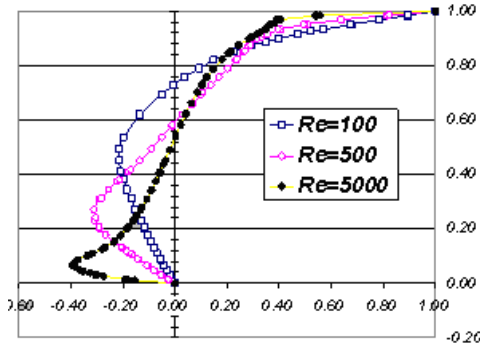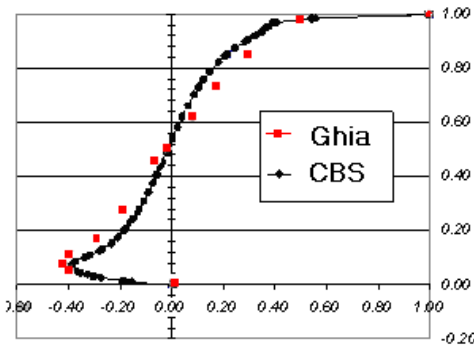
Fig: 6- U profile at x=0.5 for different Reynolds number

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Fig: 7. U profile at x=0.5 with CBS and observed data for Re=5000

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To investigate the time increments effect on the steady state solution, the cavity flow problem is solved using the mesh illustrated in [**Figure- 8**] for Re=100 with four increments $\Delta t = 0.009\ s$, $\Delta t = 0.001\ s$, $\Delta t = 0.0005\ s$ and $\Delta t = 0.00005\ s$. The pressure contours for each Δt are illustrated in **[Figure-9]**. It is obvious that smaller time increments size tend to constitute the oscillating pressure field. As expected very small Δt, is lead to oscillatory results
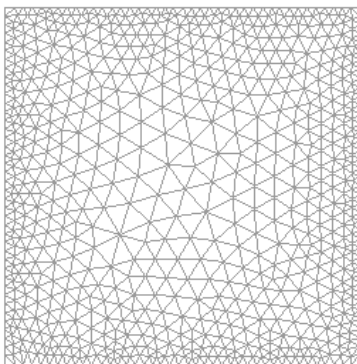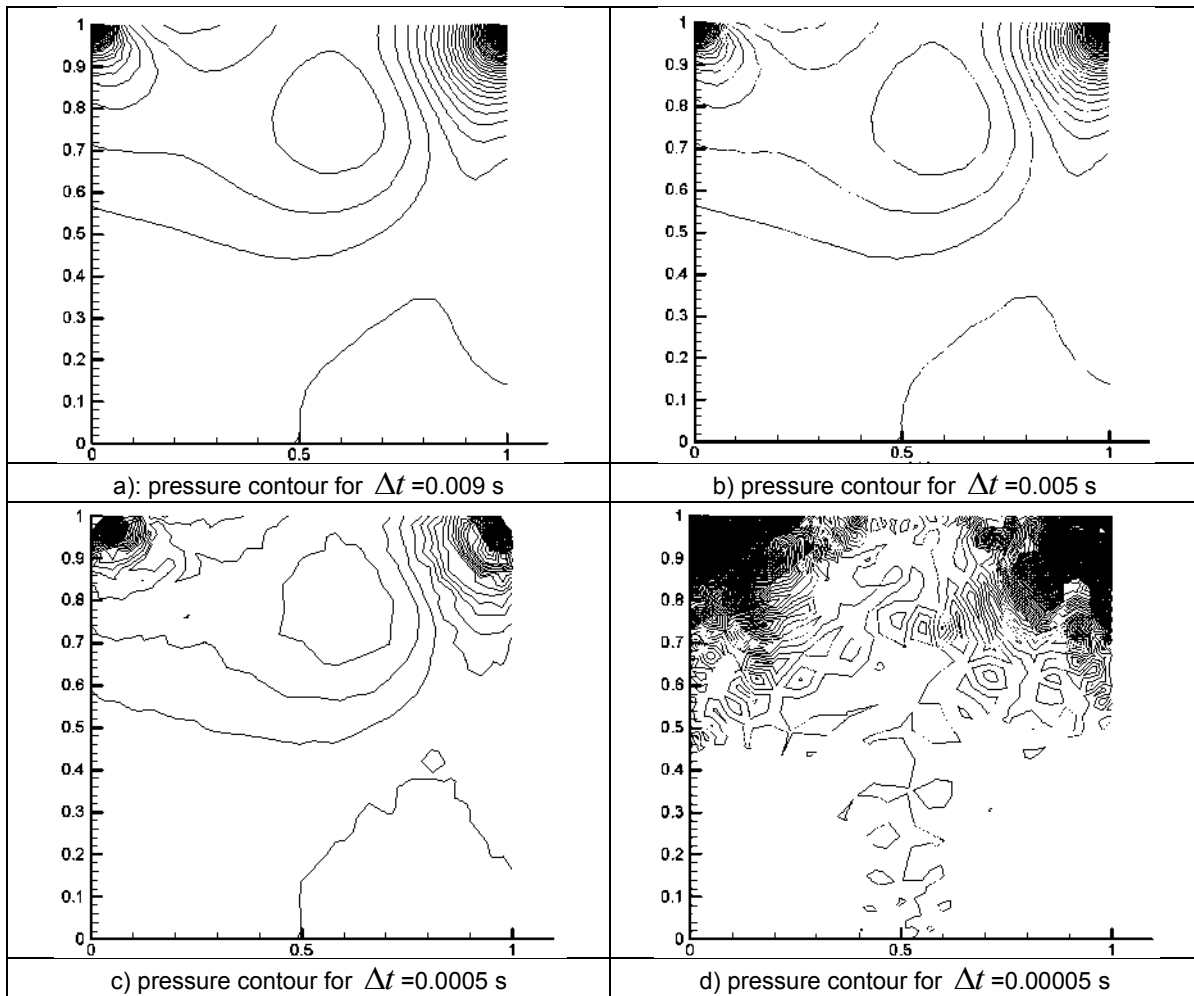

Fig: 8. Mesh with 1392 elements and 778 point

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a): pressure contour for Δt =0.009 s

b) pressure contour for Δt =0.005 s

c) pressure contour for Δt =0.0005 s

d) pressure contour for Δt =0.00005 s

Fig: 9. pressure contour for different time increment size

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Backward Facing Step

The step has a 4.9mm heights, upstream channel has a length of 19.6 mm and a height of 5.2 mm. Length of channel after step is 196 mm. The boundary condition considered is parabolic horizontal velocity profile with a maximum 1.0 cm/s and at the exit the pressure is prescribed. All solid walls are imposed with no-slip conditions. The mesh is used to solve the problem that is illustrated in **[Figure-10]**.
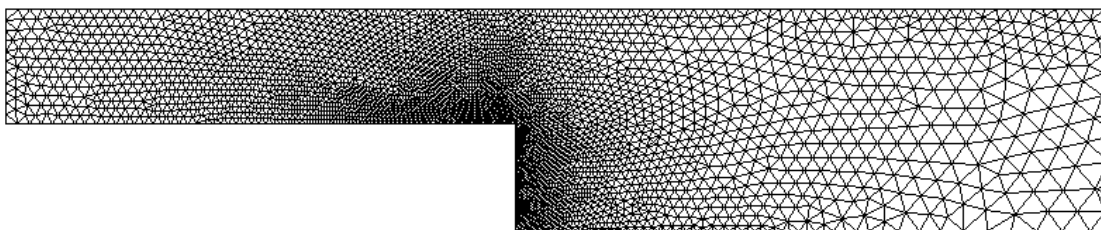

Fig: 10. Mesh used for backward facing step

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A semi implicit scheme with $\theta_1 = \theta_2 = 0.5$ is used here to solve the problem. This problem is solved with Re=100, pressure contours are illustrated in **[Figure-11]** and flow pattern and streamlines are presented in **[Figure-12, 13]**
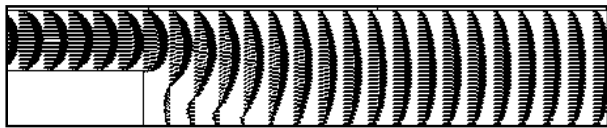

Fig: 11. P contours Re=100

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Fig:12. Flow pattern Re=100

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Fig:13. Streamline Re=100 around the step

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CONCLUSION

Characteristic based split finite element method, CBS-FEM, is presented in this paper for Navier-Stokes equations. In this algorithm three steps in each iteration will be done. In the first step an intermediate velocity is calculated from momentum equations with vanishing pressure terms (partially or fully), using an explicit characteristic Galerkin method. At the second step the intermediate velocities are used to compute pressure or pressure increment. Despite fractional step method this step is applicable for both compressible and incompressible flow problems. And finally in the last step, velocity increments are obtained considering intermediate velocities and pressure terms calculated before.

CBS-FEM is used for the solution of the cavity flow problem and backward facing step problem. The results show good similarity with previous works. Furthermore a sensitivity analysis is done on the time increment size and it is concluded that Δt must be less than a value due to explicit nature in the first step of CBS-FEM, and it must be greater than a value to satisfy the LBB condition, when the same shape functions are used for the velocity and pressure.

CONFLICT OF INTEREST
None

None

FINANCIAL DISCLOSURE

None

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ARTICLE **OPEN ACCESS**

INVESTIGATING THE IMPACT OF ORGANIZATIONAL CULTURE ON EMPLOYEES' PRODUCTIVITY

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ABSTRACT

Aims:Organizational culture is an important factor affecting productivity. Therefore, in this study, the relationship between organizational culture and employee's productivity in the Red Crescent of Brijand has been investigated.***Materials and methods:***The results were analyzed using SPSS software and Smart PLS. The statistical population was Birjand Red Crescent staff and was selected by random sampling .The size and statistical sample included 70 people in January 2013 and questionnaires were distributed among them. In order to collect data two questionnaires - organized culture (Standard Denison Questionnaire) and productivity (standard questionnaire ACHIVE) - were used.***Results:***The results show that there is a significant positive relationship between organized culture and employee's productivity.***Conclusion:***According to the results ultimately in promoting and enhancing the productivity of the organizational culture is very effective. The coefficient of determination is 0.767 percent, which is the appropriate coefficient of determination. As well as all indices of measurement model were approved and the corresponding hypothesis was confirmed.
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INTRODUCTION

The power of culture is determined by its impact on organizational behavior. When the values, norms, and beliefs of an organization are vividly expressed and maintained, and supported by a large number of people, they will be quickly spreading.

Such culture is strong, and the result of a strong culture increasing productivity and reduces the mobility of employees[1]. Organizational culture is one of the essential factors for achieving optimum efficiency. Effective working culture, including the factors that facilitate achieving optimum efficiency in the organization .To enable work culture to deliver optimum efficiency, we should consider it as a part of systematic thinking in labor productivity. The main goal of this research is to answer the question: Does organizational productivity affect employee's productivity in the management of Red Crescent of Birjand? For this purpose, organizational culture on organizational culture questionnaire (Standard Denison Questionnaire) with 4 dimensions and productivity based on standard questionnaire ACHIVE with seven dimensions has been defined to examine the relationship between organizational culture and its dimensions with productivity .The main hypothesis is to show the significance of organizational culture. In line with this hypothesis, sub-hypotheses are followed.
There is a significant relationship between involvements in work with productivity-
There is a significant relationship between consistency and efficiency-
There is a significant relationship between adaptability and efficiency-
There is a significant relationship between mission and efficiency-

RESEARCH LITERATURE

Organizational culture must be considered as a strategic component of the internal environment, inevitable and necessary and appropriate measures [2]. Denison, Leif and Ward (2004) argue that this model of theory describes an organizational culture that is relevant to the organizational performance [3]. Professor Daniel Denison (2000) carried out a research on organizational culture and organizational effectiveness. In his model, the cultural characteristics are as follows:

1- Involvement

2- Consistency
3- Adaptability
4-Mission

Fig: 1.Denison Model
Source: www.denisonculture .com
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Each of these properties is measured by three indicators

1-Engaging in a lot of work (Involvement) involved means there is an element of subjective involvement with the work of this feature is measured by three indicators: empowerment, team-building, development capabilities.

2-Adjustment (Consistency :stability and seamless integration):
Studies have shown that organizations that are most effective are integrated and have stability and behavior of employees is derived from the fundamental values and organizational activities are well coordinated and linked. This feature is considered by three criteria: fundamental values, consensus, coordination, and coherence.

3-Adaptability: Organizations are guided by customers. They risk and mindful of their mistakes and they have the capacity and experience of making changes. They continually improve the organization's ability to value the customers. This feature is evaluated by three criteria: change, customer orientation, organizational learning.
4-Mission: The organizations that do not know where they are and what their existing situation is they often go astray. In this situation, a strong leader will define the vision of an organization   and will create a culture that supports this perspective. This characteristic will be studied by three indicators: trends and strategic direction, goals and objectives, vision Denison, 2000.

Fixed ranges - flexible and internal-external focus

As it is seen in Denison Model, This model consists of two vertical and horizontal axis arrangements dividing the model into four parts) a quadrant .The vertical axis includes the amount and type of focus corporate culture. This axis ends to internal focus on the one hand and leads to an external focus. The horizontal axis refers to the degree of flexibility on one hand to static culture and on the other hand leads to a lean culture [2].

Productivity
Hersey model or ACHIVE model

For maximum effectiveness in assessing and resolving performance issues, managers must determine the causes of problems. ACHIEVE model by Hersey and Goldsmith has been planned to help managers to determine the causes of performance problems and creating change strategies to solve these problems.

Hersey and Goldsmith have chosen seven variables related to effective performance management from among the rest: incentives, capabilities, perceived organizational support, environmental compatibility, and feedback[4].

To develop a model for analyzing human performance, Hersey and Goldsmith had two main goals in mind.

1-Determining the key factors can affect the performance of the individual employee.
2-Providing these factors can be remembered and applied.

1-Ability

In the models, ACHIEVE, the term ability, refers to the knowledge and skills of followers. The ability key components include knowledge relating to task (formal and informal training that will facilitate the completion of a specific task), the experience relevant to the task (the previous work experience that helps the successful completion of homework) and functionality related to the assignment (potential capability or traits that reinforce successful completion). Managers should ask in analysis function: Is this the very person who has the knowledge and skills necessary for successful completion of this task or not?

2- Clarity of role (perceived or imagination of role)

This term is defined to perception and acceptance of know - how of work. To enable followers to have a thorough understanding of the problem, the objectives, and main goals should be clear for them to achieve these goals and objectives (which goals and at what time they are most important [4].

3-Help (organizational support)

The term Help refers to supportive or organizational help, in which the follower needs it to complete his work effectively. Some organizational support factors include funding, equipment, and facilities which are necessary to complete the task, the necessary support by other circles, availability of the product and its quality and adequate human resources.

4-Incentives

The term incentives are defined to motivate followers or the motivation to complete tasks related to a particular successful task analysis. In evaluating the motive we must not forget that motivates many people to complete assignments there are more that intrinsic or outside rewards. Evaluation training and performance feedback.

5-Evaluation

is defined to casual daily feedback performance. The process of continuous feedback allows followers to be aware of how we work. If people are not aware of their performance problems, improving the performance is expected unrealistic. Before the official assessment, they must be informed of the results of informal assessments regularly. The cause of many performance problems seems to be a lack of necessary training and performance feedback.

6- Validity /Feedback

Validity is applied to the appropriateness and validity of legal decisions regarding human resources. Managers must ensure that decisions taken by the people should be appropriate in terms of legal, court and corporate policy.

7-Environment (environmental relevance)

The term environment refers to those external factors that can affect the performance despite the ability, clarity, support and motivation for the job. The key elements of environmental factors include: competition, changing market conditions, governmental regulations, logistics and such these things... [4].

Denison organizational culture communication and productivity:

Organizational culture can be used as a powerful lever to guide and strengthen organizational behavior [5].

1. Involvement at work and productivity

This concept has not entered into organizational issues more than two decades.

The staffs involved at work are usually energetic and active and they interact positively with their work and try to effectively fulfill their jobs. The results indicate that employee involvement at work can have a significant impact on the profitability and productivity of organizations. The writings and research in this area indicate that involvement of employees at work is under the influence of various personal, occupational and organizational factors. One of the most important organizational factors that may affect the involvement of work is the amount of employees' perception of fairness in the working environment.

This occurs in the context of social exchange theory, in the theory of social exchange the relationships between employees with their leaders in organizations is a transaction in accordance with a psychological contract. When organizations meet the expectations of their employees, the employees of the organizations will also meet the expectations of the organization. Among the important expectations of employees from their leaders, is the fair conduct towards them.

Employees would like their leaders to treat them with fairness and impartiality. In this case, they will also try to be fair and they will try to be fair in their organizations and involve themselves more and will leave a higher yield[6].

2 - Consistency and productivity

One of the most striking characteristics of the present era is the dramatic and continuous change, which occurs in all phenomena. Consequently, the success of today's organizations is an adaption to changes in the external environment and without the change in the staff and their capabilities it will not be possible.

-organizational adaptability

It includes the environmental imposed demands on the activities of the organization.

Overall, three dimensions of adaptability affect the effectiveness and efficiency of the organization and include:

1-The ability to understand and respond to the external environment
2-The ability to respond to customers
3-The ability to rebuild and re-establishing a set of behaviors and procedures that allow organizations to adapt.

These changes are beneficial, but a successful organizational change towards greater compliance is along with the demand, requires a change in the capabilities of the organization staff [7].

Adaptability and productivity

They are other factors relating to the coordination of work, occupational adjustment. Satisfaction is the stimulating of healing behavior and regeneration and dissatisfaction is a drive of consistent behavior. In some cases, the mismatch between the needs of a person is significant environmental and person will be forced to go through an adjustment. Job Adjustment is an important factor to continue successful employment.

Everyone expects to provide employment, health and credit for individuals and meet his basic needs.

Many definitions have been provided in the field of occupational compromise, a compromise can be considered as a set of occupational composition and psychological and non-psychological factors. Job adjustment theory is based on the concept of the relationship between the individual and the environment. Job adjustment theory considers work more than a step by step task-oriented process.

Labor involves human interaction and is the source of satisfaction, reward, stress and many other psychological variables. The basic premise of this theory is that the person wants to achieve and maintain a positive relationship with a work environment. According to Davis and Luff Kist, people enter their needs into the workplace, and the environment also claims of the individual. In order to survive the individual and the environment both must reach to some degree of coordination.

Two key elements in this theory are the environment structure and adaptation of the work. Work adaptation is at its best time when the environment and individual could coordinate business requirements with work skills. Changes could also cause satisfaction. Employees' efforts to improve the coordination of their work environment can be considered as measures to achieve work consistency. Usually, compatibility is obtained for one of two following modes: action and reaction. In practice, staff attempts to alter the work environment, while in a reactive mode they try to adapt themselves better with the environment [8].

Mission Culture and productivity

The mission is a brief statement expressing the type of mission, purpose, and reason for its existence and the values that the organization is bound to it. In fact, it is according to the goals and tasks of the mission and activities of an organization is formed and developed [9]. Inset of organization's activities. Defining the organization's mission, Fisher determining long direction. Also, Melba Wang and Fang have stated the mission of an organization: are objectives, definitions, and concepts of organizations that are achieved by defining external goals and the organization's social role. Primarily in organizations that have a strong organizational mission, people with a clear understanding of the mission of the organization, will be able to image a desirable future of the current behavior of the organization and lead the organization closer to our goals.

The lack of strong and clear organizational mission will cause confusion of the people in a way that common goals for employees will not be clear, meaningful and stimulating. Finally, many problems will create in access to goals[10].

MATERIALS AND METHODS

Methods 1- Involvement 2- Consistency 3- Adaptability 4-Mission

This study is of applied type and in terms of method is a descriptive field. The statistical population consisted of all employees between January and February 2013 among which a questionnaire was distributed. The organizational culture variable has been established of four components - 1- Involvement 2- Consistency 3- Adaptability 4-Mission-.

Inventory productivity Hersey and Goldsmith (1980) is known as Achieve. Software Spss, Pls was used for statistical analysis.

In this study, the sample size is calculated using Cochran formula and have been met which contains 60 of which are intended volume 40 people.

Evaluation of model Measurement

Exterior investigation of the model includes load index research, the reliability, and validity of the exterior model

1-Load index or questionnaire
The[Table -1]and graph below, the factor loading coefficients the questions are more than 0.4 that confirms the acceptability of variance indices with its associated structures and highlights the appropriateness of these criteria.

Table: 1. Load factor questionnaire

Structure		Number of Questions	Load factor
Average of engaging culture/- Involvement		Question 1 to Question 15	0.557
Average of compatibility culture/ Consistency		Question16 to Question 30	0.875
Average of culture of adaptability		Question31 to Question45	0.907
Average of culture of mission		Question46 to Question60	0.613
productivity with the factor analysis on two factors Categorized	Average of Help Clarify understanding, Ability	Question 1 to 3 the ability ,questions 4 to 7 to understand the job, questions 8 to 11 to institutional support	0.894
		Questions 8 to 11 organizational support, questions 12 to 15 motivation and question 16 to 19 feedbacks, questions 20 to 26 refers to credit.	0.933
	Average of Environmental compromise، Incentive، Evaluation and Validity		

To investigate the reliability of exterior model the standard composite reliability and Cornbrach's alpha is used.

Table: 2.Measurement model

Change	Number of Questions	Cornbrach's alpha	Reliability Tools	Average Variance Extracted(AVE
productivity	60	0.805	0.910	0.835
Culture	12	0.746	0.8358	0.566

[Figure–2] shows the path coefficients of the loads
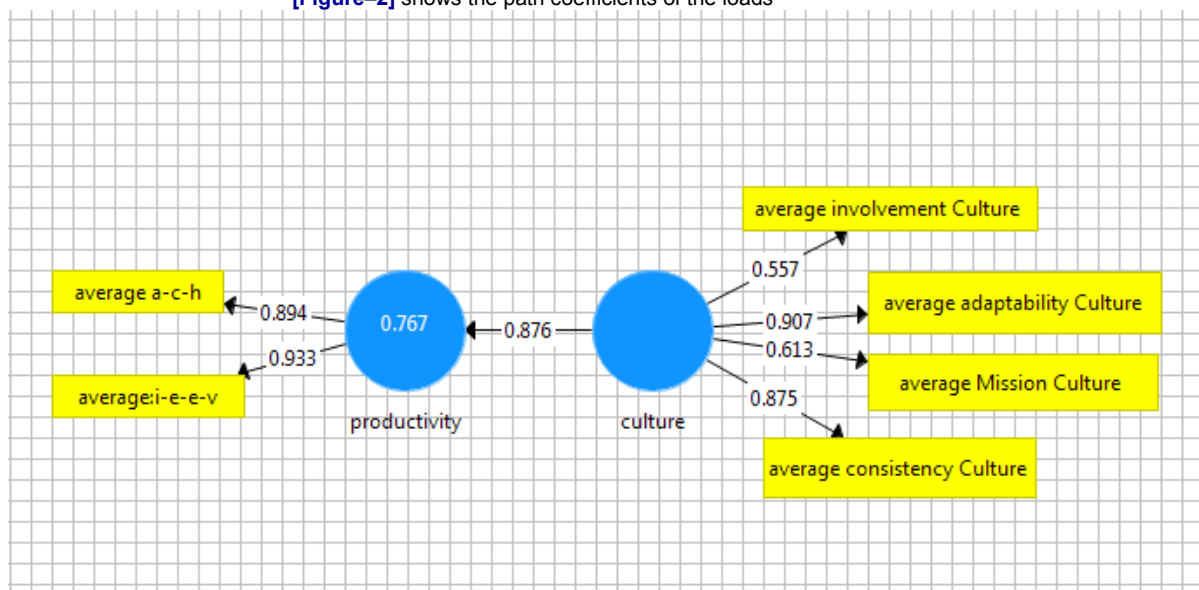
Fig :2. factor and the factor loadings
………………………………………………………………………………………………..

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Fornell and Larcker, method

This metric represents the relationship between structures with its indices in comparison with its relationship with other structures. According to this method, when divergent validity is at an acceptable level the variance of the AVE is greater than for each construct and other communal structures and other structures (the square of the correlation coefficient between structures). This model will be carried out through a matrix and in a case of divergent validity is accepted the numbers in the diagonal of the underlying values is higher.

Table: 3. Fornell and Larcker

productivity	culture	
	0.914	culture
0.876	0.754	productivity

Exterior model:

This section examines the hypothesis generated. To check the structural model the significant coefficients Z and the coefficient of determination has been used.

1. T-value significant coefficients

T model structure using coefficients is that these factors must be greater than 1.96 to approve confidence level 0.95. T amount just shows the true relationship and intense relationship cannot be measured **[Figure–3]**.

2. The coefficient of determination (R Square) R2

According to 0.767 the coefficient of determination is at an acceptable level.

The survey of research hypotheses
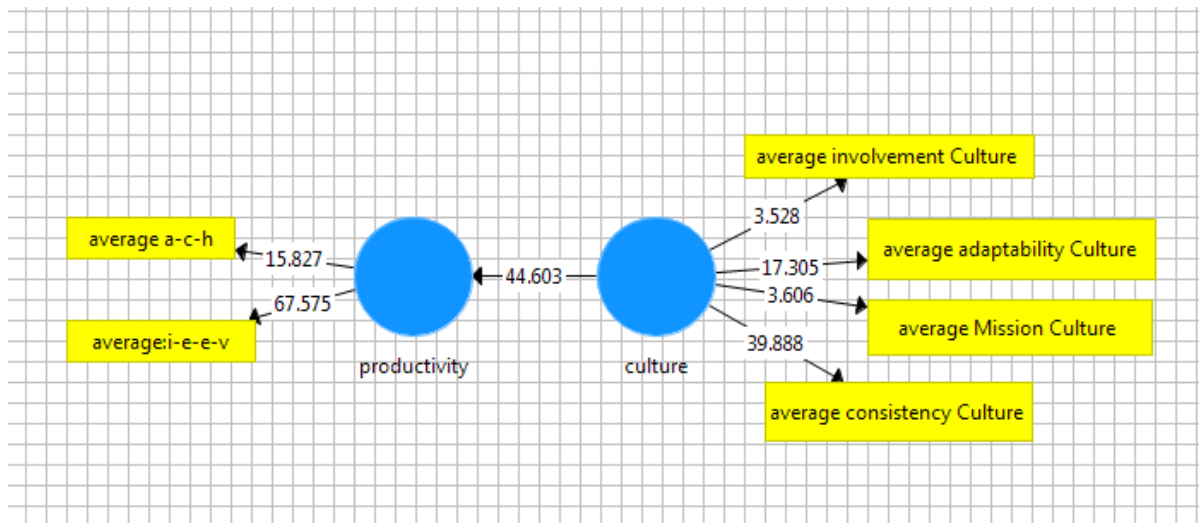
Fig: 3. Structural equation modeling analyzed and statistic T

………………………………………………………………………………………………………..

Since the statistic, T is higher than 1.96 .Accordingly, all paths were significant. Based on the **[Figure– 3]** summarized information in **[Table–4]** .(Primary and secondary hypotheses are confirmed.

Table: 4. Summary of results of hypothesis testing on partial least squares method

Research hypotheses		Path coefficient	T-statistic	The coefficient of determination	Hypothesis test result (p <0.05)
The Culture of mission affects the productivity	Organizational	0.876	44.603	0.767	Confirmed

Compatibility culture affects productivity.				
Adaptability culture affects productivity.				
Culture of involvement affects productivity				

RESULTS

The results show that there is a significant positive relationship between organized culture and employee's productivity. Organizational culture is considered as a factor in productivity and performance in the organization, so if work culture is well spread among management and employees, organizational commitments and moralities will increase. Thus, a better performance and greater efficiency will be made.

In order to eliminate the weaknesses and strengths points in organizational culture   to increase productivity performance of employees, according to a survey conducted in this study, the following suggestions are offered:
The culture of an organization's culture affects society and culture is transferred on the arrival of newcomers. Therefore, necessary training is in the social ability direction.
To demystify the job, employees must explicit their work objectives and their behaviors and meet the management expectations.

Participation of employees should be paid attention .It is a suitable means to encourage employees participation and their performance. In order to establish better cooperative system simple systems such as the suggestions should be used.

According to ACHIEVE model, knowledge and ability of supervisors, specialists and managers should be promoted and those who spend all stages of formal and informal education should granted special privileges so that they are motivated. Leaders must present support and credibility and organizational environment for creative ideas and issues should be openly expressed to prevent poor staff morale. This will cause the trust of managers and productivity.

With regard to corporate culture, the easiest way of dealing with culture is the change in the norms Desirable organizational culture plays the most critical role. So managers should be patterns. They should motivate among thousands of people   and be a role model for their followers. This requires an organizational commitment to their values and beliefs.

CONCLUSION

 According to the results ultimately in promoting and enhancing the productivity of the organizational culture is very effective. The coefficient of determination is 0.767 percent, which is the appropriate coefficient of determination. As well as all indices of measurement model were approved and the corresponding hypothesis was confirmed.

CONFLICT OF INTEREST
The author declares having no competing interests

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MANAGEMENT

ARTICLE   **OPEN ACCESS**

QUICK SEISMICALLY DIAGNOSIS OF IRANIAN HISTORIC BRICK BUILDINGS, THE ESSENTIAL SUSTAINABILITY STUDY; BY FOCUSED ON THE SADOSSALTANEH HISTORIC BUILDINGS COLLECTION OF QAZVIN

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ABSTRACT

Accurate and reliable assessment to determine the seismic vulnerability of Iranian historic brick buildings can be a costly, lengthy operation and would be requires special equipment. Therefore, the ability to accelerate Iranian seismic vulnerability of architectural heritage is very important and timely decisions while preserving will be design, or at maintenance, strengthening, restoration and retrofitting of these buildings. This study explains the proper procedure on how to speed up the seismic vulnerability of monuments based on historical collection of brick buildings of Qazvin Sadossaltaneh; belonging to the Qajar period of history has done. This study utilizes the expertise Methods and local examination Iranian and International codes that are valid for qualitative and quantitative assessments of the required technical standards and regulations in the comment are relevant engineering. The results of this study are the classification of cases of major damage in the historic brick buildings; identify the destructive effect of the failure to explain the development process, treatment and methods of proportional strengthening to the damage cases of emergency. The main result of this research also identified of damage of brick buildings collection against of ability rate of the historic seismic vulnerability of these buildings. This study shows that although the geometric shapes and the relative of the walls in the historic brick structures in against earthquakes, potential and ability for seismic response is calculated according to provides; but due to lack of integration of technical components, the material weakness and lack of integrity in structural connections, seismic strengthening of the historic brick buildings is a problem and collection of this historic buildings will require seismic retrofitting. Finally, the basic criterion for evaluating the seismic vulnerability historic buildings to be observing the regulating criteria; is identify the ability rate of materials used in components and connections joints a historic structure.

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INTRODUCTION

Comprehensive assessment of the risk to be monuments of engineering materials characterization, position and shape of the use of these materials, the structure of the buildings studied. The perimeter of the building can be helpful in determining risk historic structures. Therefore, studies to assess the stability, reliability and sustainability traditional materials used in monuments in dealing with the destructive agents of chemical, physical, mechanical and biological significance will be extraordinary.

In this regard, the performance evaluation of mechanical destructive on dynamic detection of seismic vulnerability of historic buildings due to the possibility of irrecoverable injury and human and financial losses due to the high value of historic buildings in the earthquake's destructive potential is important. Seismic vulnerability assessment and identify the strengths and capabilities of other monuments in Qazvin region with very high risk is the most important thing necessary for the provision of protection and maintenance of important architectural heritage, as the historic Sadossaltaneh collection.

In the other hand, the intervention of the seismic rehabilitation of historic buildings requires a detailed documentation, principled, rapidly and without any destruction or change in current status of monuments. Of course this matter is difficult to assess and analyze the problems faced by them. In addition, the application of visual and rapidly inspection to help normal traditional equipment causing uncertainty in the accuracy of the identification of weak components and materials used in the building by technical aspects of the specification are together with the lack of accurate diagnosis and correct positions the cracks and the risk of cracking of the structures within the

structural elements of monuments. So in this way, adequate assurance in the pathology even after the intervention of seismic performance and seismic rehabilitation of historic structures would not be achieved.

The use of non-destructive evaluation equipment and no contact surveying of seismic wave surveying temperature surveying data obtained from layer to complete the surveyingand ensure the desired approximate analytical models in the initial stages of determining the seismic response of the monuments at the site for the buildings necessary to deal with earthquakes actions. Therefore, in the absence of sufficient time and lack of proper equipment, the specific intervention plans, it can be rapidly way to evaluate visual and valid standard codes applications easily with quickly enough goals to be achieved.

The process of pathology and develop conservation plans

The process of pathological and destructive environmental and human factors in historic buildings it can be said, however, acting on the basis of theoretical principles policies, basical and focused executive management can be effective; but the maintenance and upgrading such buildings should pay attention to the environment and the up-to-date demands of social isolation developed. The general formulation of detailed plan explaining the historical context of the original structure and prioritize the valuation of the plan Building retrofitting and rehabilitation of existing buildings is necessary to prioritize. So in the pathology studies and reviews on existing historic buildings, identification of materials, mortars, structural system, construction technology, and restoration in accordance with the environmental conditions and needs of day are important [1]. If the management is evaluating and developing an outline and detail preservation, maintenance, consolidation, strengthening and retrofitting of historic buildings; the main factors that determine the structure of the system is affected by neurological or genetic pattern to be used, prevented waste of energy and rework, repair operations can be improved [2]. Thus the use of intelligent assessment system that can simultaneously detect defects and structural defects, probable causes and repair methods appropriate to the announcement, the process will be more effective [3]. On the other hand, to investigate the possibility of restoration of historic buildings, but they need to maintain the status quo, at first of all; it should be enough to cause damage done. Because restoring monuments to their previous status in some cases can cause their collapse and failure is intensified. Also important structural issues such as the unwanted buckling and dangerous (P-Δ) deformation to its worn monuments had not been released [4].

Thus, in line with sustainable development, monuments need to maintain and deliver to the next generation and to preserve the cultural identity of technical specialists must comply with environmental protection of historic monuments of enduring utilizes [5]. Environmental considerations also play the role in the destruction of historical monuments acid rain due to atmospheric pollutants such as sulfur dioxide, nitrogen and carbon are worthy to study. These pollutants are cause of paint timber, metal corrosion, loose stone and lime mortar historical monuments [6]. In relation to the determination method of the need for retrofitting of historical monuments, considering the wear and tear and mechanical weakness existence of historical monuments structural elements; Retrofitting is not the only deciding factor in the history of well tolerated and of historical monuments should have to deal with severe destructive earthquakes. Historic building materials can not only be done to improve the technical quality of seismic damage and prevent future seismic and analysis of the historical monuments is an essential objective [7].

Analysis of the historic buildings and destructive factors

In thermal expansion behavior and failure analysis of structural elements of the historic brick buildings, by finite element methods for the detection and display of cracking and the ability to track the damage and determine the cause of the collapse of the development process as well as numerical methods can be used [8]. Of course pathology of the damage to historic buildings should be based on assessment criteria for fatigue, creep and control elements of historic structures under long-term loading and fatigue cyclic loading part of poses done [9]. Therefore the modeling and analysis of mechanical behavior of historic brick buildings under long-term static cyclic loading and fatigue causes by tension turn up will be necessary [10]. Seismic vulnerability of historic brick buildings should also performance analysis as nonlinear seismic methods of historical structures, under the effect of external load destructive pages and the page with horizontal and diagonal cutting performance shearing to take place [11]. The nonlinear dynamic analysis of historic brick buildings were also found to be the best model for seismic evaluation of the mechanical behavior of these buildings is a material breaking the brittle evaluation. Because of the nonlinear structures under the external loading on this surfaces destructive influence of breaking brittle and tough to show weakness existence of [12]. Evaluation of shear behavior of historic brick walls of the

interior surfaces cyclic loading, with the ability to determine the diagonal represent a large cracking is worthy to retrofitting of [13]. However, according to traditional methods of evaluating seismic creative historic brick buildings, pay attention to the historic structure, the combination of structural walls and roofing components packaging, domes and minarets elements of the importance of internal and external style surfaces loaded at the junction elements of historic structures is clearly evident. However, the flexibility of the materials used in the historic structures, solid content (the absence of large openings) and wall thickness of the structure represents a historic brick buildings are seismic affordable [14].

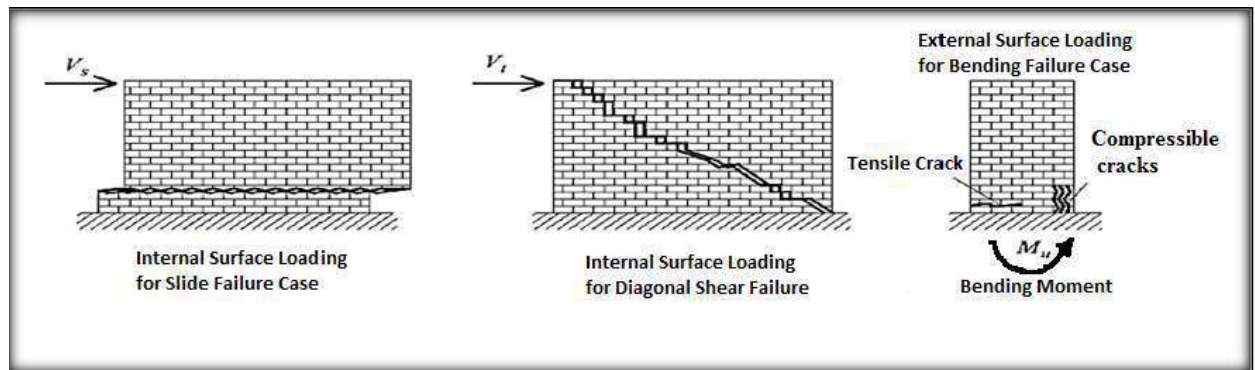In relation to the failure of historic brick walls can be as follows**[Figure-1]** be noted below:

Fig:1. Diagram of the failure patterns by loadings on brick walls inside and outside of surfaces
…….

The consolidation planning scheme, strengthening and retrofitting:

Potential damage from frost to ease based on porosity, permeability and water absorption may be determined in structural materials of monuments, therefore, the probability of frost of rainfall on ground is the next problem should be studied porosity [15]. The porosity of the mortar used in the components of the historic monuments of clay, gypsum, lime with gravel and sand are mixed; could be the most important factor in determining the ability of destruction and retrofitting plan that is to be developed [16].

Lime gypsum mortars in terms of durability and sustainability for the restoration of monuments has been very successful [17]. Therefore, the use of mortars containing lime or limestone grout injection of resin that has the raw materials of monuments with sufficient homogeneity, due to the porous nature of lowering of monuments old mortars; these mortars in the design of these retrofitting can be utilized [18].

 Organic additives plant or animal use in the traditional techniques, these mortars in the technology of monuments restoration is as well as to prevent the corrosive water penetration [19]. The normal practice is to reduce the amount techniques, these mortars carbonation pores are set in these mortars to 0.03 micrometer pore size limit [20]. So use of containing additives waterproof for restoration of historic brick buildings very useful and the appearance of items such as small micro cracks bumps and spines in the building to prevent the destruction [21].
The other hand containing pozzolan against atmospheric pollution and marine waters are corrosive resistance and good durability and even in the heating of the sun are also very resistant and sustainable [22].

Durable components and materials in the field of historic brick buildings (the brick) can also be said that there is the impurity; especially uncontrolled baking temperature of the bricks in the durability is very effective. In Contrary to the observations as follow **[Figure- 2]**if the bricks between 1000-800 °C baking temperature is adhered, low porosity and pore size of the bricks and well resistance over many years and have good sustainability [23].

ARCHITECTURE

Fig: 2. Show the weakness of Components of the brick and mortars brick wallsof the historical influence of long-term deterioration

According to conventional seismic rehabilitation of the of the historical brick buildings by cause of brick walls weakness due to the structural elements of the dynamic performance of the earthquake; Mainly to strengthen the walls and provide a hard double diaphragm or adding shear walls or the use of seismic energy dumpers and use of materials and structural show the weakness of Components of slimy among historical monuments acting [24].

Plan needs to decide on intervention

Develop a plan for the protection, maintenance, consolidation and retrofitting the performance of seismic Strengthening of historical monuments of Sadossaltaneh collection, at first of all we need; goals, philosophy and the design requirements specified by the employer. In other words, based on the level of performance required by the employer duties measures will be necessary in order to plan. Therefore, according to the prediction of earthquakes of intensity (low to very destructive) with a return period of 10 years, 475 years and 2475 years, the seismic performance of desirable for employer in historic monuments in five levels or functional aspect of the retrofitting plan can be developed and implemented in stages:

5-1- Meters exploitation capabilities without interruption and without any financial deterioration or damage
5-2- Availability in mind the risk of local failure or limited of the historical structures
5-3- Availability only in terms of ensuring of life safety to the people present at there
5-4- Availability in terms of the probability of reaching the verge of fast collapse and destruction of the historical structures
5-5- Availability of urgency in certain situations likely to be unstable and collapse stage of monument structures
So in this case to determine the technical condition of the existing buildings with desired conditions Technical Engineering assessment should be done in two directions as follows:
a)   The need to provide structural stiffness in dealing with the destructive earthquake and with no cracking
b)   The need to provide structural strength in dealing with the destructive earthquake and flexibility
So in the above technical studies and structural analysis of the structural members and structures of historical monuments, in the field of stationary (static) and dynamism (dynamic), the dual linear or non-linear states under favorable views of the employer could be done [25].

Then determining the limit of need for intervention in Strengthening and retrofitting of the historic brick buildings have special importance. In other words, it should be noted that the extent of intervention of the buildings of collection. On the other, the act must be appropriate for earthquake Strengthening and empowering potential as a percentage of acceptable failures and the grouping of the expected failures prioritize the destruction and renovation of historical of will be given for each structure of historical collection. For example, because of historical monuments mainly set of in four porches and the floors are not a lot, creating the risk of earthquake damage for visitors high to escape the building small (Because all people have access to the facilities at any location in the central courtyard). So determine aspect in developing performance level of retrofitting plan set of the historic brick buildings Sadossaltaneh collection acting According to rows (5-4) above, namely: availability in terms of the probability of reaching the verge of collapse and failures the historic structures fast, the best suitable, most economical and most executive stage in determining the level of performance expected from the historic set of historic structures will be considered.

Technical Regulations and Guidelines or valid codes

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Among the set of or valid codes regulations and guidelines on the evaluation and analysis of the seismic performance of historical monuments in Iran and more particularly described as follows of Qazvin Sadossaltaneh collection of historical monuments are worthy of presentation:

6-1- Regulations 2800 for earthquake in the design standard buildings (buildings, regular up to a maximum of 50 meters or irregular up to 18 meters in height)

6-2- Seismic of retrofitting of technical publications and guidelines issued by the Management and Planning Organization formerly (the vice president of strategic monitoring) number of publications: 251, 345, 360, 361, 363, 364, 371, 376 and the 390 necessity guidance, interpretation and description of service

6-3- Regulations and international standards as: ASCE and FEMA and CHBC and UCBC

6-4- The instructions in vulnerability analysis and seismic rehabilitation of existing buildings Building unreinforced and compile and promotion of national regulations issued by the office of the Department of Housing and Urban Development

6-5- Section VIII of the National Building Regulations the Building Design and Construction of Buildings issued by the Office of the National Building Regulations

It should be noted that presentation set of regulations have been published over the past decade largely formulated in their content than the dignity and civility. Most importantly, the regulation in accordance the specific of requirements for seismic rehabilitation of historical monuments in Iran worthy the formulation is not over.

Globally, the regulations for the protection of historical buildings in California CHBC published in America in 2007; seismic vulnerability analysis of historical monuments to Building Regulations, the regulations on the Protection of buildings of collection unreinforced standard UCBC, has been postponed.

Therefore, as our evaluation, can be specifically designed according to the 2800 for earthquake Iranian standard buildings [26] and rapid assessment guidelines [27] the masonry and building of retrofitting regulation for unreinforced [28] (Publication No. 364 and 376 vice president of strategic planning and monitoring) the historic brick buildings of collection set of Sadossaltaneh collection in Qazvin and pathology would be evaluated.

The process of seismic retrofitting plan in design category

These categories include five sections, identification, pathology, performance analysis, develop conservation plans and interventions for the treatment of the seismic weakness. Seismic pathology department for historic structures collection of both qualitative and quantitative measures must be principled. In other words, after the initial assessment of the relevant of historical monuments and determine the priorities and objectives identified in the seismic performance level desired, the technical characteristics of these the historic buildings, as well as geophysical and geotechnical properties of context of the site recognition of these buildings will apply. The seismic vulnerability assessment of seismic rehabilitation of buildings of collection based on the objectives and performance level defined and also select appropriate strategies, develop maintenance plans, seismic Strengthening and of retrofitting plan of will be used.

In other words, due to economic considerations, political and social as well as proposed solutions and executive stage facilities and specific terms of each monument; executive stage interventions related to the maintenance, conservation, monitoring and continuous assessment of the failure process and the phased executive stages, much of the consolidation, seismic Strengthening and retrofitting the buildings will be developed to execute on.

The analysis of the seismic performance of each of the Show the weakness of elements of set of the historic structure should be considered as separate from one another. In other words, given the destructive effects of natural factors such as light, heat, cold, wind, water, moisture, freezing and apply knowledge of mathematics and geometry, physics, chemistry, mechanics and strength of materials, skills and capabilities of the performers and practices and methods and the production of conventional materials and the elegant historic buildings and of historical monuments, including the specification of structural elements following; foundation, walls, arches, domes, minarets, or are stairways separately.

This means that the development plan for the seismic rehabilitation of historical monuments set of Sadossaltaneh collection cannot rely on exclusively building engineering. It should form a formidable engineering task force and the artistry in science and engineering motivated the philosophical vision of preservation and authenticity of limit of need for a sense of duty towards the preservation of historical monuments includes all fields of architecture,

structure, mechanic and electric, construction of buildings and landscaping execution, interventionist activities, designed and implemented.

So to summarize qualitative and quantitative pathology of historical monuments as the following could form the seismic rehabilitation plan will be effective:

7-1- qualitative pathology objects: including inspection and engineering data collection, preparation of technical documentation for site of buildings and properties, initial assessment of the status quo in terms of geometry, structure and neighborhood, previous interventions, laws and regulations and technical considerations executive stages and specific tests are needed determine type and quality of reporting vulnerabilities the general considerations and determine necessary to carry out the next phase. (for quantitative pathology)
7-2- quantitative pathology objects : including determine the seismic site and Liquefaction of mental capacity, consolidation, define and determine intensity of earthquake acceleration performance level during the earthquake, providing site-specific acceleration range, determine detailed information of the seismic vulnerability of historic buildings, maps as built and complete technical documentation related to the monument, mechanical determination of properties of materials and Show the weakness of elements of the historic structures and stiffness determine capacity and deformability are performed detailed studies of the seismic behavior of the members as quantities' objects help modeling structure, load carried by the possibility and determining the amount of inner stress of members and deformation likely to report quantitative vulnerability in the case of joints and seismic rehabilitation of vulnerable members qualified for the interaction site and historic buildings in the case for earthquake [27].

Theoretical Basis and technical engineering requirements of retrofitting plan

In recognition of the current status of seismic performance of their monuments and in dealing with the destructive earthquake Technical Engineering relevant to the goals and expectations must be from qualitative and quantitative aspects of seismic vulnerability detection and the system of building structure How it works in the event a structural disaster, we have enough information. In particular, the map modifications, floor modifications, modifications and additions in the facade decorations, resistance changes, modifications material hardness materials, modifications made to the structural and non-structural components And also technical and constructive errors and mistakes of the previous executive stages, must be specified.

Then improvement of retrofitting plan with respect to the formulation of appropriate design, low weight materials to high strength material , good speed of the executive operations, no need for heavy equipment, parts ease of installation cutting preparation, sufficient resistance to corrosion weathering, a good formability , reliable pre stressing before and after the operation,Sufficient compatibility with previous the historic of mechanical structural materials, sufficient to justify the economic conditions, ability to maintain stiffness, strength integrity in the joint with right to respond in accordance the terms seismic to pay [29].

The rules in force in historic buildings set of Sadossaltaneh collection

Although the major of historical monuments of the general aspects of traditional architecture with its strong fundamentals to witness the historical stability and against pests environmental disasters, particularly earthquakes has local horrific have survived, But the identification of the seismic capacity of historical monuments such as the conventional masonry building, before any interventions falling awkwardly valuable architectural originality; procedural rules should be controlled. If the of the deterioration of materials system of structure should to eliminate the creep acceptable failures of the action. Accordance with the paragraph (8-2) issue VIII of national regulations required for the overhaul of buildings all of the administrative and technical procedures in the whole of country (especially brick buildings without tie packaging) must be specialized the site in flood, for earthquake ground liquescence, large consolidating, falling rocks, landslides were safe and reliable operation of existing materials to be been detected. Also length is twice the maximum width of the building. The maximum size is limited to 25 meters. The building is almost symmetrical with respect to both its major axis. Be sure to continue on the foundation seam separation is required. The maximum of building height of each floor is three meters. Holder at each edge should not be more than one-fifth of that edge. Structural integrity of in the joint would be well established. The building would not be built on sloping ground. The width of the foundations must be one and a half time due the width of walls rely upon them. Foundations must be made by lime quality as concrete base on the lime mortar by grade of at least 350 kilograms per cubic. Seats on the following packaging at least 30 cm

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above the floor is finished done with adequate moisture insulation. The structural walls packaging stiffeners must be in maximum distance of 5 meters. The minimum width of the building of 35 cm walls at least one-tenth of would not be height of the wall. The wall opening up area level third area level would not be structural walls. More importantly; packaging the flat or sloping or curved roofs must be enclosed the tie horizontal packaging. The minimum height of the arch or arches rise into the middle third of the diameter by radius must be in the lateral openings. The maximum height of the chimney would be one and half meters above the top level of the roof. Facade decoration would be associated with the structural system. Asphalt Shingles moisture insulation out of the wet ceiling roof must be principles and technical direction of the slope with the sufficient overlap [30].

The essential of seismic buildings pathology set of the historic Sadossaltaneh collection

The considerable for the set of in accordance Sadossaltaneh historic buildings collection are above regulations as follows;

10-1- necessity of preserving architectural heritage authenticity of the valuable set of historic Sadossaltaneh collection the historic to transfer the wealth to the next generation

10-2- considering on geotechnical and geophysical characteristics of context of the site, determine possibility falling objects and debris capturing risks related to the neighborhood of the buildings

10-3- continuity of structural members, the weakness of elements , the rate of oldness in existing materials between components, broke ability the brittle elastic mechanical behavior, the degree of gravity, inertial motion of the historic structures

10-4- status presence of underground water, water effects, descending, ascending penetrating moisture from inside or outside the body of historic structures

10-5- option to keep maintenance, conservation or seismic Strengthening and retrofitting the historic structure while maintaining the form, original shape materials the historic authenticity of the historic structure

10-6- considering on the failure modes failure process structural members, the weakness of brick elements of historical monuments (unreinforced without tie packaging) severe to in site-specific earthquake

10-7- gain sufficient knowledge of the properties of shear cracks in horizontal or vertical compressive or tensile cracks in the plane diagonal horizontal cracks or bending cross outside surface

10-8- pay attention to the cracks of the horizontal torsion asymmetric buildings And also horizontal existing cracks in the roof, the roof and Holder unusual horizontal sliding roofs edge

10-9- accuracy about the cracks and bumps caused by and deformation caused by the driven arched roofs or dome without having to tie horizontal packaging

10-10- considering about of the placed openings severe to in the walls of the structural members, distribution of pore in structural wall members of historical monuments

10-11- sufficient attention into the structural wall members, separation severe to in longitudinal and cross axes and assessment of compliance in a maximum length of 25 meters to separate the structural wall members for integrity of unreinforced buildings (unreinforced with ties)

10-12- careful review of of interventions to performed before the effect of modifications severe to in geometrical, physical, chemical, mechanical effects resulting particularly severe to in seismic performance and the bearing capacity of relevant

In final statement and a brief description: inspect the damage to the health and empowerment system of structure of historical monuments should be done as a whole. It means that the destructive effect of destructive environmental factors cannot afford to tolerate the effects of these factors severe to in materials and the weakness of brick elements system of structure, for preserving the authenticity of has the raw historic structures before and after the implementation of the seismic rehabilitation should be considered.

RESULTS

By reviewing the presentations in the form of excerpts and highlights can be said According to the evaluation table of contents [Table- 1]although aspects of the geometry form the relative supply of the historic structural relative ratio percent (Gahremany yard and Negarossltaneh yard) severe to in earthquake, the good talent capacity to respond the expected seismic calculation is according to, but some basic technical and constructive problem were occurred, diagnosis of historic buildings such as the seismic stability, doubt that they should be analyzed in more detail.

Of course, these causes would take in the images on the table [Figure- 3]that have been classified:

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Table: 1. Quantitative evaluation status by geometric structural relative ratio percent valuable set of historic Sadossaltaneh collection. (in 2800 seismic design code)

The minimum required percentage	The relative percentage of lateral wall	The relative percentage of longitudinal wall	Name and Situation Of the Building	row
4%	15.7%	17.7%	Gahremany yard	1
6%	18.1%	22.1%	Negarossltaneh yard	2

The assessments made accordance with by the Local in Views Pictures presented in the table below at images [Figure- 3]with the classification of the by geometric evaluation, vulnerability assessment, evaluation of the destructive environmental factors and ultimately the destructive incremental unwanted deformation on structural stage has provided:

status openings wall height and geometric proportions			1
status deterioration of severe to in bricks mortars in structural buildings members			2
effect of precipitation Water penetration up and down of the buildings			3

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Fig: 3.The pictures of the destruction of the buildings seismic instability factors of the buildings in set of historic Sadossaltaneh collection

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11-1- walls of buildings of historic Collection In Contrary regulations or valid codes points surveyed, more than three meters high therefore need packaging horizontal.

11-2- structural walls that mentioned have openings with more than a third of area level surface of the wall.

11-3- the above structural walls has not the insulation seats by technical and constructive packaging, mainly from corrosion and moisture penetration, traction clay, salt corrosion and exhaustion.

11-4- roofs and the arch of that mentioned the buildings due to the lack of adequate insulation and moisture penetration of falling water, and washing cause lethargy of the vertical load-bearing the vertical structural walls, and the columns provides that explain.

11-5- foundation and the structural walls due to moisture passes through the ascending, descending, penetrating continuous weathering freezing removal periodic with clay mortar elimination, consolidation lethargy links have been.

11-6- no suppression packaging Horizontal curved roofs in the roofs, causing for sliding Horizontal roof and at the top of the side to create a diversion displacement of up to 60 cm into the central yard.

11-7- deviation non-vertical the edge of the central yard, which intensifies affects of (P-Δ) the curvature and buckling unauthorized the structural walls is marginal increase the risk of the structural walls collapse.

11-8- due to the very high risk for earthquake site lethargy lack of the structural walls integrity of the roof and walls of historical monuments, the seismic response will not be consistent.

11-9- considering the possible penetration seasonal rainfall and damaging freezing cracking in the future due to roofs insulation, the structural walls strength lethargy destruction of the elements of aggravated will be.

11-10- to preserve the authenticity of historical monuments during earthquakes of early intervention and assessment, the buildings, the evaluation should be complemented with a non-destructive, non-contact equipment will be done.

11-11- because buildings of historic any interruption of the seams are not completely certain about the historic structures any neighborhood in the central between 25-30 yards of neighboring the buildings have not been separated, the cumulative probability of in the inertial mass unwanted Horizontal earthquake reached for all that mentioned the buildings in the collection of the structural walls elements, there will be currently.

11-12- due to the lack of separate collection buildings of historic of the structural walls, especially the lack of alignment in the roof of the adjacent layers; problem were occurred may hit the roof level air destructive these historic structures, especially in the corners and at the junction of the roofs there will be aligned non-connected.

CONCLUSION

According to the results, the seismic rehabilitation of historical monuments currently reasons cited is required. So improving the quality and strength of materials is an essential building of historic. On the other hand the structural walls interventions in the historical monuments by cause a central courtyard with a minimum of procedures; (availability in the conditions the probability of reaching the collapse failure process structures fast) would be suitable and economical. In addition, in order to avoid duplication in the interventions should more accurate evaluation of seismic of the buildings the buildings set of historic Sadossaltaneh collection a comprehensive, integrated, non contact with specialized equipment for nondestructive even if a quantitative done. In this evaluation, modeling and analysis of the seismic performance of structural elements are particularly technical evaluation the interface between adjacent historic structures in that mentioned is essential.

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ANALYZING THE EFFECTS OF STAFFS' PSYCHOLOGICAL EMPOWERMENT ON PROMOTING ORGANIZATIONAL AGILITY IN ZAHEDAN DEPARTMENT OF ROADS & URBAN DEVELOPMENT

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ABSTRACT

One of the most important challenges of managers in present time in organizations is the absence of utilizing intellectual resources, cognitive capability and potentials of human resources. Most organizations do not use the potencies of their staffs efficiently and managers are not able to make use of their potential capacities. This study aims at analyzing the effects of staffs' psychological empowerment on promoting organizational agility in Zahedan Department of Roads & Urban Development. This study is applicable in terms of its goal and it is a descriptive survey due to its data collection method. In this research, in order to gather theories and to write the literature review, library research is done. To collect statistical data to test the hypotheses, field study in statistical population is done and inventories of Psychological Empowerment (Spreitzer, 1999) and Organizational Agility (Zhang & Sharifi, 2008) were used. Statistical population includes staffs in Zahedan Department of Roads & Urban Development and the sample size was determined by Morgan Table. SPSS software is used to analyze the data. Descriptive statistics are used to summarize the frequency, mean and standard deviation of demographic variables and main variables. Inferential tests including Pearson Correlation, Linear and Stepwise Regression and Friedman Test are used to rank the components of Psychological Empowerment. The result showed that there is a significant relationship between components of Psychological Empowerment and staffs' Organizational Agility.

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INTRODUCTION

Work force do not only need specialized training related to their jobs, but also They require other skills such as planning, acquiring and analyzing information, appropriate using of up-to-date electronic technologies and professional software, to improve the techniques relating to their occupation. In addition, they require being familiar with foreign languages, behaving well with managers, colleagues and clients, establish proper relationships, negotiation and responsibility techniques and accountability, self-training and study. In other words, to have an all-round organization development, employing workforce that acquires knowledge and skills in a way that not only have concentration on their profession affairs but also they have cultural development, creativity and exploring spirit. Unfortunately, absence of abovementioned factors i.e. "having knowledge and ability" and "desiring" is evident in most organizations, institutions, ministries, manufacturing companies and government agencies. Most expert forces and middle managers in public organizations only use incomplete instructions and technical jargons and participate in unproductive meetings, so it leads to low productivity. In other words, neither related organizations nor employees are beneficial to one another, Just they keep up appearances. Due to this long-lived defective cycle, it is accepted as a fact. It is as if the low productivity of Iranian workforce and low production efficiency and low rate of Iranian useful working hours below 2 hours a week, compared with Japanese 8 hours a day and Korean 10 hours a day is something natural. In researcher's opinion the solution of this big problem which its negative consequences has led Iran to continuous backwardness, is the agility of the organization through proper, permanent and purposeful training of workforce in governmental departments and abovementioned goals should be achieved in a midterm period. Empowering the staffs in Department of Roads and Urban Development under the supervision of Ministry of Roads is of great importance and due to the type of staffs' activities and duties, the organizational agility becomes vital. One of the organization's instruments for achieving agility is the workforce. In fact, the workforce as the main sector is an important instrument in making an organization agile. To achieve the purpose, organizations need empowered staffs. Staffs' empowerment includes systems, methods and practices which develops the competence and capability that improve productivity, development, growth and prosperity of the

organization and workforce in line with its goals [1]. In an article under the title of "empowering the staffs: a new strategy for improving the performance of workforce", It is emphasized that empowerment is the main part of organizational growth and development [2].

Several researches showed the effect of staffs' empowerment on improving their performance and promoting the organization functionality. Empowerment may have important behavioral consequences; for example Gicas found out that the feeling of competency leads to innovation, attempt and perseverance in challenging situations. According to researches done by Deci and Ryan (1998), employees' freedom of actions leads to immediate feedback in case of troubles in workplace. In addition, the relationship between freedom of action with efficacy is confirmed by cognitive and motivational approaches. Cognitive theorists believe that because employees have more information than their heads, so they can have better planning, higher ability of barriers recognition and better performance. From motivational point of view, Thomas and Timon found that empowering the staffs with freedom of action stimulate the adequate motivation for performance improvement [3], [4].

Continuous changes in technology and the change of clients' mentality has created the need for continuous changes in strategies and organizational planning. So the organization must be agile and flexible in facing the barriers and use of opportunities. The presence of flexible structures, multi-skilled workers, giving importance to competent programs and finally creating related culture are important tools to adapt to new conditions in changing situations. The purpose of this study is to introduce staffs empowerment as a tool and a pattern for improving the index of organizational agility. The study investigates whether empowerment and its components has an effect on organizational agility[5], [6].

RESEARCH HYPOTHESES

Main hypothesis:

Empowering staffshas an effect onorganizational agility in Zahedan Department of Roads & Urban Development.

Secondary Hypotheses:

- Staffs' feeling of competence has an effect onorganizational agility in Zahedan Department of Roads & Urban Development.
- Staffs' feeling of meaningful has an effect onorganizational agility in Zahedan Department of Roads & Urban Development.
- Staffs' feeling of effectiveness has an effect onorganizational agility in Zahedan Department of Roads & Urban Development.
- Staffs' feeling of having a choice has an effect onorganizational agility in Zahedan Department of Roads & Urban Development.
- Sharing information with staffs has an effect onorganizational agility in Zahedan Department of Roads & Urban Development.

METHOD

Due to nature of the issue, the study is descriptive in terms of correlation and it has a practical purpose. This study adopts a survey method and aims at determining the effect of empowering staffs on organizational agility in Zahedan Department of Roads & Urban Development. To collect the required data for conducting this study, library research and field methods (inventories of Psychological Empowerment by *Spreitzer (1999) and* Organizational Agility by *Zhang & Sharifi (2008)*) are employed [7], [8]. Statistical society include all staffs in Zahedan Department of Roads & Urban Developmentin 1394 which equals to 415 employees. Sampling is done by Cochran test and 217 people is chosen. Distribution of questionnaires were random to have an equal chance of being a participant to each employee. To analyze the data, SPSS software is used. Descriptive statistics are used to summarize the frequency, mean and standard deviation of demographic variables and main variables. Inferential tests including Pearson Correlation, Linear and Stepwise Regression and Friedman Test will also be used.

FINDINGS

Hypothesis Testing

Main hypothesis: Empowering staffshas an effect onorganizational agility in Zahedan Department of Roads & Urban Development.

H₀: Empowering staffshasn't an effect onorganizational agility in Zahedan Department of Roads & Urban Development.

H₁: Empowering staffshas an effect onorganizational agility in Zahedan Department of Roads & Urban Development.

To determine the effectiveness, goodness-of-fit in regression model was analyzed which was discussed below. To propose the model of the relationship between Psychological Empowerment (Y) and Organizational Agility (X) after investigating its adequacy indicators in below table, the model is presented.

Table: 1. Goodness of fit of regression model between empowering and agility

R	R Square	Adjusted R Square	Std. Error of the Estimate
.757	.573	.571	0.319

The relationship between independent variables and the dependent variable equals to .757. R Square is .573 which shows that 57.3 percent of variation in psychological empowering is predicted by organizational agility. Because this measure do not consider the degree of freedom, adjusted R Square was used which equals to 57.1 in this study. According to the indices, the model was adequate.

Table: 2.Regression equationof organizational agility

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig
		B	Std. Error	Beta		
1	Constant	-0.374	0.251	0.757	-1.488	0.000
	empowerment	1.01	0.063		16.14	
Dependent Variable: organizational agility						

a
riable in regression equation is the core of regression analysis which can be seen in Table 2 The regression equation is provided by unstandardized coefficients.

Organizational agility = .374 + (1.01) psychological empowerment

It can be said that with increase of one unit of each independent variable depending on the written coefficient, the dependent variable is increased. In other words with increase of one unit in empowerment, the standard deviation 1.01 unit of organizational agility is increased, so they have positive relationship. T-test relating to regression coefficients are displayed in the table for independent variable as well. The sig. value equals to .000, so psychological empowerment has a meaningful effect on organizational agility.

Sub- hypothesis1: Staffs' feeling of competence has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H₀: Staffs' feeling of competence hasn't an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H₁: Staffs' feeling of competence has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

To determine the effectiveness, goodness-of-fit in regression model was analyzed which was discussed below. To propose the model of the relationship between Staffs' feeling of competence (Y) and Organizational Agility (X) after investigating its adequacy indicators in below table, the model is presented.

Table: 3. Goodness of fit of regression model between Staffs' feeling of competence and agility

R	R Square	Adjusted R Square	Std. Error of the Estimate
.729	.531	.528	0.335

The relationship between independent variables and the dependent variable equals to .729. R Square is .531 which shows that 53 percent of variation in Staffs' feeling of competence is predicted by organizational agility. Because this measure do not consider the degree of freedom, adjusted R Square was used which equals to 52 in this study. According to the indices, the model was adequate.

Table: 4.Regression equationof organizational agility

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig
		B	Std. Error	Beta		
1	Constant	1.58	0.143	0.729	11.09	0.000
	Staffs' feeling of competence	0.541	0.036		14.81	
Dependent Variable: organizational agility						

The inserted variable in regression equation is the core of regression analysis which can be seen in **Table -2** the regression equation is provided by unstandardized coefficients.

Organizational agility = 1.58 + (0.541) Staffs' feeling of competence

It can be said that with increase of one unit of each independent variable depending on the written coefficient, the dependent variable is increased. In other words with increase of one unit in Staffs' feeling of competence, the standard deviation 0.541 unit of organizational agility is increased, so they have positive relationship. T-test relating to regression coefficients are displayed in the table for independent variable as well. The sig. value equals to .000, so Staffs' feeling of competence has a meaningful effect on organizational agility.

Sub- hypothesis2: Staffs' feeling of meaningful has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H₀: Staffs' feeling of meaningful hasn't an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H₁: Staffs' feeling of meaningful has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

To determine the effectiveness, goodness-of-fit in regression model was analyzed which was discussed below. To propose the model of the relationship between Staffs' feeling of meaningful (Y) and Organizational Agility (X) after investigating its adequacy indicators in below table, the model is presented.

Table: 5. Goodness of fit of regression model between Staffs' feeling of meaningful and agility

R	R Square	Adjusted R Square	Std. Error of the Estimate
.159	.025	.020	18.07

The relationship between independent variables and the dependent variable equals to .159. R Square is .025 which shows that 2.5 percent of variation in Staffs' feeling of meaningful is predicted by organizational agility. Because this measure do not consider the degree of freedom, adjusted R Square was used which equals to 2 in this study. According to the indices, the model was adequate.

Table: 6.Regression equationof organizational agility

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig
		B	Std. Error	Beta		
1	Constant	3.06	0.273	0.159	11.228	0.026
	Staffs' feeling of meaningful	0.147	0.066		2.24	
Dependent Variable: organizational agility						

The inserted variable in regression equation is the core of regression analysis which can be seen in Table 2 the regression equation is provided by unstandardized coefficients.

Organizational agility = 3.06 + (0.147) Staffs' feeling of meaningful

It can be said that with increase of one unit of each independent variable depending on the written coefficient, the dependent variable is increased. In other words with increase of one unit in Staffs' feeling of meaningful, the

standard deviation 0.147 unit of organizational agility is increased, so they have positive relationship. T-test relating to regression coefficients are displayed in the table for independent variable as well. The sig. value equals to 0.026, so Staffs' feeling of meaningful has a meaningful effect on organizational agility.

Sub- hypothesis3: Staffs' feeling of effectiveness has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H$_0$: Staffs' feeling of effectiveness hasn't an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H$_1$: Staffs' feeling of effectiveness has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

To determine the effectiveness, goodness-of-fit in regression model was analyzed which was discussed below. To propose the model of the relationship between Staffs' feeling of effectiveness (Y) and Organizational Agility (X) after investigating its adequacy indicators in below table, the model is presented.

Table: 7. Goodness of fit of regression model between Staffs' feeling of effectiveness and agility

	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.673	0.453	0.450	0.361

The relationship between independent variables and the dependent variable equals to .673. R Square is .453 which shows that 45.3 percent of variation in Staffs' feeling of effectiveness is predicted by organizational agility. Because this measure do not consider the degree of freedom, adjusted R Square was used which equals to 45 in this study. According to the indices, the model was adequate.

Table: 8.Regression equationof organizational agility

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig
		B	Std. Error	Beta		
1	Constant	1.59	0.165	0.673	9.65	0.000
	Staffs' feeling of effectiveness	0.538	0.042		12.68	
Dependent Variable: organizational agility						

The inserted variable in regression equation is the core of regression analysis which can be seen in Table 2 the regression equation is provided by unstandardized coefficients.

Organizational agility = 1.59 + (0.538) Staffs' feeling of effectiveness

It can be said that with increase of one unit of each independent variable depending on the written coefficient, the dependent variable is increased. In other words with increase of one unit in Staffs' feeling of effectiveness, the standard deviation 0.538 unit of organizational agility is increased, so they have positive relationship. T-test relating to regression coefficients are displayed in the table for independent variable as well. The sig. value equals to .000, so Staffs' feeling of effectiveness has a meaningful effect on organizational agility.

Sub- hypothesis5: Staffs' feeling of having a choice has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H$_0$: Staffs' feeling of having a choice hasn't an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H$_1$: Staffs' feeling of having a choice has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

To determine the effectiveness, goodness-of-fit in regression model was analyzed which was discussed below. To propose the model of the relationship between Staffs' feeling of having a choice (Y) and Organizational Agility (X) after investigating its adequacy indicators in below table, the model is presented.

The relationship between independent variables and the dependent variable equals to .446. R Square is .199 which shows that 19.9 percent of variation in Staffs' feeling of having a choice is predicted by organizational agility. Because this measure do not consider the degree of freedom, adjusted R Square was used which equals to 19.5 in this study. According to the indices, the model was adequate.

Table: 9. Goodness of fit of regression model between Staffs' feeling of having a choice and agility

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.446	0.199	0.195	0.437

Table: 10.Regression equationof organizational agility

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig
		B	Std. Error	Beta		
1	Constant	2.16	2.18	0.446	9.93	0.000
	Staffs' feeling of having a choice	0.375	0.054		6.94	
Dependent Variable: organizational agility						

The inserted variable in regression equation is the core of regression analysis which can be seen in Table 2 the regression equation is provided by unstandardized coefficients.

Organizational agility = 2.16 + (0.375) Staffs' feeling of having a choice

It can be said that with increase of one unit of each independent variable depending on the written coefficient, the dependent variable is increased. In other words with increase of one unit in Staffs' feeling of having a choice, the standard deviation 0.375 unit of organizational agility is increased, so they have positive relationship. T-test relating to regression coefficients are displayed in the table for independent variable as well. The sig. value equals to .000, so Staffs' feeling of having a choice has a meaningful effect on organizational agility.

Sub- hypothesis5: Sharing information with staffs has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H₀: Sharing information with staffs hasn't an effect on organizational agility in Zahedan Department of Roads & Urban Development.

H₁: Sharing information with staffs has an effect on organizational agility in Zahedan Department of Roads & Urban Development.

To determine the effectiveness, goodness-of-fit in regression model was analyzed which was discussed below. To propose the model of the relationship between sharing information (Y) and Organizational Agility (X) after investigating its adequacy indicators in below **[Table-11]**, the model is presented.

Table: 11. Goodness of fit of regression model between Sharing information and agility

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.326	0.106	0.102	0.462

The relationship between independent variables and the dependent variable equals to .326. R Square is .106 which shows that 10.6 percent of variation in sharing information is predicted by organizational agility. Because this measure do not consider the degree of freedom, adjusted R Square was used which equals to 10.2 in this study. According to the indices, the model was adequate.

Table: 12.Regression equationof organizational agility

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig
		B	Std. Error	Beta		
1	Constant	2.22	0.302	0.326	7.36	0.000
	Sharing information	0.347	0.072		4.80	
Dependent Variable: organizational agility						

The inserted variable in regression equation is the core of regression analysis which can be seen in **[Table -2]** the regression equation is provided by unstandardized coefficients.

Organizational agility = 2.22 + (0.347) Sharing information

It can be said that with increase of one unit of each independent variable depending on the written coefficient, the dependent variable is increased. In other words with increase of one unit in Sharing information, the standard deviation 0.347 unit of organizational agility is increased, so they have positive relationship. T-test relating to regression coefficients are displayed in the table for independent variable as well. The sig. value equals to .000, so Sharing information has a meaningful effect on organizational agility.

RESULT AND DISCUSSION

The primary and secondary hypotheses were confirmed due to the strong correlation between "staffs' psychological empowerment" and "organizational agility". Confirmation of these hypotheses are in line with psychological empowerment models of *Thomas and Vlthvs (1990), Cantor (1997) and Spreitzer (1384).*The result of statistical analysis showed that it is in accordance with the results of Counter, Riley, Bentley and Lane (2003) and Olive (2004) who declared that increasing the empowerment leads to staffs agility in organizations[9], [10], [11] [12]. Finally, these suggestions are proposed:

- Creating the feeling of self-efficacy in staffs, and the feeling that they have the ability to fulfil the job affairs successfully. The empowered people not only have the sense of competency but also feel confident that they can do duties properly so that the organizational agility is improved.
- Staffs participate in organizational decisions to believe that they can make a change in their working environments.
- Assigning tasks to working groups leads people to have innovative measures, to make independent decisions and to test new thoughts.
- Teaching of different technical and managerial methods in organizations enables them in conducting activities. Learning suitable skills through training programs helps employees to make accurate decisions with the least number of mistakes and the highest quality.

MANAGEMENT

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None

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ARTICLE   **OPEN ACCESS**

THE IMPACT OF EXCHANGE RATE FLUCTUATIONS AND INFLATION ON THE AMOUNT OF DEPOSIT OF CUSTOMERS (CASE STUDY: BANK SADERAT, HORMOZGAN PROVINCE)

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ABSTRACT

Aims:The aim of this study is to evaluate the effects of exchange rate fluctuations and inflation on the amount of deposits of customers through a case study on Bank Saderat branches, Hormozgan province.Materials and methods:.The present study is research- functional and in terms of purpose and from the perspective of data collection, is a sort of research - descriptive survey. The study population consists of all the branches of Bank Saderat in Hormozgan province .The sample size using Cochran sampling formula includes 20 branches. Also, to collect data related to the study variables, the audited financial   statements contained in the data bases of Bank Saderat, Hormozgan province have been used. Smirnov normalization test-Kolmogornov to normalize and regression test and Pearson's correlation coefficient and maintain the predictive relationship between variables and variance analysis to evaluate the impact of variables on each other, were used.Results:The results showed that there is not a significant relationship between the long-term exchange rate fluctuations and the depository in bank branches in the province, But there is a significant correlation between the short-term deposit rates and exchange rate volatility and inflation rates and long-term investment and short-term deposits.

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INTRODUCTION

Given the importance of economic growth and exchange rate fluctuations, it is essential to examine the reasons and factors affecting it. Economic growth literature shows that various factors are effective on these variables of which the most important ones are the inflation   and exchange rates fluctuations.

On the other hand, inflation which is one of the main problems, especially in developing countries, have mainly the adverse effects on the growth and economic development. Due to the devastating effects of inflation, its control as one of the objectives of macro-economic policies has always been considered by the economists. Within a decade, economists have found that floating exchange rates are more variable than fixed rates. But if the basic economic indicators of instability in the system do not change, constant currency exchange   rates fluctuations will lead only to a temporary increase in the volatility of currency exchange rates.

Perhaps because of higher instability of floating exchange rates, the basic economic variables vary[1].On the other hand financial   and banking   institutions   will succeed when implementing programs by careful planning to attract the optimal allocation for processing on their behalf. Absorption of resources is considered   as key and strategic objectives and play an important role in providing banking services and is an important indicator in assessing the success rates of banks. After all, the currency exchange rate policy will be selected by the authorities. Unfortunately, there are very little evidence of a systematic relationship between exchange rates and measurable macroeconomic phenomena in absorbing deposits and this is the minimum average for countries with low inflation and high and medium frequencies.

RESEARCH LITERATURE

Exchange rate fluctuations

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Today, banks are as the most important elements play an important role in our economic monetary market [2].With the development of financial markets, the activity of banks and financial institutions has become more widespread and no doubt economic development is not possible without considering the role of banking and money markets. Banks are considered as the main providers of financing real sector of the economy (industry, agriculture and services). Inefficiency of the banking system in mobilizing and allocating financial resources will lead to waste of resources and fueling the economic recession[3].

The main economic problems arises from exchange rate changes. Since the collapse of Bretton Woods systems in March 1973, there is a high degree of volatility in exchange rates. One problem that has been considered by the participants in financial markets, economists experts on trade, the popular press and policy-makers is the impact of this volatility on international trade. Exchange rate, a key variable in economic policy-making has been considered. So, a group of experts, particularly in developing countries, speak of this variable as a nominal anchor. Exchange rate policy, is the regulator of the inflow and outflow of foreign currencies in the national economy and thereby the entry and exit of goods, services and capital is defined in a country with other countries [4].

The main causes of wide fluctuations and exchange rate jumps in the unofficial market should be probed in developments of supply and demand in the foreign exchange market. On the economic clear basis, the root of leap should be probed in demand for currency exchange rates or reducing the supply of currency or a combination of both. When the exchange rate varies , the assets , foreign debts, income and many other factors will change [5].Thus, changes in exchange rates can have a significant impact in attracting banks, resources and deposits rates of the customers with respect to the exchange rates [6].

Volatility of exchange rates is a sign of instability in the basic economic structure. A flexible exchange rate should not be an unstable currency exchange one. If this is the case, there is mainly an instability base on economic conditions[1].The volatility of currency exchange rates, is a source of risk of currency exchange rate and has a special effect on the volume of international trade and consequently on the balance of payments.

Volatility of exchange-rate, increases the uncertainty of profits of foreign currency contracts because this risk will lead the risk factors to risk their activities more towards safer domestic markets.

On the other hand, higher volatility of currency exchange rates and therefore its higher risk represents opportunities for gaining profits and can increase business[7].

Inflation rate

In the general expression, inflation is defined as a constant general rise in prices. Economists have offered various definitions of inflation. Inflation is a situation where the general price level constantly increases over time. Importantly, the definition of inflation, the element of time and continuation of increase of the general level of prices, which means that the prices should increase steadily over time. If prices are increased within a certain period then this uptrend is stopped would not be applied to the process of inflation, because rising in prices should be continued [8].According to the definitions listed in inflation it can be said that the main feature of inflation is the continuation of increase in prices.

The sudden increase in prices and the increase in the price of a particular good is not treated as inflation. To measure the inflation ,an index ,so called the volatility in prices is used in which the fluctuations of goods and services in a given year compared to the base year is evaluated.

The prices of goods and services used in the consumer prices index of measurement is the consumer,s prices (CPI) .
In Iran consumer,s prices of goods and services is called an index which is calculated and published by the Central Bank every month. Because of the diversity of types of inflation, It may not have the common origin. In addition to the theory of demand inflation and cost inflation causing inflation, it is the government spending or aggregate supply disruptions. There is a third theory about inflation caused by the monetarist theory. According to this view there is a direct relationship between money supply and inflation of the important effects on inflation the effects of inflation on savings can be traced.

Desire to make savings will have a negative effect on the society and people try to convert their liquidity and saving into a safer and more stable wealth Inflation could also increase investment and raise the level of production.

Moreover, inflation also affects the depository of the clients. In recent years, the growth of liquidity has been relatively accelerated high. Much part of liquidity includes private sector deposits with banks. By definition, liquidity is the sum of money and quasi-money, including the amount of money in the hands of individuals and the private sector saving accounts and their timed funds with the banks. Therefore, regardless of the currency in the hands of the people and by taking deposits as the main liquidity, we can say that the money supply growth and the subsequent increase in inflation, banks deposits will also increase[2].

Depository

In general any system in accessing the macroeconomic goals of financial policy can plays a better role with the assistance of the banking networks and banks will be able to perform their role properly when they enjoy high financial sources.

In addition to these , interest rates of banks deposits should be paid special attention, so that in particular economic conditions of Iran , any change in interest rate could become an important tool in increasing a motivation to investors . Bank deposits is one of the useful tools for providing peace and comfort, as well as a solution to meet the needs of the society, especially in times of unpredictable future[9].

Today,bank deposits , is one of the most important economic and social tools and is avoidable in economic and services sectors and has an important and effective role in economic growth and development.

Bank deposits due to meet the financial demands of the people from the revenues has a significant position and are important for mobilizing the resources, finance and planning opportunities particularly for the banking system. Financial institutions and banks will be successful when they implement their exact programs to attract the optimal allocation and without proper planning it may not be possible unless they have the right information about the factors affecting the growth of deposits .
One of the main activities of banks , is the financial resource mobilization . In the banking industry there are many factors affecting the financial resources [10].Investments in banks is one of the major part of savings of people and constitute the main source of economic investments[11].Reducing interest rates of banks deposits, regardless of macroeconomic indicators, including inflation, has negative consequences on banks.

In this regard, if the interest rate falls, the owners of long-term deposits who have experienced a decrease in the interest, they will demand their deposits and use them in the parallel markets such as stock markets, real estates, gold and etc.) or they will utilize their resources to obtain higher profits in unorganized monetary markets and other investment opportunities.
The result of such trend , is the formation of bubble stock market , real estate, gold, etc., and eventually causing inflation pressures. It should be noted that the policy of bank increased interest rates with the control of inflation and its decrease can neutralize the negative effects of fluctuations in parallel markets, and change the combination of bank deposits in favor of long-term deposits providing the banks with long term facilities[11].

Research Hypotheses

1- It seems that exchange rate fluctuations affect the long-term deposits of customers in Bank Saderat branches in Hormozgan province.
2- It appears that fluctuations in exchange rates affect short-term deposits of customers in Bank Saderat branches of Hormozgan province.
3-It looks that volatility of inflation rates affect the long-term of customers, deposits in Bank Saderat branches in Hormozgan province
4- It seems that volatility of inflation rates affect the short-term customer deposits in the bank branches in the province.

MATERIALS AND METHODS

This research is an applied research because the results will be analyzed by the organization. In terms of data collection, according to the study which intends to evaluate the effect of exchange rate fluctuations and inflation in the bank deposits of customers in Hormozgan province, is a survey , descriptive and correlational research. In this study,in order to collect the data, library studies and field surveys methods have been used. The data collection tools in this research includes library studies, and the documents surveys.

Also, to collect the data on the variables, audited financial statements have been extracted from Bank Saderat, Hormozgan databases. The study population is consisted of 85 branches of Hormozgan province. The statistical sample based on the limited population through Cochran's formula was calculated. This number included 20 branches of the province. To analyze the collected data and approval or disapproval of the hypotheses, variate and multiple regression methods were used.
Smirnov – Kolmogorov test for significant regression model was used for testing. The statistical SPSS software, version 21, has been used in this study.

Data analysis

Checking the normality of the data using the Kolmogorov - Asmirnov test- Before any test, that is performed by normality assumption, a normality test shall be carried out. In case of normal distribution of collected data to test parametric and non-parametric hypotheses should be used in case of abnormality.

Table: 1.Data normalization using the Kolmogorov-Smirnov test

		Exchange rate fluctuations	Inflation rates fluctuations	Short term deposit	Long term deposit
No.		20	20	20	20
ParametersNormal a,b	Mean	3.289	3.247	6.847	3.258
	Deviation standard	2.193	2.231	3.841	2.0147
	Absolute	0.358	0.437	0.422	0.411
	Positive	0.354	0.357	0.409	0.363
	Negative	-0.419	-0.437	-0.422	-0.411
Kolmogorov-Smirnov		5.369	7.148	7.892	6.841
Significant level		0.116	0.121	0.212	0.142

Considering the results of the above **[Table-1]**, since the significant results level for all components is greater than 0.05, so the frequency distribution is the normal one.

Hypotheses Tests

The results of the research study are as follows

The first hypothesis
$\rho = 0$ exchange rate fluctuations do not affect long-term customers deposits in branches of Bank Saderat of Hormozgan province.
$\rho \neq 0$ exchange rate fluctuations affect long-term customers deposits in branches of Bank Saderat in the province.

The following [**Table -2**] shows the results of analysis of variance to verify that there is a linear relationship (significant) between independent variables and the dependent variable.

Table 2: Table ANOVA Hypothesis 1

	model	Total square	Degrees of freedom	Mean Square	F	Significant level.
1	regression	1.659	1	1.659	0.740	0.401
	The remaining	4.035	19	2.242		
	Total	4.201	20			

As shown in **[Table-3]**, analysis of variance regression (ANOVA) a significance level of the model (sig) equals to 0.401. Since this amount is more than 0.05, the above null hypothesis (independent variables coefficients equal to zero) is approved at the 95% confidence level which means that there is no linear relationship between independent variables and the dependent variable, .

Table: 3. Regression coefficients H1

Model		Non Standardized coefficients		Standardized coefficients			
		B	Standard deviation	Beta		t	Significant level
1	Exchange rate fluctuations	1`96	125			1.573	0.133
	The long-term deposit	0.284	0.330	0.199		0.860	0.401

As shown in table of model coefficients:
The significance level (sig) variable size is more than 0.05 and it is meant that the above null hypothesis (that the coefficient of this variable is equal to zero) was approved, and the impact of exchange rate fluctuations on the long-term deposits is not significant.

The second hypothesis

H1 : The fluctuations in exchange rates affect short-term deposits of customers in bank branches in the province.
H0 : The fluctuations in exchange rates affect short-term deposits of customers of the bank branches in the province.

Table: 4. Analysis of Variance Hypothesis 2

Model		Total of squares	Degrees of freedom	Square mean	F	Significant level.
1	Regression	1.6091	1	1.609	0.717	0.008
	Remaining	4.041	19	2.244		
	Total	4.213	20			

As shown in **[Table-4]** of variance regression analysis (ANOVA) a significance level (sig) of the model equal to 0.008 can be observed. Since this amount is less than 0.05, the above null hypothesis (independent variables coefficients equal to zero) is rejected at the 95% of confidence level which means that there is a linear relationship (i e, model there is significant) between independent variables and the dependent variable.

Table: 5. Regression coefficients H2

Model		Significant level		T	Standardized Coefficients	Non standardized coefficients	Model
		B	Standard Deviation		Beta		
1	Exchange rates fluctuations	201	122			1.636	0.119
	Amount of short term deposit	0.675	0.798		0.169	0.847	0.408

As shown in table of model coefficients :
The significance level of variable size (sig) is less 0.05 is the and this means that our null hypothesis (that the coefficient of this variable is equal to zero) at the 99% was rejected and the effect of exchange rate fluctuations on the amount of short-term deposits is significant.

Third Hypothesis

H1: The fluctuations in inflation rates affect long-term customers, deposits in branches of Bank Saderat in the province.
H0: The fluctuations in inflation rates do not affect long-term customers, deposits in branches of Bank Saderat in the province.

Table:6.Analysis of Variance Hypothesis 3

Model		Square total	Degrees of freedom	Square Mean	F	Significant level
1	Regression	3.269	1	3.269	0.520	0.000
	Remaining	1.132	19	6.288		
	Total	1.165	20			

As shown in table of regression variance analysis (ANOVA) the significance level (sig) of the model is equal to 0.000. Since this amount is less than 0.05, the above null hypothesis (independent variables coefficients equal to zero) is rejected at the 95% confidence level which means that there is a linear relationship (ie, model there is significant) and regression model with the above hypothesis can be tested and evaluated.

Table: 7. Regression coefficients H3

	Model	Non Standardized coefficients		Standardized coefficients	T	Significant level
		B	Standard Deviation	Beta		
1	Inflation rates fluctuations	195	662		2.954	0.008
	Amount of long term deposits	0.013	0.017	0.168	0.721	0.480

As shown in the **[Table-7]** of model coefficients:The significance level (sig) of the variable size is smaller than 0.05, meaning that the above null hypothesis (that the coefficient of this variable is equal to zero) was rejected at the 99% confidence level and volatility of inflation rates affect long term deposits.

The fourth hypothesis

H1: The fluctuations in inflation rates affect short-term deposits of customers of Bank Saderat branches in the province.

H0: The fluctuations in inflation rates do not affect short-term deposits of customers of Bank Saderat branches in the province.

Table: 8.Analysis of Variance Hypothesis 4

	Model	Total Squares	df	Square mean	F	Significant Level
1	regression	1.871	1	1.871	0.294	0.594
	The remaining	1.141	19	6.366		
	Total	1.165	20			

As shown in table of variance regression analysis (ANOVA) the significance level (sig) of the model is equal to 0.594. Since this amount is larger than 0.05, the above null hypothesis (independent variables coefficients equal to zero) is approved at the 95% confidence level which means that there is a linear relationship (ie, model there is significant) and regression model with the above hypothesis can be tested and evaluated.

Table: 9. Regression coefficients P4

	Model	Non Standardized Coefficients		Standardized Coefficients	t	Significant leve
		B	Standard Deviation	Beta		
1	Inflation rates fluctuations	188.240	654.721		2.875	0.010
	Short term deposits	0.023	0.043	0.127	0.542	0.594

As shown in table of the model coefficients:

The significance level (sig) of the variable size is larger than 0.05, meaning that the above null hypothesis (that the coefficient of this variable is equal to zero) was rejected at the 99% of confidence level and volatility of inflation rates on short-term deposits is significant.

RESULTS AND DISCLOSURE

The research hypothesis, with regression, Pearson correlation coefficient test, F, Smirnov - Kolmogorov test, T statistics were analyzed. According to the results of applied research, the first hypothesis was rejected and the researcher concluded that exchange rate fluctuations could not affect the long-term deposits of the customers.
By studying this hypothesis it becomes clear tha there is a consistency in the results of research and theories Rasooli and Azad, 2013, Brukman, Añelo, 2010, Aali and Ahmadi, 2011, Ali, 2011, Matoofi and co-workers,2009 , Khaksari, 2006, Rahatan, 2012and Satyo, 2008.

In the second hypothesis, the test results proved its significance and positivity of Statistics ,T , and the researchers concluded that exchange rate fluctuations will affect the amount of short-term deposits of the customers.By studying this hypothesis it becomes clear that the results of research and theories Pourheydari et al., 2009, Kim, 2008, Jahankhani and Ghorbani , 2005, Yung, 2006, Khadem and Ahmedi, 2008 , Khani, 2012, Pourheydari et al., 2009, Baty and Weber, 2007, Ramalyngvoda et al, 2012, matoofi et al., 2009, Ahanj, 2011, there is a consistency[11,12,13]. .

In the third hypothesis, the test results proved its significance and positivity of Statistics ,T , and the researchers concluded that exchange rate fluctuations will affect the amount of short-term deposits of the customers.By studying this hypothesis it becomes clear that the results of research and theories Ghaemi and Vatanparast , 2005, Rasooli 2013, Stein, 2003, Binysh and Vargas, 2002, unik, 2006, Kyle and Steve, 2012, Hatan, 2012,(Ahmad Pur and Ghahramani , 2012, RAHIMIAN et al., 2012, Reza Zadeh, Azad , 2008, Hashi, 2008,,Lintner, 1965 ,Khani, 2012, Vakili Fard and Rostami, 2010, Tehrani and Noorbakhsh, 2006, there is a consistency.

By studying this hypothesis it becomes clear that the results of research and theories High, 2011, Binysh and Vargas, 2002, Khadem , 2008, Ghaemi l andvatan parast ,2005, Mehrani et al 2010, Diamond, 1991, Miller, 1977 and 1991, Hatan, 2012, (Ahmad Pour and Ahmedi,2008), (Pourheydari et al., 2009), (Khaksari,2006), (Kashanipoor and Momeni , 2011 and Ahmad Pur andGhahramani , 2012 there is a consistency[11].

CONFLICT OF INTEREST
Authors declare no conflict of interest

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ARTICLE **OPEN ACCESS**

INVESTIGATION, IDENTIFICATION AND RATING OF THE IMPLEMENTATION OF COMPREHENSIVE BRAND MANAGEMENT PROGRAMS IN COMPETITIVEMARKETS USING THE (PCDL) PATTERN

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ABSTRACT

Brand is a sign that the products or services of an organization (or organizations), are known by it. Accordingly, it should be noted that brand and branding, is not a process such as advertising and access to markets and customer but it is in fact a process and procedure that makes the view for customer that this is just your organization that realizes his or her problem and or need and tries to solve the problem or meet that need. The present study is done to investigate, identify and rate the implementation stages of comprehensive brand management programs in competitive markets using PCDL pattern in food industry companies in industrial park of Mashhad. In terms of goal, this study is applied and in terms of method is descriptive – survey and based on the relationship between variables is correlational research. A mixture of field and library method were used to collect data and information. The population of the study includes all people (N=90) working in food industry companies in industrial park of Mashhad. According to Morgan table, sample reduced to 73 participants. Data was analyzed using SPSS software. According to reviews of participants, the results showed that the performance of the brand is the first priority in rating the implementation stages of comprehensive brand management programs in competitive markets of food industry companies in industrial park of Mashhad. After that, the localization of the brand is the second priority, third priority is communications of brand message and brand value strength is the fourth priority.

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INTRODUCTION

In competitive environment, most researchers believe that brand is an important part of a business and asset of an enterprise and many businesses like to learn how create a successful brand. On of necessities to create a strong brand is to know all factors which create brand - specific [1] .Today, many organizations have come to the belief that their services and products brands are among their most precious assets. In modern and complex world, all of us whether individually or as business executives, are facing increasing options and reduced time for decision making. Accordingly, the ability of a brand to simplify consumer decision making, reducing risk and defining their expectations is valuable. One of the necessities of top management in each organization is creating powerful brands that promote their power and capabilities over the time while meet promises and commitments [2].

Brand – specific value has many benefits for companies and manufacturers. For example, if a brand has high value, the target consumer will have a positive behavior towards the brand that finally is ready to pay more money for the products, repeat the purchase, and exercise the word of mouth [3]. All such behaviors of the consumer would increase competitive condition and financial performance of the company. Brand – specific value creates loyalty in consumers, increases possibility to choose a brand, and companies can benefit from this advantage to develop their product portfolio. With the brand extension to new products, advertising costs will be reduced for new products. Other advantages of brand – specific value are giving patents and licenses to other companies, marketing communication effectiveness, chain stores willingness to put forth the product in their assortment, lack of demand elasticity to price and reducing the vulnerability of companies against competitors and economic downturns, value -specific maintenance and development. Brand is mostly a challenging and difficult activity so it is necessary to adopt a comprehensive vision of different attitudes towards influential factors on brand – specific value in order to extend brand – specific value appropriately. In today market environment, there are very different ways, through these programs, marketers can influence the creation and enhancement of brand – specific value. Distribution strategies, communication strategies, marketing strategies, pricing and other activities may be weaken or strengthenthe brand [4]

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In order to get competitive advantage and to be ready for entering global markets, promotion of Iranian's brand value – specific is very important. Thus, investigation of mix effect of marketing can help to identify the most influential factors for brand promotion and focus on such elements in marketing strategies and assign more resources. Company will be stronger by identification of factors influencing specific value of brand so financial performance increase. Due to the fact that brand is not defined correctly among Iranian companies and Iran has no global brand yet in such a way that share of Iran in 11000 billion US market is zero. Nowadays the necessity of branding in Iran felt more than ever. Thus examination of specific value of Iranian brand and investigating influential factors for brands is a very important step toward branding and Iranian brand promotion in order to enter global markets and compete with international brands. According to the importance of brand specific value we should focus on how value is created for brand by marketing mix to help managers use such information and promote and extend their brand value thus performance of the company will get better. The most important factors in building and strengthening brand specific vale are marketing activities. Brand specific valueis investment that has been made in the past marketing efforts. The companies made consumers aware of the brand through marketing activities and create a good image of the brand in their minds [4]. There are several reasons expressed for the growth in the literature on branding in today's industry. From the perspective of customers perceived reduced financial and non-financial risks and costs of research are key benefits. In brand owners view the key issues are ability to present better prices than competitors, ability to obtain market share, ability to retain customers thorough brand loyalty making and reducing marketing costs of services units, measuring brand specific value and considering cognitive aspects[5].

Proposed PCDL model can provide a useful guideline for mangers to make brand identity in target markets. With competition becoming more complex, managersface with challenges related to matching brands with changed expectations of customers. Among the various strategies that are available to managers, brand localization about customers' features of priorities, can help customers to acknowledge the superiority of brands. Localization in features or profits, will enable companies to strengthen their financial resources as much as possible. If the appearance and layout of the current product becomes obsolete, brandhas to go to higher levels or expected performance, to maintain itself in dynamic markets. Companies require to localize their brands in the minds of their customers. To achieve their desired goals in terms of communication strategy, they have to change innovative methods to attracttarget customers and finish the confusion and noise (through advertising). With increasing competition and the emergence of phenomena such as global markets, domestic industries of each country in order to stay in the area need to increase their competitive advantage. One of the strategic tools that causes commitment and frequency of consumption, increasing economic value for shareholders and expand economic activities beyond geographic boundaries, is brand value. Given the importance of brand specific value for companies to evaluate which of the comprehensive brand management implementation stages how and in what way create value for the brand, is essential.

Thus, in this research the effect of marketing mix on brand specific value and identifying branding stages in order to achieve profitability for company and reducing marketing costs and surpassing other competitors is necessary in food industry companies.

Given the importance of the issue, in present study we try to investigate, identify and rate the process of brand management comprehensive program in competitive markets of food industry companies of industrial park of Mashhad using PCDL pattern.

MATERIALS AND METHODS

The research method is applied based on the goal and is descriptive and survey and correlational analysis. The statistical population of the study includes all people working in food industry companies in industrial park of Mashhad that the number of them is limited. The time period includes the first half to the second half of 1394. Based on Cochran formula, N is equal to 73 that questionnaires were distributed randomly among them.

In conducting stage of the study, answering method for tests were described for participants in detail after some primary descriptions about measurement and the goal of the test. About moral considerations, after written consent from participants and giving information, we make them assure that the obtained information is used just in this study and preserved against any misuse. This questionnaire contained questions that could measure knowledge infrastructure capabilities, knowledge process capabilities, knowledge sharing and organizational effectiveness variables. Its answering scale was five-point Likert scale. To confirm the validity a copy of which was provided to instructors. Then some questions that were unintelligible, ambiguous or unrelated to the topic, location and population of the study were removed and some more clear questions were added. Cronbach's alpha was used to determine its reliability. The results showed that the questionnaire was reliable **[Table- 1].**

Table: 1. Cronbach's alpha value

Variables	Questions number	Cronbach's alpha coefficients
Brand localization	5	0.806
Brand message communications	5	0.701
Brand performance presentation	5	0.707
Brand value power	5	0.748

Conceptual model of relationship between research variables is as follow **[Figure- 1].** There are four factors including brand localization, brand message communications, brand performance presentation, and brand value power in PCDL model which is presented in the form of conceptual model.

Stage 1

Brand localization
- Profile
- Tangible features
- Intangible features
- Characteristics of the product functions
- Operational Benefits

Stage 2

Brand message communications
- comprehensive advertising brand
- using famous people
- program logo
- events
- presentation
- consumer

Stage 3

Brand performance presentation
- Product performance
- Service performance
- Attention to customers
- Customer satisfaction
- Customer happiness

Stage 4

Brand value power
- Linear extension
- Brand development
- Partial branding
- Shared branding
- Brand unity
- Social solidarity

Fig: 1. Research conceptual model, brand stages model in competitive market (PCDL), Temporal (2000)

……….

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[Table- 2] shows standard deviation and mean of research variables.

Table: 2. Descriptive statistics of research variables

Variable	Number	Mean	Min. score	Max. score	SD
Brand localization	73	3.81	2	5	0.71
Brand message communications	73	3.60	2	5	0.78
Brand performance presentation	73	4.18	2	5	0.71
Brand value power	73	3.35	2	5	0.72

In this section and next sections, research question are examined and answered. As mentioned above, the first research question is as follow:

Q1: Is brand localization stage effective in competitive markets of food industry companies of industrial park of Mashhad?

We can conclude that brand localization stage is effective in competitive markets of food industry companies of industrial park of Mashhad. In table below descriptive indices and the result of Student-t test to investigate the significant effect of participants mean scores are presented. **[Table- 3]**

Table: 3. Results of t-test to investigate brand localization stage in competitive markets of food industry companies of industrial park of Mashhad

Variable	Descriptive indices			Freedom degree	t statistics value	P-value
	Sample	Mean	SD			
Brand localization	73	3.81	0.71	72	9.768	0.000

Based on the views and opinion of participants, students-t value and P-value obtained from brand localization stage in competitive markets of food industry companies of industrial park of Mashhad is significant because significance value or P-value is less than test significance level or P-value <…… thus we can conclude with 95 percent confidence that: Brand localization stage is effective in competitive markets of food industry companies of industrial park of Mashhad. **[Table- 4]**

Q2: Is brand message communicationsstage effective in competitive markets of food industry companies of industrial park of Mashhad?

Table: 4. Results of t-test to investigate brand message communications stage in competitive markets of food industry companies of industrial park of Mashhad

Variable	Descriptive indices			Freedom degree	t statistics value	P-value
	Sample	Mean	SD			
Brand message communications	73	3.60	0.78	72	6.567	0.000

Students – t value or P-value or estimated possible significance value is bigger than test significance level (P-value = 0/000 < α = 0.05) thus zero hypothesis or the assumption that brand message communicationsstage is not effective in competitive markets of food industry companies of industrial park of Mashhad is rejected on 5 percent significance level. Thus we can conclude with 95 percent confidence that: Brand message communications stage is effective in competitive markets of food industry companies of industrial park of Mashhad.**[Table- 5]**

Q3: Is brand performance presentation stage effective in competitive markets of food industry companies of industrial park of Mashhad?

Table: 5. Results of t-test to investigate brand performance presentation stage in competitive markets of food industry companies of industrial park of Mashhad

Variable	Descriptive indices			Freedom degree	t statistics value	P-value
	Sample	Mean	SD			
Brand performance presentation	73	4.18	0.71	72	14.163	0.000

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Students – t value or P-value or estimated possible significance value is bigger than test significance level (P-value = 0/000 < α = 0.05) thus zero hypothesis or the assumption that brand performance presentation stage is not effective in competitive markets of food industry companies of industrial park of Mashhad is rejected on 5 percent significance level. Thus we can conclude with 95 percent confidence that: Brand performance presentation stage is effective in competitive markets of food industry companies of industrial park of Mashhad. **[Table-6]**

Q4: Is brand value power stage effective in competitive markets of food industry companies of industrial park of Mashhad?

Table: 6. Results of t-test to investigate brand value power stage in competitive markets of food industry companies of industrial park of Mashhad

Variable	Descriptive indices			Freedom degree	t statistics value	P-value
	Sample	Mean	SD			
Brand value power	73	3.35	0.72	72	4.169	0.000

Students – t value or P-value or estimated possible significance value is bigger than test significance level (P-value = 0/000 < α = 0.05) thus zero hypothesis or the assumption that brand value power stage is not effective in competitive markets of food industry companies of industrial park of Mashhad is rejected on 5 percent significance level. Thus we can conclude with 95 percent confidence that: Brand value power stage is effective in competitive markets of food industry companies of industrial park of Mashhad.**[Table-7]**

Q5: How is rating of comprehensive brand management programs implementation stages in food industry companies of industrial park of Mashhad?

Table: 7. Friedman test results for prioritization of comprehensive brand management programs implementation stages in competitive markets

Variable	Rate average	Priority
Brand localization	2.63	2
Brand message communications	2.30	3
Brand performance presentation	3.38	1
Brand value power	1.68	4

Based on the results from the table we can see that performance presentation of the brand is the first priority in rating of comprehensive brand management programs implementation stages in competitive markets in food industry companies of industrial park of Mashhad. The following is brand localization and the third priority is brand message communications and the last one is brand value power.

DISCUSSION AND CONCLUSION

In new era which is the age of merger and acquisitions of thecompanies, business brand value is a key factor in company value and stock exchange value and this is due to the power that a brand has in attracting new customers and retaining them.If the brand has great specific value, companies can reduce marketing expenses in the shadow of its existence. Because customers know it and are loyal, when negotiation and bargaining with distributers and retailers company has stronger position and lets the company to set higher prices because customers perceive is as higher quality brand. Company can increase its product range because customers are trusted in it and this can defend company against competitors' prices. Customers also advertise the brand for other so more customers will be attracted. Identifying the various aspects of a brand and its effects on the behavior and reactions of consumers, help companies to better design and implement their marketing plan. Understanding specific value aspects of the brand and comparing their effects helps managers to plan appropriately in order to achieve anticipated targets. In

present research we examined the role of brand localization, brand message communication, brand performance presentation and brand value power stages. Finally, we propose:

- The allocation of more financial resources to advertising , companies product performance

- The allocation of more financial resources to advertising , companies product performance

- Recounts the experiences of others shopping experience for products of the company

- Advertisement in order to remind intangible features of companies product

CONFLICT OF INTEREST

The author declares having no competing interests.

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IMPACT OF ARCHITECTURAL DESIGN CONDITIONS IN RESOLVING WELFARE SHORTAGES AND SOCIAL HARMS OF STUDENTS

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ABSTRACT

Enacted laws in any society are based on the words and any word requires interpretation so that purpose and intent of the legislator to be explained. Therefore, words form basis of every law and its content. Words create concepts and conceptual models are converted applied models, designs and programs. These models are always base of budgeting and resource allocation. This is also true in words such as student houses and dormitories. Different concepts are interrelated of each of these words and according to each of these conceptual models, designs and programs related to them will be different. What has been considered as dormitory has been followed by demands and supplied that it seems that they have lost their efficiency. Therefore, it is essential that budgeting and resource allocation methods in this area as result of change in word dormitory to house and creation of conceptual model and modern designs and programs. These measures could take place with the aim of structural reform in available resistance places and creating new plans in accordance with the new requirements in order to establish resistance places in future. The important issue in first step is possible by creating as appropriate title consistent with the new developments and needs that replacement of student house with dormitory can be interpreted accordingly.

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INTRODUCTION

Among the students' needs, settlement is the most fundamental. The importance of housing in general and dormitory in particular dormitory is being considered since it is followed by sense of safety. Dormitories help in student academic achievement and the establishment of life. However, if such shelter cannot create such mix, it will fail to add responsibility in acquiring knowledge and success to experience of students. Welfare of each society represents dignity and humanity of people and social cohesion of that society. One of the most important student welfare issues is their dormitory. Students are separated from their house and family with all emotional and spiritual relations in the most critical years of their life to continue their studies in university [1].

Dormitory role

The aim of education at the university is merely raising the mental level and filling it with various sciences, but it is expected that universities to prepare students in all mental, physical and emotional aspects. Accordingly, the objectives that can be considered for university are as follows:
- Constructive fostering and leading of human emotions and feelings
- Fostering human competency to live with other people
- Developing and clarifying the goal of life for students
- Creating and strengthening the independence, autonomy, and self-directed students
- Creating a sense of unity among students and the larger society in which they are living [2].
If these goals are accepted for university, classrooms, administrative organizations, university halls, libraries, and most importantly student dormitories will be place to foster human and its physical form will be developed in following specific objectives [3].

In addition, dormitories are laboratory for living in small social place within the large system of university and a part of the larger system of society. It is not necessary to establish dormitories for students in order to provide a place for sleeping, but it is necessary in order to take effective step in fostering student in dormitory. Students spend the

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important periods of their life in the dormitory. In this period, many aspects of their personality are shaped life principles and objectives are established [3].

Accordingly, in many large universities students have established houses to live there as interconnected family. In these houses, students enjoy actual sense of belonging. While the largeness of university is terrible for junior student, he will enjoy affection, friendship, emotional bond in dormitories and students houses. According to Manzar Sharif, a social professor in America, when dormitory provides a home space for students, it will be regarded as among the reference groups of students and they will try to coordinate themselves with it [2].

MATERIALS AND METHODS

The necessity of paying attention to dormitory design

Designing dormitory has paid attention of many people and any negligence in this area will impose irreparable damage for those living there and whole society. However, it seems that this issue has not been supported so much in Iran, and few studies have been conducted on various aspects of life in the theoretical area and they had no relevance with design of dormitory. In addition, less effort has been made to identify the difference between female and male students' needs and expectations and to reflect them in designing the current dormitories. As a result, dormitories of both groups of students have been designed and constructed in same way. Unfortunately, the urgent need to immediately construction and solving the problem of dormitory shortage with limited credits have caused that the main standard of designing to be limited for reducing per capita dormitory infrastructure and economically implementation of it. This limitation and hastiness of other principles that should be investigated in the dormitory design have been abandoned. However, lack of attention to educational issues reduces the quality of production at universities. Therefore, energies spent on educational issues, people properties, and country wealth will be wasted, and indifference people will be fostered [4].

Therefore, appropriate spaces should be created to do both tasks namely education and fostering. It means that beside the conventional educational spaces, we need space for fostering personalities of young people and their different talents.

Accordingly, the most appropriate place to establish these functions is vicinity of spaces related to spending leisure time by students and in vicinity of dormitories. These places are where students spent most of their time there, while the possibility of using these spaces should be provided for non-dormitory students (ibid.). On the other hand, students are the most intelligent and most talented people in any society and their mental and physical health play important role in growth and dynamism of society. Therefore, planning for developing the students' talent and maintaining the improving the health of students are considered as the main mission of educational institutions and universities in the country.

In this new environment, in addition to experience of continuous separation of family, student should adapt themselves with other students and live with them who are from different cultures mainly. Beside these mental pressures, the appropriateness of dormitory environment and lack of welfare facilities can increase the problems in passing through this critical stage. In fact, inappropriateness of new environment can be followed by mental problems and disorders having serious impact on mental health and educational affair of students, followed by academic failure or dropout [4].

In this regard, various researchers have examined the increased mental pressure and incidence of psychological factors in the students. Direct relationship between increased mental pressure and symptoms of mental disorders among students has been reported that this is higher in dormitory students based on their conditions. Emamzadee investigated the relationship between settlement and academic achievement has examined the relationship between economic problems and psychological pressure on students [5].
Dormitory life problems and issues of students.

As most of students are young and they enter to university in the initial stage of socialization, it is natural that they use comparative reactions to adapt themselves with new environment, and they may experience mental disorder of depression during the process (6).

Leaving family and coming to university are one of the major growth changes that most of students have experienced them. These changes can be the starting point for psychological problems in students. Virginia Ross (2004) stated that possibility of depression has been increased significantly during the years between 15 and 30, and in students, the possibility of anxiety disorders will be doubled in years after adolescence. On the other hand, leaving family and home, loss of support from peers and friends, getting into a strange and unfamiliar place and, the pressure resulting from high educational standards often cause higher stress in students. It finally can lead to severe problems such as depression and anxiety in students living in the dormitories [6].

According to Adams (2003), the pressure resulting from student life and student's psychological and biological readiness cause that rate of mental disorders among dormitory students to be increased. On the other hand, we are faced with the fact that mental disorders in students facing with dormitories are increased. Therefore, providing solutions by relevant officials to help students living in dormitories is an essential [7].

Problems in dormitories

Unfortunately, dormitories are faced with many problems nowadays such as the cultural and social problems and non-principal design of dormitories. Given the importance of paying attention to students' problems as future of society, identifying and trying to resolve these problems is important.
Cultural and social problems

Entering to dormitory, students are separated from environment lived there for many years to new and different environment. In this environment, people live beside each other with various cultures, attitudes, ethnicities, languages, personalities, and various academic disciplines, that each of them demands relevant interests and ideologies. Dealing with new people creates new relations, experiences and events. Having a long relation and living with roommates will be the beginning of the many impacts. Understanding new conditions completely, some of these students try to adapt themselves with it and use their new life as an opportunity. Thus, it can be said that the dormitory culture is a set of empathy, cooperation and harmony with life's adversities [8].

In this regard, multiple cultural problems such as lack of cultural and educational facility in dormitory, cultural difference in observing hygiene and cleanliness of the dormitory, the difference in hours of work and rest among students, student family cultural differences, difference in ethnic and regional sub-cultures, difference in morals and beliefs, drug addiction, smoking, as well as a variety of sexual perversions can be raised out for students [8].

Table: 1. problems in the dormitories of Tehran University[1]

Prioritizing the dormitory problems	f	%
Welfare health problems	108	34/5
large number of students in one room and accommodation problems	53	16/93
Lack of scientific, educational and internet facilities	47	15/0
Traffic regulations	26	8/3
Recreational Sports	17	5/43
Heating and cooling problems	6	1/9
Ethical problems	1	3/2

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Cultural conflict and confrontation and violence	9	2/87
Lack of security and noise	10	3/2
Insecurity	9	2/87
Cutting off water and electricity	7	2/23
Officials neglect	10	3/2
total	313	100

RESULTS

Dormitory design problems
One of the most important problems is non-principal design of the dormitories. Non-principal design means important factor such as users, public and private space separation from each other, considering and recognition of user and designing based on optimal per capita, as most important design issues, are considered.

Lack of attention to building use
One of the main problems of dormitories is that most of these buildings are residential or commercial buildings and they are not constructed particularly for dormitory. Therefore, optimum facilities such as library, stadium, computer and sufficient green space have not been provided for students [8].

Lack of attention to the necessity of the separation of private and public spaces
Usually, in dormitories, semi-private and private spaces, and semi-public spaces have not been separated clearly. Student residential spaces have been hardly changeable due to use of fixed furniture and the placement of doors and windows to create personal territory. Additionally, the rooms with low area have been located each other for use of great number of people. Services and kitchens that require all dormitory students require using them are some of the cases influencing criteria such as personal privacy, serenity, and comfort [9].
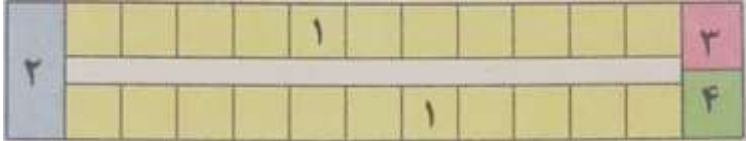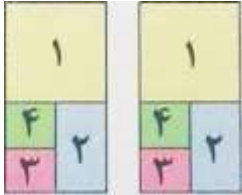
Lack of attention to the user (student)
Lack of paying attention to the issue of gender in terms of being different spiritually of two genders and different groups in designing dormitories can be factors affecting the life of dormitory students [9].

Table: 2. Percentage of responses given by students on type of dormitory [9]

Type of dormitory	Current dormitory (%
Corridor dormitory	41.9
Cluster dormitory	35.2
Suite dormitory	22.9
Total	100

Table: 3.Diagram of types of dormitories [9]

Type of dormitory	Name of spaces 1.Rooms, 2. Drawing 3. Bathrooms and health service 4. Kitchen
Corridor dormitory	
Cluster dormitory	
Suite dormitory	

Lack of attention to dormitory spaces per capita

With a glance at the student dormitories, it can be found that student dormitory per capita that should be 14 meters for each person and this standard has not been observed and unfortunately, it does not reach to more than 2 to 3 meters in many cases [1].

Summing up and providing guidelines to improve the existing problems
According to existing problems in dormitory that were discussed above, it seems that recognizing the needs of the students and trying to resolve them can eliminate many of current problems. In this regard, to improve the status of the dormitories, the following strategies have been proposed:

1. Dormitories not only should be desirable places for sleeping, but also they should provide appropriate positions of personal and academic development of students (Estrade, 2008). In this regard, if dormitories are reviewed for creating small learning communities in same disciplines, they will be safe and supportive environment to increase dialogues and extracurricular activities as well as the strengthening of life skills and compatibility and more interaction with the environment, personal and career development, and participating in managing the social affairs [3].

2.

2. Providing exciting and safe facilities and recreations such as ease of access to computers and internet services, equipped libraries, sports competitions, and scientific-tourism camps, appropriate bed should be provided for healthy behaviors of students.
3. With regard to the problems of students in boring space of dormitories, the necessary measures should be taken in this case and by adding and exhilarating recreation centers, healthy and safe recreations should be provided for them.
4. Classes and workshops in early years of students' education should be held for their familiarity with the culture, social and geographical environment where they are studying. In addition, in this regard, their awareness of

different ethnic groups and minorities can be effective to make students aware of their tasks in dormitory environment. In addition, it helps students in strengthening and facilitating their social relations that all of them act in line with reducing the social and cultural problems of students in university environment, especially dormitory.

5. Great attention should be paid on undergraduate students and they should be regarded as base in cultural planning and allocation of resources [8].

6. Given the importance of student house, dormitories should be designed more accurately and allocation of buildings with unrelated land use should be prevented [1].

7. According to what was said on the students' socio-cultural problems, paying attention to each student's privacy is essential in the design of dormitories.

8. Spaces for social interaction among students in dormitories are necessary.

9. The use of flexible furniture in the interior space of rooms so that students can change them according to their wishes can be effective in solving some problems such as the privacy of students

10. Paying attention to gender and educational level of students, living in dormitories, has been important in the beginning of this space design due to specific interests of each gender and academic level

11. Paying attention to desirable per capita of dormitory spaces design is also important during the designing.

12. One of the dormitory problems is lack of proper privacy in isolation of students. Such problems are in the field of environmental psychology, so understanding the issues belonging to this area has been very effective designing the dormitories (Mahmoudi Rad, 2004, pp. 45-53).

The need to examine environmental psychology in design of dormitories

In the twenty-first century, after the education of the student, dormitories were considered as the first priority at universities. These dormitories should meet the future needs and demands of students, academic developments, social life, students and their parents. Hence, designing with futuristic ideas can be practical and convenient solution to solve problems and difficult situation of today's dormitories. Dormitories not only should be suitable places for resting, but also a good opportunity to provide academic and personal growth for students. Students, parents and administrators expect that dormitories to provide appropriate private and social spaces, confidentiality and personal privacy without isolation of students with the greatest amount of flexibility. Placement of rooms, the way to deal with public space, the use of furniture and appropriate lighting technology can be appropriate tools to achieve these goals. In fact, these are cases defined in the environmental psychology with certain criteria such as privacy and personal space. These factors will affect perception, convenience, and environment quality [10].

Dormitory space per capita shortage

According to research carried out, the female student dormitory space per capita is very low and physical space of dormitories is not consistent with its use, for example, dormitory space per capita of students in the University of Medical Sciences of Hamadan is less than 8 square meters, while standard dormitory space per capita is 11 to 16 square meters.

The interior structure of the rooms

Some cases have been stated that they can have effective role in increasing the efficiency of the students in the field of studies and rest if they are observed with regard to settlement room of students.

1. Access to sufficient light is one of the most important parts of life. Student room must have at least one window study table should be near the window as possible.

2. To be away from noise sources

3. Appropriate temperature is 21 to 22 ° C. Temperatures above 26 ° C affects negatively the person focus and attention.

4. Appropriate humidity is between 30 and 65 percent.

5. Uniform ventilation of rooms with fresh air and preventing wind

6. Light color of walls and ceiling

7. Proper arrangement of study table, bed, etc. in the room so that it is better than 80 cm empty space to be considered in front of door, drawers, desk and shelves in order to easy access to interior means of room [11].

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Environmental factors

Environment and environmental factors play an important role in shaping identity and personality. For this reason, providing favorable environmental factors should be considered and serious effort should be made in this regard. In this regard, suggestions have been proposed that can play an effective role in improving living environment of students.

1.The distance between the university (monitoring managers) and dormitories should be proper. This is important in shortening the time of commuting, access to sport environments of university, using the dining hall, utilization of computer facilities and the library in university.

2. Interior plan of student house should be proportional to the morale of students.

3.In performing students home affairs, the students should be used responsibility should be given for them.

4. Sport facilities should be developed according to number of students and by considering standard per capita of physical space for each student.

5. Strengthening the disciplinary committee, decisive decision-making and caring of the relationships among the factors governing the safety and health of student houses.

6. Physical and mental health issues must be considered in student houses.

Controlling and monitoring

Compassionate monitoring of authorities on student living in student houses are very influential factors in improving the lives of them. Accordingly, recommendations have been provided discussed later.

1. Necessity of selecting compassionate and veteran staff completely restricted to the student houses

2. Providing appropriate service, performing the assigned duties properly by staff and students and avoiding of tensions

3.The controlling and monitoring of student houses without an appointment by senior managers of universities

4. Continuous control of authorities in charge of student houses and care of the relationships among students

5. Strictly observance of internal regulations of dormitory

6. Preventing non-resident individuals commuting to students house except in the presence of authorities when needed

7.Strengthening the disciplinary committee, decisive decision-making and the lack of allowance for offenders to stay there [12].

CONCLUSION

What is certain is that available dormitories do not meet the needs of living there.

This is more tangible on female student dormitories. As it is found in the comprehensive study of "Assessment of student dormitories", formation of dormitories at least for 60% of female students in non-scheduled way and creating dormitory have not been predicted in physical model of mentioned universities (Moradian, 2009, p. 90). Obviously, this situation is considered serious deficiency in management of higher education followed by many cultural works and reflections.

Current living places of students known as student dormitories have not dynamism and mobility and they are places merely for sleeping and resting and needed facilities and equipment for studying, recreating, doing exercise, and filling their free time have rarely been considered in them. Due to certain reasons, students require repeat of their family life to satisfy their mental, emotional, spiritual, and physical needs in environment. However, current situation of dormitories does not meet such needs unfortunately. Consequently, due to hardware defects and deficiencies in dormitories, there is no possible for cultural designing and planning and current restrictions have caused cultural bottlenecks. To achieve such a goal as a first step, the creation of positive and desirable mentality is required that it can be sought through creating development in words associated with specific semantic load, requirements, and expectations. Each word has its own semantic load and conceptual model that this conceptual model becomes basis of objective model, designs and different plans. Subsequently, the same designs and plans can become enacted laws and allocated resources. As a result, with the difference in words we will see difference in concepts, behavioral patterns, planning, and allocation of resources.

CONFLICT OF INTEREST
The author declares having no competing interests

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ARTICLE   **OPEN ACCESS**

INVESTIGATING KINSHIP IN PRIMARY DYSTONIA PATIENTS WITHOUT MUTATION IN DYT1 GENE IN IRAN

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ABSTRACT

Dystonia is one of the most painful diseases all over the world and it is debilitating too. Distribution of the disease is reported as 1 in 9000 of Ashkenazi Jews and 1in 16000 of non-Jews. There are some reports about the disease from different countries all over the world. Most of the reports are from pathological studies and genetic investigations in this disease have been limited to finding the limitation place.

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INTRODUCTION

Dystonia is a disease which occurs due to pathological damage of muscles and leads to involuntary motions and paralysis [1]. A heterogeneous group of disorders with different reasons causes incidence of the disease. Dystonia is mostly accompanied by muscle contraction with repetitive spiral movements and abnormal contractions [2]. This disease is divided based on cause, beginning age and body distribution. It can be more divided to genetic and non-genetic groups based on the cause [3].

Dystonia is divided into several group according to the origin, onset age and body distribution [4].
On the basis of the origin, this disease is categorized into genetic and non-genetic groups [5].
The genetic group of Dystonia is also called Dystonia type I or first Dystonia [4,6]. The non-genetic group of Dystonia is also called Dystonia type II or second Dystonia [7].

Dystonia is classified according to onset age into early and late classes [8,9].The symptoms of early onset dystonia begin from childhood that usually presented as generalized, while that late onset dystonia occurs during adolescence in which head and neck usually involved(10).

Body distribution of dystonia can be exisested as focal, local or generalized [11]. The symptoms of focal type presented in the 4-5th decade of the life and some of muscles were usually affected [12]. The generalized type of Dystonia started in the in the age less than 5 years and involved the most of muscles. It is the most inheritable type of Dystonia [13].

The average onset age is 12.5 year and almost occurs before the age of 28 in every affected individual. It appear as a focal dystonia and then distributed from hands or feet to over the body [14].

Genealogy of the DYT1 patients
Among The patients without mutation in DYT1 gene in Iran

28,98% of the patients (20 people) were children of family marriages.45% of them (9 people) had parents with third degree kinship and 105 of them had parents with far kinship. Age range of them had ben from birth to 48 years old. 45% of the patients (9 people) had general distribution type, 255 (5 people) had multi focal type, 5% (1 people) had writhing cramp, 5% (one person) had focal type and 20% (4 people) had segmental type. Patients

BIOTECHNOLOGY

with hemi-dystonia type didn't have family relationship. Beginning of the disease in most of the patients had been from right side. In 45% of them it has begun form hand, 25% from leg (5 people), 20% (4 people) from face. The diagram of body distribution in patients with family relationship has drown in **[Figure- 1].**
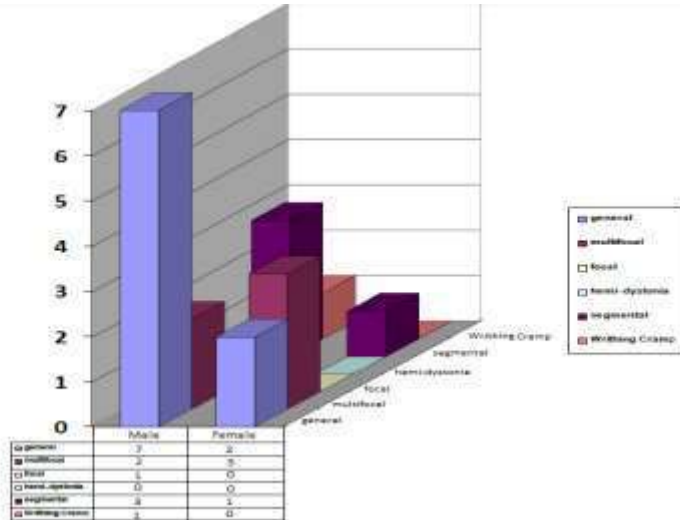

Fig: 1. Body distribution in patients with family relationship

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Kinship in General type patients

From among general type patients, nine of them had family relationship which six of them are male and three are female. Two male and a female had third degree kinship and others have far relationship . From among these patients three of them had beginning age of zero to four years old and three of them had beginning age of four to eight years old, three of them were over eight at the beginning of the disease **[Figure-2]**.
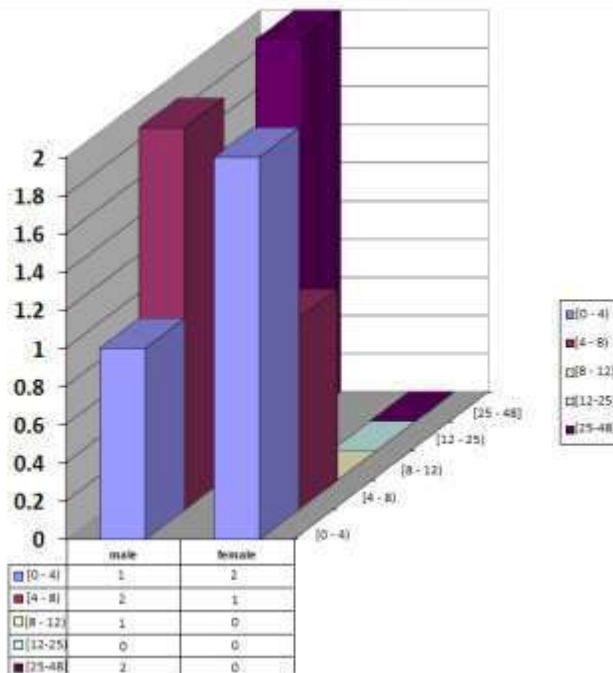
Fig:2. Family relationship in general type patients

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Patients of Dystonia Family relationship in Multi focal patients

From among multi focal patients five of them had family relationship. Two of them are male and three of them are female. One male and two female had third degree family relationship and others have far relationship . Among these patients no beginning age from zero to four years old has been seen. One of them had the beginning age of four to eight and four of them had beginning age of over eight years old **[Figure-3]**.
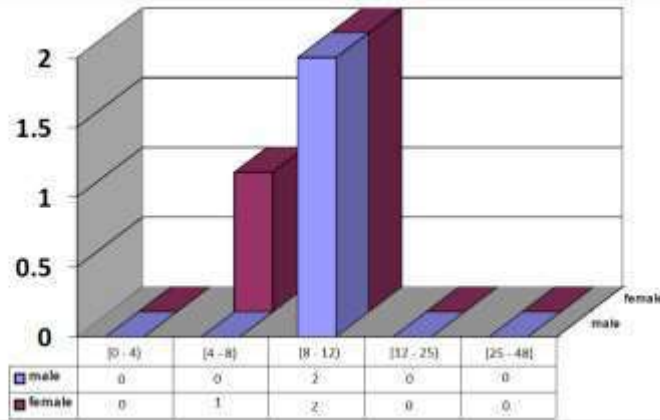
Fig: 3. Family relationship in multi-focal patients

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Family relationship in multi focal patients
From among focal type one person (one male) had family relationship with third degree relationship and incidence age is high .

Family relationship in segmental patients
 From among segmental type patients four of them had family relationship. Three of them are male and one of them is female. Family relationships were third degree relationship and all had far family relationship. From among the patients one of them had the beginning age of zero to four years old and three of them had over eight years old age **[Figure-4]**.

Fig: 4. Investigating family relationship in segmental type patients

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Family relationship in writhing cramp patients
Only writhing cramp patients show third degree family relationship .

CONFLICT OF INTEREST
The author declares having no competing interests.

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None

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ANALYSIS OF A SPEED CONTROL SYSTEM OF INDUCTION MOTOR FED BY A Z-SOURCE INVERTER BASED ON V/F SCALAR CONTROL

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ABSTRACT

This paper proposes a closed loop speed control of an induction motor fed by a Z-source inverter (ZSI), the speed control is based on V/F scalar control. ZSI is a one-stage power conditioner that employs a capacitor-inductor network for connecting inverter to the DC source. In this paper, through addressing detailed dynamic modeling of ZSI , ZSI is used for connecting the DC source to a induction motor. A closed loop controller is designed to control the peak dc link voltage of the ZSI, where the peak dc-link voltage is estimated by measuring the input and the capacitor voltages. By using the dynamic model of ZSI, the proper controller for the DC side is designed. The proposed speed control system compared with the standard adjustable speed drives (ASD), are able to change the motor speed from zero to the rated speed with the rated load torque. Also the ZSI inverter system provides ride-through capability during voltage sags, reduces line harmonics, improves power factor and reliability, and extends output voltage range. Simulation results are provided to demonstrate the competence of the system.

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INTRODUCTION

Induction motors have many advantages compared to DC motors and synchronous motors in many aspects, such as size, efficiency, cost, life span and maintainability. Low cost and ease of manufacturing have made the induction motors a good choice for electric and hybrid vehicles [1]. However, one must be able to achieve energy regenerative braking and be able to control the torque and the speed of an induction motor in traction drives such as hybrid electric vehicles [2]. The application of adjustable-speed drives (ASD's) in commercial and industrial facilities is increasing due to improved efficiency, energy savings, and process control. The traditional adjustable-speed drives system is based on the voltage-source inverter, which consists of a diode rectifier frond end, dc link capacitor, and inverter bridge. It suffers some common limitations and problems. 1) Obtainable output is limited quite below the input line voltage, 2) Voltage sags can interrupt an ASD system and shut down critical loads and processes; 3) Performance and reliability are compromised by V-source inverter structure[3].

Z-source inverter (ZSI) is known as a single-stage buck/boost inverter [4]. **[Figure- 1]** shows the general structure of Z-source Inverter. With an impedance network coupling the inverter main circuit to the dc source, the ZSI achieves voltage buck/boost in one stage, without introduce more switching devices. Shoot-through state enables energy to be stored in inductors, which is released when at non-shoot-through state, followed by the voltage boost feature. For the voltage-fed type ZSI (abbreviated as ZSI), voltage boost methods based on pulse-width modulation have been firstly investigated as simple boost control, maximum boost control and maximum constant boost control [5, 6]. Because of its single-stage voltage buck/boost properties, the ZSI can deal with input voltage fluctuation in a wide range, which is conventionally achieved by a two-stage DC-DC cascaded by DC-AC structure.
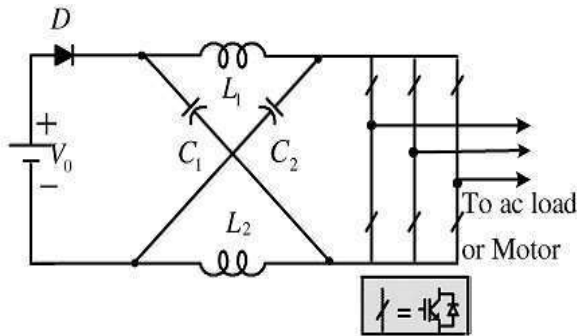
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Fig:1. General structure of the ZSI

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The volts per hertz (V/F) induction motor drives with inverters are widely used in a number of industrial applications leading not only to energy saving, but also to improvement in productivity and quality. The low cost applications usually adopt V/F scalar control when no particular performance is required. Variable speed pumps, fans and appliances are the examples. Furthermore, these applications usually do not require zero speed operation. The main advantage of V/F control is its simplicity and for this reason it has been traditionally implemented using low cost microcontrollers [7].

This paper presents V/F control based closed loop speed control of a three phase induction motor fed by ZSI. The dynamic model of the asymmetric Z-source network is constructed by small signal analysis. The peak dc link voltage is estimated by measuring the input and the capacitor voltages. A closed loop controller is designed based on the dynamic model of the ZSI for controlling the peak dc link voltage. MATLAB Simulation results are included to prove the concept and demonstrate the features of the proposed ASD system.

Dynamic Modeling of Z-Source Network

Fig. 2 shows the general structure of the voltage-fed type Z-source network. .Since there is inductor L_1 at the input of the two-port impedance network, the input current of the Z-Source network is continuous. The employed Z-source network couples the converter to the voltage source, load, or another converter. The voltage source can be one or a combination of follows: a battery, photovoltaic panel, fuel cell, diode rectifier, a capacitor or an ac voltage source, etc. Switches involved in the Z-Source network can be unidirectional for single- direction power flow or bidirectional for dual-direction power flow. For the output of the ZSI, there can be passive load or source, either in dc or ac form, which is commonly coupled by the smooth inductor [8].

The buck operation is normally accomplished by conventional switch of the converter, where S_2 is equivalently OFF and S_1 is ON. Taking a voltage-fed Z-Source network as an example, the OFF state of S_2 implies none of the inverter phase legs is shorted. In steady state we have The output voltage of Z-Source network depends on the switching duty cycle of the conventional converter. The boost operation can be achieved by introducing shoot-through states into switch S_2,e.g. S_2 is ON in a short interval T_0 of one switch duty cycle T_s. Accordingly switch S_1 is OFF either due to the circuit (for example a diode is used as S_1) or active control. By defining the shoot-through duty ratio $d_0=T_0/T_s$, we have following voltage equations of the Z-Source network in steady state:

$$v_{C1} = v_{C2} = \frac{1-d_0}{1-2d_0} v_{in} \qquad (1)$$

$$\hat{v}_s = v_{C1} + v_{C2} = \frac{1}{1-2d_0} v_{in} = B v_{in} \qquad (3)$$

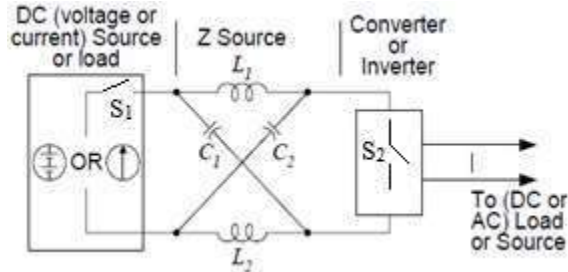where$\hat{v}_s$ is the peak voltage of the Z-Source network output; and B is defined as the voltage boost factor.

Fig:2. Structure of the voltage-fed type Z-source network

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When operating at shoot-through states, the ac load terminals are shorted through both upper and lower devices of any phase leg(s); therefore the single switch is ON and the equivalent circuit of the ZSI is shown as **[Figure- 3]**. When operating at non-shoot-through states (i.e. six active states and two conventional zero states where either all the upper devices or all the lower devices are gated on) the single switch is OFF and the equivalent circuit of the ZSI is shown as **[Figure- 4]**.. Considering the asymmetric Z-source network, there are four state variables: the current through two inductors i_{L1}, i_{L2}; the voltage across the capacitors v_{C1}, v_{C2}. For general analysis purpose, input voltage v_{in} is chosen as system input, to which input current i_{in} is related. The relationship of v_{in} and i_{in} will be determined by specified energy source nature. Independent load current i_{laod} serves as another input (disturbance) of the quasi-Z-source network. Choose v_{C1} and i_{L1} $(= i_{in})$ as the output of the studied system. For simplification, assume that $C = C_1 = C_2$, $L = L_1 = L_2$, the stray resistances of inductors $r = r_1 = r_2$, the equivalent series resistances (ESR) of capacitors $R = R_1 = R_2$.
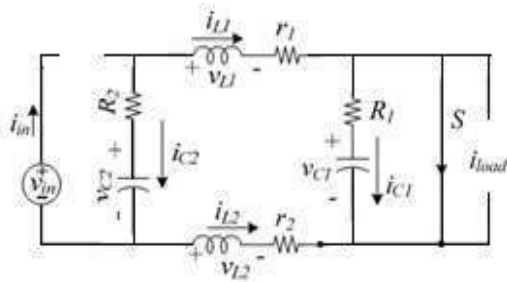

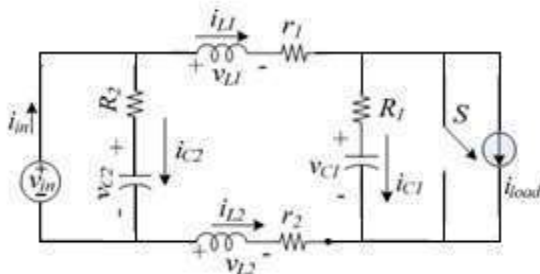**Fig:3.: Equivalent circuit of quasi Z-source network when in the shoot-through**

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Fig:.4. Equivalent circuit of quasi Z-source network when in the non-shoot-through states

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To obtain the small signal model of ZSI, it is necessary to write the dynamic state equations of ZSI in both shoot-through and non-shoot-through states separately. By using state space averaging and applying perturbation to dynamic state variables, the Z-source network small signal dynamics can be model. Eventually the Laplace-transformed transfer functions of the multi-input multi-output Z-source network can be derived. Assuming any two of the system inputs to be zero, one can get small signal transfer functions from the remaining to the state variables. According to the small-signal model, the transfer functions from d_0 *to* capacitor voltage v_{C1} and v_{C2} are identical, denoted as $\mathbf{G_{d_0}^{vc}}$ **(s)** in (4), where V_C, I_L, I_{load} and D_0 are presented an operating point.

$$G_{d_0}^{v_C}(s) = \frac{(2V_C - V_{in} - RI_{load})(1 - 2D_0) + (I_{load} - 2I_L)(Ls + R + r)}{LCs^2 + C(r + R)s + (1 - 2D_0)^2}$$

Also The transfer functions from d_0 to inductor current i_{L1} and i_{L2} are identical, denoted as $G_{d_0}^{i_L}(s)$ in (5).

$$G_{d_0}^{i_L}(s) = \frac{(2V_C - V_{in} - RI_{load})Cs - (I_{load} - 2I_L)(1 - 2D_0)}{LCs^2 + C(r + R)s + (1 - 2D_0)^2}$$
$$(5)$$

Controller Design for Closed
Loop V/F Controlled Induction Motor

A simplified diagram of the V/F controlled induction motor is shown in **[Figure- 5]**. The closed loop control by slip regulation of the combined inverter induction motor improves the dynamic performance. The speed loop error generates the slip command ω_{sl}^* through a proportional integral (PI) controller and a limiter. The slip is added to the speed feedback signal to generate the slip frequency command ω_e^*. Thus the frequency command generates the voltage command through a Volts/Hz generator [7].

The shoot through duty cycle d_0 and modulation index M are generated by dc side and ac side controllers of ZSI. Control of dc side and ac side of the ZSI is executed separately. **[Figure- 6]** shows the control scheme of dc side of the ZSI. Pulses generated by the dc-side controller (for voltage boost or buck) and the ac side controller (for dc-ac conversion) are combined together by logical 'OR' to fire six IGBTs, assuming '1' is ON and '0' is OFF.
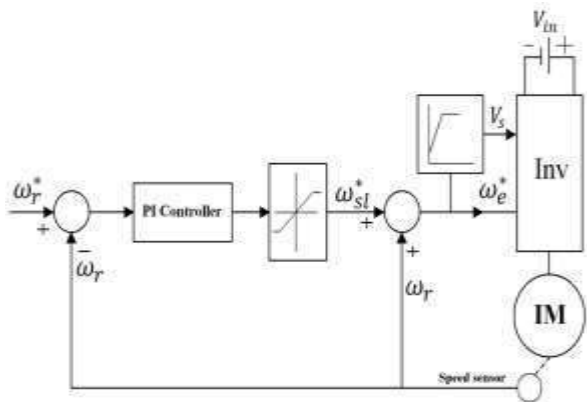

Fig:5. V/F based closed loop speed control scheme of an induction motor

Proportional-integral (PI) controller assisted with a feed forward d_0 is used as the shoot-through compensator. Capacitor voltage v_{C1} is measured and fed back. Laplace-transformed transfer functions of the Z-source network can be obtained via (5). The feed forward d_0 is determined according to the inherent relationship of v_{C1} and v_{in} in steady state:
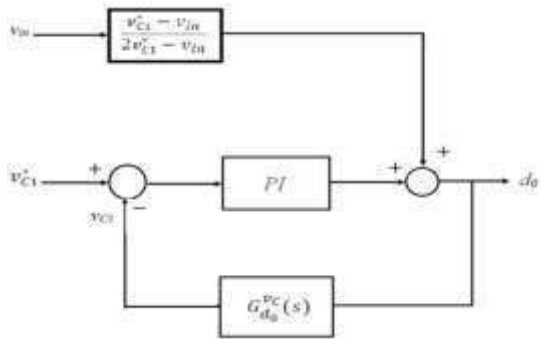
$$d_0 = \frac{v_{C1}^* - v_{in}}{2v_{C1}^* - v_{in}} \qquad (6)$$

Fig. 6: DC voltage control block diagram of a ZSI

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In order to prevent the clashes between the dynamics of ac- and dc-sides, the dc-side dynamics should be made considerably slower. By doing so, the ac output can be regulated quickly with a relative stable dc voltage to avoid interactive oscillation between the dc and ac side. This could be supported by having a relatively lower bandwidth in the dc-side voltage loop. However, fast response of the dc-side controller is still necessary for good performance of the whole system. With the system specifications listed in [**Table- 1**], bode plot of the dc-side controller can be obtained. As shown in [**Figure- 7**], with k_p = 2e-4, k_i = 0.4, the crossover frequency is set to 32 Hz.

TABLE I: Z-source Inverter Parameters

Parameter	value	Unit
C	400	μF
L	500	μH
R	0.47	Ω
r	0.03	Ω
V_{in}	130	V
D_0	0.25	-
I_{load}	10	A
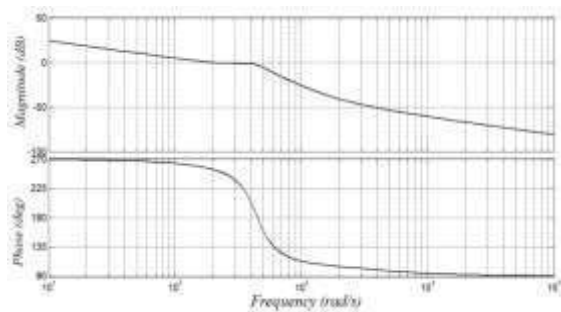
Fig:7. Frequency response of voltage loop gain

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MATERIALS AND METHODS

Simulation Results

The standard mode of operation of an ASD is to maintain the DC link voltage at a constant value and adjust the modulation index M to control the output voltage. As described in [2], the modulation index M plays an important role on the motor iron losses and the ripple current below base speed. As a consequence, in order to reduce the iron losses it is better to operate with the highest allowed modulation index.

In order to verify the proposed closed loop speed control and peak dc-link voltage control strategies, several simulations are carried out using MATLAB/SIMULINK for a sample induction motor using the parameters in Table II. The specifications of Z-source network used in simulation are presented in Table III. In the simulation model, the constant boost PWM control method is used and the modulation index is calculated from the reference voltage in V/F control method.

In the proposed closed loop Z-source inverter ASD system, in order to make the inverter operate with higher modulation index, the dc link voltage is controlled to be constant by the closed loop shoot-through control. The modulation index is calculated by the V/F control with variable operating frequency.

TABLE 2. Induction Motor Parameters

Parameter	value	Unit
Output power	7	hp
RMS line voltage	400	V
Input frequency	60	Hz
Numbers of poles	4	-
Stator resistance, R_s	0.8	Ω
Rotor resistance, R_r'	0.6	Ω
Stator inductance, L_{ls}	5.974	mH
Rotor inductance, L_{lr}'	5.974	mH
Mutual inductance, L_m	20.37	mH
Inertia, J	0.02	$kg.m^2$
Fraction Factor, F	0.005752	N.m.s

TABLE: 3. Quasi Z-source network Parameters

| Parameter	alue	nit
Capacitor	400	μF
Inductance	500	μH
DC input voltage	513	V
AC output RMS line voltage	400	V
Switching frequency	10	kHz

RESULTS

In order to investigate the ability of the proposed control system, the simulation was performed in two cases .At the first case, it is assumed the speed command is increased from 800 rpm to 1000 rpm. The simulation results in this case are shown in **[Figure- 9]**.   At the second case, the load torque is increased from 10 N.m to 15 N.m**[Figure- 10]** shows the simulation results in this case.
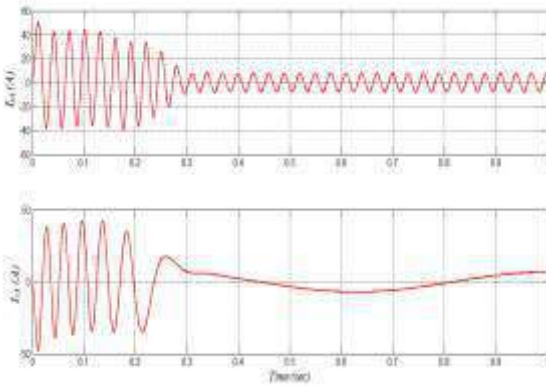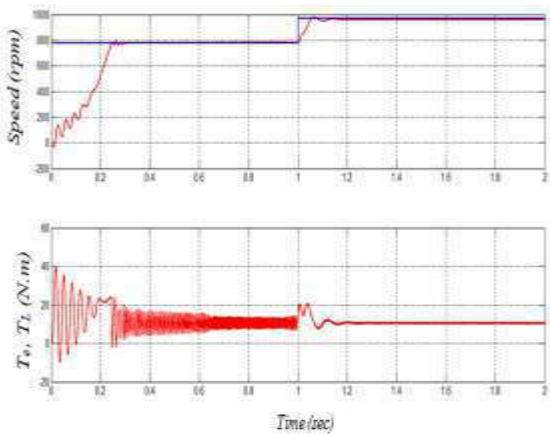 The simulation results in both cases verify the validity of the proposed close loop control system.

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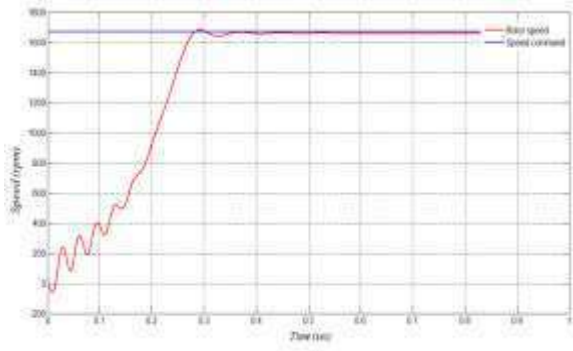
(a)
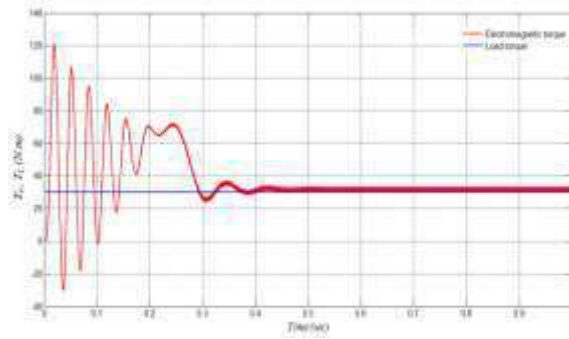
(b)

(c)

Fig. 8: System response during start up, a) motor speed, b) electromagnetic and load torque, c) stator and rotor current

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Fig. 9: System response during speed command increase

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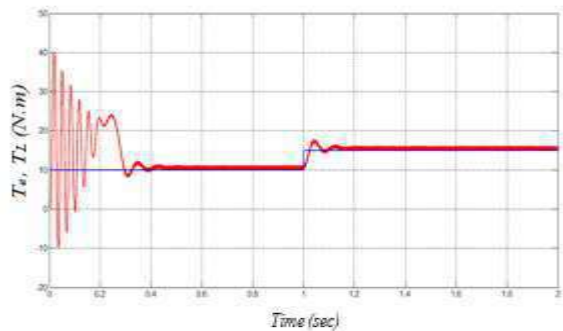
Fig. 10: System response during load torque increase

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DISCUSSION

In this paper a new closed loop speed control of induction motor fed by Z-source inverter based on V/F control has been proposed. The unique features of ZSI cause the proposed system has many advantages compared with traditional speed control system fed by voltage source inverters. The dc link voltage is controlled by a proposed closed loop controller. The controller parameters of dc side has been determined by using the dynamic model of ZSI. The simulation results verified the ability of the proposed closed loop speed control system during start up, load disturbance and changing of speed command.

CONFLICT OF INTEREST
The author declares having no competing interests.

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ENGINEERING

ARTICLE   OPEN ACCESS

ANALYZING THE EFFECT OF CUSTOMERS' SATISFACTION ON ORGANIZATIONAL PERFORMANCE IN PROCUREMENT MANAGEMENT AND GOODS AFFAIRS OF NATIONAL IRANIAN SOUTH OILFIELDS COMPANY – AHVAZ

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ABSTRACT

Customer satisfaction is encountered one of the most important duties and priorities of companies' management by management experts and they have taken account the need for stable and permanent obligation of top managers to customer satisfaction as the main precondition of success. Therefore; this study has been done with the aim of analyzing the effect of customer satisfaction on organizational performance. Statistical population of the research consists of 600 people of experts and managers of goods unit procurement management of Ahvaz south oilfields, and 234 of them were selected as a sample by using Krejcie& Morgan table and simple randomly sampling method. The present research method is considered applicable based on objective, and in terms of the way of collecting data is considered descriptive research and in terms of relationship between research variables is considered causative and specifically is based on structural equation modeling. In order to measure variables of research the questionnaire (customer satisfaction and organizational performance) and statistical analysis methods have been applied by using SPSS.18 and LISREL.8.5 software. The results of questionnaire analysis indicated that customer satisfaction (and its magnitude) has positive and significant effect on organizational performance.

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INTRODUCTION

One of the major changes was taken place in the last decade of the twentieth century for improvement of organizational performance, was recognition ofcustomer satisfaction measurement as one of the main requirements and elements of management systems in organizations.A lot of efforts have been taken place today to improve performance tools and expand the customer-oriented attitude by researchers, experts and managers of commercial organizations indicates that customer satisfaction is considered now as one of the most important factors in determining the success of organizations in business and profitability affair. Customer satisfaction is encountered as one of the most important duties and priorities of companies' management by management experts and they have taken account the need for stable and permanent obligation of top managers for customer satisfaction as a main precondition of success.One of the important requirements in the development of organizations and companies is that to place customer and his satisfaction in priority of their objectives and activities. Full recognition of customer,give him or her priority, offering quality services are considered as the success guarantee factors in today's business market. Therefore, creating and implementing systems for measuring and surveillance of customer satisfaction are considered the basic needs of today's organizations as the most important factor for improving performance of organizations[1]. Customer: customer is a natural or legal person we offer to him or her goods and services directly and indirectly. Satisfaction: satisfaction can be achieved by our different understanding between customer expectations and actual performance of product or organization. [1], defined customer satisfaction as a degree to provide actual performance of a company and customer expectations. In Katler's view if performance of company provide customer's expectations, customer have a sense of satisfaction otherwise he will be given dissatisfaction[2]. [3]define customer satisfaction as a feeling or attitude of a customer to a product or services after using it.The two researchers state that customer satisfaction is the main result of marketing activityacts as a relationship between different stages of consumer purchase behavior. For example, if customers are satisfied by special services, they will more probably repeat their purchase. Satisfied customersprobably talk to others about

their experiences, consequently they are engaged to positive word of mouth (oral-verbal) advertising.In contrast, unhappy customers will probably cut their ties with the company and will engage in negative word of mouth advertising.In addition, behaviors such as purchase repetition and word of mouth advertising directly affect a company's survival and profitability.Customer satisfaction is the result of the customer's perception during a deal or valuable relationshipso that the price is equal to the ratio of quality of done services to price and costs of customer. The followingdefinition of customer satisfaction is accepted by many of experts: Customer satisfaction is a result obtained from customer pre-purchase comparison of expected performance with real-perceived performance and the cost which is paid. By looking at the views of customers' satisfaction we find out at least twentydefinitions about satisfaction have been presented by social sciences researchers and psychology researchers during last thirty years that here are three main factors in all these definitionsand it can provide a basis for a comprehensive definition of satisfaction.These factors include:

1-Customer satisfaction is a feeling reaction (emotional) or a state of mutual understanding and recognition.

 2- Customer satisfaction is a response to specific focus on the expectations of production and

experience to use of services or consumption and the like.

3- Customer satisfaction is a reaction that occurs in a period of time.For example, after the first selection or on the basis of successive and accumulated experiences and so on and so forth.

Another group of open-minded researchers believe that customer satisfaction doesn't only refer to their expectations, but rather it is important to pay attention to his or her needs especially basic needs, such as safety requirements, respect and justice. Because needs are defer from expectations. Expectations are awareness, specific, short-term andsuperficial; while needs is unawareness, general, deep and long-term as long as they have not been achieved. When expectations are not met, he will becomedespair and dissatisfy, but when the basic requirements are not provided he will tend to become angry or even become exasperated. If the customer is not satisfied he will not be happy, but if you do not provide his needs you will lose him. Therefore, customer satisfaction means: full supply of needs, and his demands just at the same time and the same way that he wants. In the view of organizations, customer satisfaction is the result of a three-part system which includes: performances (processes) of institute; the employees of institute who are provider of product or service; customer expectations.The effectiveness of this three-part systemdepended on the appropriate integration of these parts with each other.Common area among these three parts indicates the customer satisfaction [3]. In spite of widespread recognition of the importance of customer satisfaction for long-term success of the organization, whether this variable could have an impact on organizational performance or not has not widely been discussed in the literature related to these issues. To investigate these issues, we have to answer the fundamental question:

1- What is the effect of customer satisfaction on organizational performance?

MATERIALS AND METHODS

Theoretical framework of research

In this part of paper the literature review and history of research about customers' satisfaction and organizational performance will be discussed.

Customers' satisfaction

Customer satisfaction is known as one of the main obligations of management systems in all institutions, therefore; the majority of efforts are being done todayin order to promote and development of customer-oriented culture by researchers, experts and managers of organizations, all indicate now that customer satisfaction in everyone's opinion is considered as the most important factors in determining the success of organizations, even in organizations with monopoly nature because the lack of competition,the realization to focus on customer has attracted the attention of the managers of these organizations.Evaluation and identification of customer satisfaction and measuring customers' satisfaction is important for the reason that finally the level of customer satisfaction determines the success or failure of organizations.If performance of organization is always lower than customer expectations, customers will depart from organization and organization finally go to bankruptcy, subsequently the organizations that have higher levels of customer satisfaction, are always stronger and more successful in the long term, the best return on investment are customers.Customer satisfaction is one of the basic concepts of evaluation being followed by many businesses;customers' satisfaction is measured regularly and periodically after any structural changes [3]. In relation to the concept of customer satisfaction, various definitions have been proposed by theorists of marketing. [4], defines customer satisfaction as a degree to provide actual performance of a company and customer expectations. In Katler's view if performance of company provide customer's expectations, customers have sense of satisfaction otherwise they will be given dissatisfaction. define customer satisfaction as a feeling or attitude of a customer to a product or services after using it. The two researchers state that customer satisfaction is the main result of marketing activity, acts as a relationship between different stages of consumer

purchase behavior. For example, if customers are satisfied by special services, they will more probably repeat their purchase. Satisfied customers probably talk with others about their experiences as well; consequently they are engaged to positive word of mouth (oral-verbal) advertising. In contrast, dissatisfied customers will probably cut their ties with the company and will engage in negative word of mouth advertising. In addition, behaviors such as purchase repetition and word of mouth advertising directly affect the survival and profitability of a company. [4] believe that: customer satisfaction is the result of the customer's perception during a deal or valuable relationship so that the price is equal to the ratio of quality of services to price and costs of customer.To measure customer satisfaction in the service sector, several models have been proposed. One of the most popular and most practical of these models is "Sevqual" model was proposed by American scientists, "Parasuraman", "Zeithaml" and "Berry" in 1980 and then it has been modified. This model has five dimensions: reliability, responsiveness,assurance,empathy and tangibles.This model has been used to analyzing the customers' satisfaction in many organizations and industries and its reliability has been confirmed [4].

1- Reliability: the ability to perform the promised service to customer in accurate, reliable and continuous manner.

2- Responsiveness: the willingness to help customers and providing prompt timely services.

3- Assurance: this index indicates the ability and competence of personnel to convey a sense of trust and confidence to customer service.

4- Empathy:this index means the provision of caring, individualized attention to customers.

5- Tangibles: this index includes all equipment, facilities, public space of organization, appearance of employees and finally communication materials.

Organizational performance

Today's world especially organizations' world, is changing continuously and tremendously and all aspects of the organizations from internal environment to external environment, from human to non-human factors, etc. are changing all from one state to another with eye catching acceleration. Performance is one of the most important structures being discussed in management researches and undoubtedly is considered as the most important measure criterion of success in commercial companies. Performance is a wide concept that embraces whatever produced by company as well as the areas are interacted with them [5]. In most organizations in the world managers and organizational leaders are always seeking for improve and betterment of their organizations' performance. Organization's performance is a wide combination of both nontangible reception, such as increasing organizational knowledge, and tangible and objective receptions such as financial and economic outcomes [6]. Performance literary means situation or quality of function, therefore; organizational performance is a general structure refers to the way that organizational operation work [7]. The most famous definition of performance proposed by [7]: "explanation process of quality and efficiency of past actions". Based on this definition, performance is divided into two components: 1) efficiency that describes the way of using resources by organization in manufacturing the services or productions, it means the relationship between the real and ideal combination of inputs to produce specific outputs; and 2) effectiveness that describes the degree to achieve organizational goals.

Research model and hypotheses

[Figure–2]shows the conceptual model of research proposed based on theoretical principles. This model shows the impact of customer satisfaction on organizational performance **[Figure–1]**.
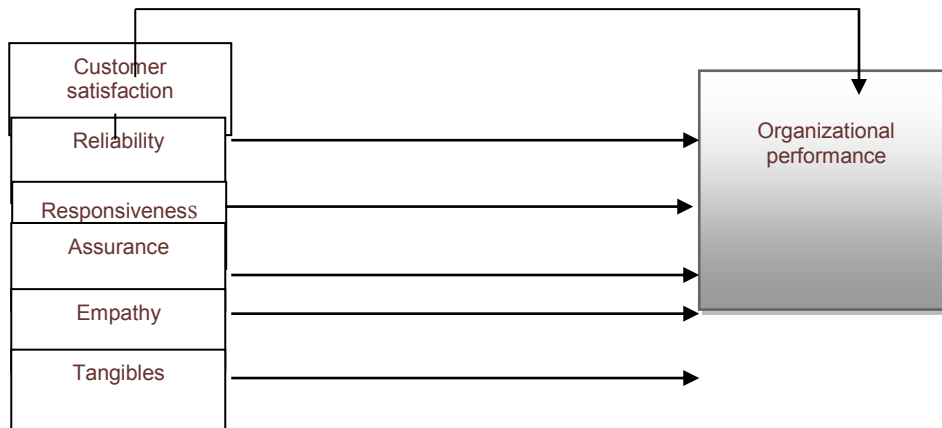

Fig: 2. conceptual model of research (it has been made)

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Research Hypotheses

Customers' satisfaction has positive and significant effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company–Ahvaz.

Subhypotheses

Subhupothesis1: Reliability has positive and significant effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company–Ahvaz.

Subhupothesis 2: Responsiveness has positive and significant effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company–Ahvaz.

Subhupothesis 3: Assurance has positive and significant effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company–Ahvaz

Subhupothesis 4: Empathy has positive and significant effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company–Ahvaz.

Subhupothesis 5: Tangibles has positive and significant effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company–Ahvaz

Research Method

The present research is based on applied objective, an in term of the way of collecting data is considered as descriptive researches, and in terms of the relation between research variables is a kind of causative research. Statistical population of the research consists of 600 people of experts and managers of procurement management of goods unit of south oilfields- Ahvaz; by using Krejcie and Morgan table,simple randomly sampling method, 234 of them were selected as a sample.In order to measure customer satisfaction and organizational performance, standard questionnaire, [8]were respectively applied. 305 questionnaires were distributed totally and 290 valid questionnaires were collected from respondents.The questions of questionnaire are divided into two categories of general and specialized questions; that are based on five-point Likert scale (very low, low, medium, high and very high).In order to determine the reliability of mentioned questionnaires, Cronbach's alpha method was also applied by using statistical software SPSS.18. In **[Table–1]** the number of items offered for measuring every variable and Cronbach's alpha coefficient for each variable has been determined**[Table–1]**.

Table: 1. Explanation of variable, dimensions and instrument reliability of research measurement

Variable	Reliability coefficient	Number of items
Customers' satisfaction	0/799	2 2
Organizational performance	0/907	6

As is shown in above **[Table-1]**, Cronbach's alpha coefficient indicates reliability and validity of research tools. In order to test the validity of questions two content validity and factorial validity were used as well. To test the validity of the questionnaire contentthe opinions of some specialists, academics' professors and experts were used;and finally we were assured that the questionnaire measures the same characteristics of researchers. Factorial validity test of questionnaire was also done by confirmatory factor analysis and by using LISREL software.Looking at the results of LISREL in **[Table–3]**we observe thatboth measuring models provide the mentioned conditions and are appropriate models. These results totally indicate the proper reliability and validity of questionnaires of the research.

RESULTS ANS DISCUSSION

Description of sample demographic

84.9% of respondents were men and 15.1 percent of them were women. The maximum percentage of respondents was experts with 91.6 percent.20.9 percent of respondents are fallen in the group with 25 to 40 years old, 53.8 percent of respondents in the group with 41 to 50 years old and finally 25.3 percent of respondents in the group with 51 and over years old.The largest number of respondents is respondents with a bachelor's degree (40.9 percent).The largest number of respondents is employees from 21 to 30 years of service (33.8%)**[Table–2]**.

Table: 2. Descriptive findings of variables of interest

variable	Average	Standard deviation	T-Test Significant	Confidence interval of difference %95	
				Lower	Higher
Reliability	3.1627	.63754	.000	.0789	.2464
Responsiveness	3.3233	.76595	.000	.2227	.4240
Assurance	3.0722	.72199	.135	-.0226	.1671
Empathy	3.1911	.79435	.000	.0868	.2955
Tangibles	4.0300	.79123	.000	.9261	1.1339
Customer satisfaction	3.3559	.43926	.000	.2982	.4136
Organizational performance	3.2274	.80949	.000	.1211	.3338

As shown in **[Table- 2]**, given to scale which is five-point Likert scale and the average is number of 3 and also t-test significance in all cases, it was cleared that acquired average of variables of interest and its dimensions is greater than number 3. There is only assurance dimension with mean condition in this **[Table- 2]**.

Analyzing measurement models

In this part of the paper the results of confirmatory factor analysis of measuring models and also the result of research hypotheses test will be discussed by using LISREL statistical software.It is necessary to ensure the accuracy of measurement modelsin structural equation modeling. Therefore, following the results of confirmatory factor analysis, measurement models of research variables are provided**[Table- 3]**.

Table: 3. Comparison of measurement models

measurement model	confirmatory factorial analysis type	χ^2	Df	χ^2/df	p-value	RMSEA	GFI	AGFI
customer satisfaction model	second time	230.53	204	1.12	0/09800	0.024	0/91	0/90
organizational performance model	first time	32.75	19	1.68	0/0015	0.039	0/95	0/90

As shown in **[Table -3]**, the results of confirmatory factor analysis of measurement models of customer satisfaction and organizational performance indicate that the main indexes of all latent variables fitness are placed in an appropriate and acceptable scope. In other words conceptual models of research are in accordance with the observed data to a large extent.

Results from research hypotheses test

After to do confirmatory factorial analysis and identification of latent variables,in this part we will test the research hypotheses by doing appropriate analysis. To do hypotheses test the structural equation model and Lisrel software has been used. For implementing the structural equation model to test the main hypothesis of research at first output of software indicates the suitability of the fitted structural model (χ^2/df=1/84; RMSEA=0/046; GFI=0/92; AGFI=0/91; NFI=0/96; NNFI=0/98; CFI=0/98). In other words, observed data is in accordance with the research conceptual model to a large extent. **[Figure–2]**
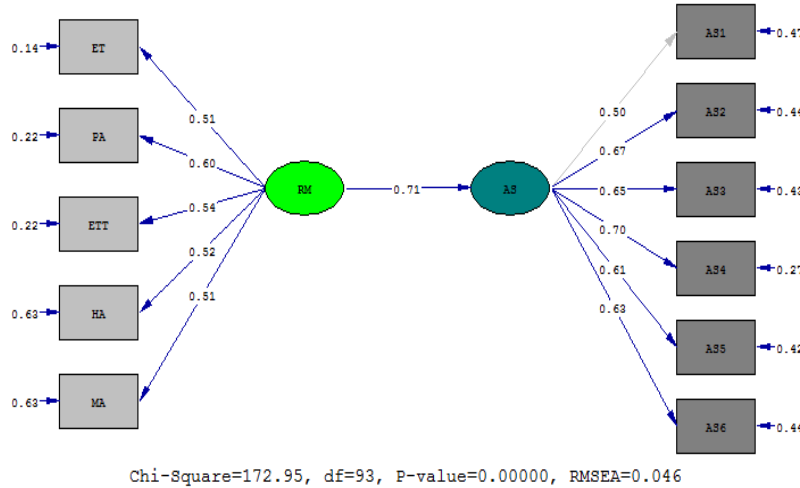
Chi-Square=172.95, df=93, P-value=0.00000, RMSEA=0.046

Fig: 2. Structural model of research to test main hypothesis in the state of standard estimate

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In **[Figure-2]** significant coefficients and parameters obtained from research structural model have been shown as well**[Figure–3]**.

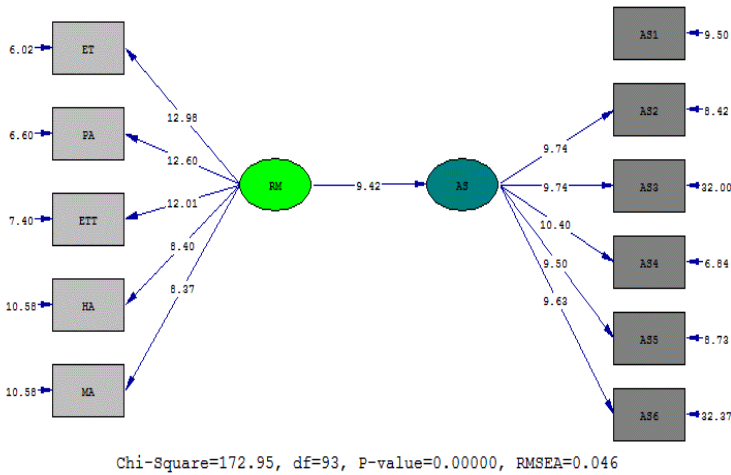Chi-Square=172.95, df=93, P-value=0.00000, RMSEA=0.046

Fig: 3. Significant numbers of research structural model coefficients for testing main hypothesis

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The results of structural equations model show that customer satisfaction has effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company−Ahvaz. (t=9.42; β=0.71). Therefore, the null hypothesis is rejected and main hypothesis is confirmed.

Results of sub hypotheses test

To do the structural equation model for sub hypotheses test of research at first output of software also indicates the suitability of the fitted structural model ($\Box\Box\Box$df =1/37; RMSEA=0/41; GFI=0/92; AGFI=0/90; NFI=0/95; NNFI=0/97; CFI=0/98). In other words, observed data is in accordance with conceptual model of research to a large extent **[Table–4]**.

Table: 4. Results of sub hypotheses test

Hypothesis	Independent variable	Dependent variable	Path coefficient	Significance number	Test result
Mainhypothesis	Customer satisfaction	Organizational	0/71	9.42	It was

			performance			confirmed
Subhypothesis1	Reliability	Organizational performance	0/61	8.14		It was confirmed
Subhypothesis 2	Responsiveness	Organizational performance	0/73	9.28		It was confirmed
Subhypothesis 3	Assurance	Organizational performance	0/68	8.15		It was confirmed
Subhypothesis 4	Empathy	Organizational performance	0/93	9.37		It was confirmed
Subhypothesis 5	Tangibles	Organizational performance	0/52	7.00		It was confirmed

The results of structural equations model show that dimensions of reliability (with effect coefficient 0.61), responsiveness (with effect coefficient 0.73), assurance (with effect coefficient 0.68), empathy (with effect coefficient 0.93) and tangibles (with effect coefficient 0.52) have effect on organizational performance in procurement management and goods affairs of national Iranian south oilfields company−Ahvaz. Therefore, null hypothesis is rejected and all hypotheses of research are confirmed.

CONCLUSION

This research has been analyzed the effect of customers' satisfaction on organizational performance by using Sevqual model framework.

The results from structural relations among research variables are shown in table 4 and diagram 1&2.
−Findings of research indicate the confirmation of main hypothesis with path coefficient 0/71 and significance number 9/42. Given that t-statistic is equal to 9.42 and is greater than 1.96 therefore, customers' satisfaction has significant effect on organizational performance. On the other hand standard estimate coefficient is equal to 0/71 that shows the effect is positive and significant.

−Findings of research indicate the confirmation of first subhypothesis with path coefficient 0/61 and significance number 8/14. Given that t-statistic is equal to 8.14 and is greater than 1.96 therefore, it has significant effect on organizational performance after reliability. In other words standard estimate coefficient is equal to 0/61 that shows the effect is positive and significant. The result indicates that reliability has an effect on organizational performance. In other word, when this company in providing services to its customers, giving them promise that they do it correctly and exactly, the fulfillment of this promise by the company creates a sense of confidence and also the space of trust.

−Findings of research indicate the confirmation of second sub hypothesis with path coefficient 0/73 and significance number 9/28. Given that t-statistic is equal to 9.28 and is greater than 1.96 therefore, next the responsiveness it has significant effect on organizational performance. On the other hand standard estimate coefficient is equal to 0/73 that shows the effect is positive and significant. The results indicate that responsiveness has an effect on organizational performance. Therefore, we can conclude that serving timely services to customer and also responsiveness and company sensitiveness to quality of performed services to customers can directly have effect on organizational performance.

−Findings of research indicate the confirmation of third sub hypothesis with path coefficient 0/68 and significance number 8/15. Given that t-statistic is equal to 8.15 and is greater than 1.96 therefore, next the assurance it has significant effect on organizational performance. On the other hand, standard estimate coefficient is equal to 0/68 that shows the effect is positive and significant. Results state that the competence and ability of company's employees to convey a sense of trust and confidence is high.

−Findings of research indicate the confirmation of fourth sub hypothesis with path coefficient 0/93 and significance number 9/37. Given that t-statistic is equal to 9.37 and is greater than 1.96 therefore, next the empathy it has significant effect on organizational performance. On the other hand, standard estimate coefficient is equal to 0/93 that shows the effect is positive and significant. Results show that empathy has effect on organizational

performance. Then we can say appropriate dealing with different behaviors of customers create satisfaction among them and this satisfaction cause to optimum performance in company.

–Findings of research indicate the confirmation of fifth sub hypothesis with path coefficient 0/52 and significance number 7/00. Given that t-statistic is equal to 7.00 and this number is greater than 1.96 therefore, next tangibles it has significant effect on organizational performance. On the other hand, standard estimate coefficient is equal to 0/52 that shows the effect is positive and significant. Results show that tangibles have an effect on organizational performance. We can say that all equipment, facilities, public space of the company, appearance of employees and finally communication materials through which services are provided will have a direct effect on customer satisfaction and organizational performance. Positive impact of customer satisfaction on organizational performance in this study is in accordance with previous researches findings. For example, (Jeh-Nan and Hung, 2015) reached to the conclusion in their study that organizations have to invest on customer satisfaction and customer loyalty for better performance.[8] Reached to the conclusion in his study that two factors of responsiveness and respect have an effect on customers' satisfaction and leads to effectiveness inside the organization. [8]Reached to the conclusion in his study that four dimensions of Sevqual model affects the quality of services. [9] Reached to the conclusion in his study that customer satisfaction is one of the ways to increase capabilities of organizational agility. [10] Stated that there is a direct relationship between customer satisfaction and organizational performance. [11]stated based on obtained results that there is a significant relationship between quality of services with customer satisfaction and performance.

Evaluation and identification of customer satisfaction and measuring customer satisfaction is important for the reason that the level of customer satisfaction at last determines the success or failure of organizations. If performance of organization be always lower than customer expectations, customers will depart from organization and organization finally go to bank ruptcy.Certainly, organizations with higher levels of customer satisfaction are always stronger and more successful in long term. Customer satisfaction as the most important index in definition of the quality of productions and services is considered as an essential needs of today's organizations. A responsive authority to solve customers' problems; identification the hidden needs and customers' expectations and expand the scope of company's services; training and encourage of employees in order to good relation with customers and solve problems of customers; establishing systems to measure customer satisfaction and honoring the clients; hearing the views of customers and applying it in work process in order to cooperate in company's activities; improve informational and communicational systems of organization; creating group coherence and changing the attitude of employees to provide services to customer and client as much as possible; provide feedback on the quality of employees' work are suggestions have been provided for more effectiveness of customers' satisfaction on organizational performance.

CONFLICT OF INTEREST
There is no conflict of interest

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MANAGEMENT

ARTICLE **OPEN ACCESS**

THE STUDY OF KNOWLEDGE MANAGEMENT'S EFFECT ON CRM SUCCESS CRM): THE MEDIATING ROLE OF ORGANIZATIONAL FACTORS IN THE BRANCHES OF MELI AND SADERATBANK IN OMIDIYEH, AGHAJARI AND THE MIANKOOH CITY

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ABSTRACT

This study was done in order to investigate the management's effect on CRM success (CRM): the mediating role of organizational factors. The study population is Saderatbank and Mellibank in Omidiyeh, Aghajari and MianKooh city that consisting of three banks: Saderat and 5 Mellibank in Omīdīyeh and 1 Saderatbank and 1 Mellibank in Aghajari and MianKooh. Its sampling is random and Krejcie and Morgan table to determine sample size of each banks. The methodology was based on objective which is functional and in terms of data collection is considered as descriptive research, and in terms of causal relation between variables, specifically it is based on structural equation modeling. In order to measure the research variables also have been used the questioner andstatistical analysis methodsusing Software SPSS.18 and LISREL.8.5. Results of the questionnaire analysis showed that the knowledge management has a significant positive impact on customer relationship management with the mediating role of organizational factors.

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INTRODUCTION

Now, knowledge society or knowledge-based economy is specified by factors such as increased competition, technological innovation and global nature of the market [1].In this society, companies must consider their knowledge during business as a key factor to build a competitive advantage [2,3].Moreover, in recent years, knowledge is considered as an important source of organization that has growing interest in this concept. That is why knowledge management has become a research priority in the academic community and is one of the areas that companies share more costs of its administration [4].

Customer relationship management has emerged as a field of application and research. CRM Articles insist that companies have found to retain existing customers by developing long-term relationships and meet their needs and this is more profitable than attract new customers. This long-lasting relationships which greatly based on customer knowledge and KM and CRM systems, not only improves the organization's ability to engage, attract and build personal relationships with customers, but also increases ability to increase customer knowledge[5]. By investigation the articles, we found that many studies pay to analyze critical role as determinants of the success of KM initiatives together with other factors (organizational and technological and market-related factors), however, there is a lack of understanding about impact of these factors on the CRM success.

As a result, our research question as the following: Does knowledge management have a major determinant of successful implementation of CRM? Are there other relevant factors? What is their role in the success of CRM?

MATERIALS AND METHODS

The theoretical framework

In this section of the paper will be discussed the history of literature and research about customer relationship management, knowledge management and organizational factors.

Customer relationship management

Despite the recent birth of CRM, in the nineties decade, since then, has become a key tool for business management [6]. Similarly, research in the field of CRM considerably has increased over the past few years, [7]. After reviewing the literature on the concept of CRM [8,9], can say that yet has not reached to an agreement on the framework of a clear definition of the concept of CRM. We summarize the concept of CRM through literature review as below: CRM is a business strategy that aims to create and extend the value of building relationships with clients based on knowledge. Using IT as an enabler, CRM need to redesign the organization and its processes to direct them to the customer, so by customizing their products and services, companies will be able to meet customer needs and thereby create generating long-term relationships, mutually beneficial, and loyalty relationship.

CRM and KM

In recent years, companies have integrated their efforts in areas of CRM and KM, because they realize that KM plays a key role in successful CRM [10]. Identify customer has high-value and is complex knowledge, because need to specify the range of profiles among current customers. Technology can help but KM gives us information processing power for effective use of technology. Relationship with customers, need to a solid understanding of the exchange of tacit knowledge, and can meet new customer needs using statistical methods with technology skills, but can only do so much good that are implementing the exchange of tacit knowledge dimension and cooperation [11].Therefore, CRM processes are based on vast amounts of knowledge.

Affecting factors on CRM Success

Based on the extensive review of articles on this subject, mentioned a successful model for CRM implementation with regard KM as the main factor of success and were developed other four factors in the articles: organizational factors, technology, customer orientation and CRM experience. These factors have directly or indirectly effect on the CRM success. Intended one direct effect on the CRM success. Indirect effect on the success of CRM, are considered not only directly but also through the influence of other factors.

KM capabilities and CRM success

Knowledge management capabilities, organization ability to acquire, manage and provide a valid customer, goods and information, response customer service in real time to improve and provide faster decision making is based on reliable information. As a result, CRM and KM initiatives drive towards a common goal: to provide continuous improvement to customers [12]. In addition, is considered the creation and transfer of knowledge as a strategic significant force because it is one of the fundamental processes that determine learning and organizational innovation. For this reason, KM, has a decisive role in the CRM implementation, because it involves a change in corporate vision and therefore causes learning and innovation in the organization.
Hypothesis 1: KM capabilities have an effect on the CRM success.

Organizational variables and the CRM success

These variables have aspects of working with human resource management, organizational structure, and allocation of resources. Since the implementation of CRM need to change both way that organized the company and its business processes [13]. each model requires a variable to measure the importance and impact of these organizational factors in the success of CRM. In fact, in order to implement CRM success a company requires redesigning their organization and led its value chain to the customer demand [14].As such, this strategy, organizational structure and business processes all need to change to implement CRM, because the success of this project depend on co-operation between technological systems, processes and people.

On the other hand, the human factor is very important, because even the best defined processes and communication between people with the most advanced technology has a decisive role in the implementation of any business strategy [15]. That's why factors such as staff training and motivation and reward systems would be appropriate because of employee participation is determined in the implementation of this strategy. Moreover, the corporate culture also plays a key role in KM: vision, rules, structure and reward system of direct transfer of knowledge within the company and therefore directly have an effect on the successful implementation of this type of initiative. To measure organizational variables in this article we use technology, customer-oriented, and experience.
Hypothesis 2: Organizational variables have an effect on the CRM success.
Hypothesis 3: KM functionality has an effect on CRM success through the mediating role of organizational factors.

The conceptual model of research

Based on literature research, has been designed the following conceptual model **[Figure– 1]**.
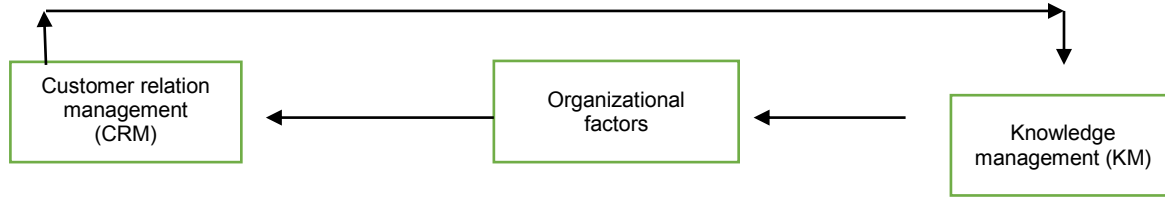
Fig: 1.A conceptual model (researcher-made)

Method

The current research based on objective is functional and in terms of data collection is considered as descriptive research.BankSaderat and bank Melli in Omidiyeh, Aghajari and MianKooh city was chosen as the spatial domain. Three bank Saderat and 5 banks Melli in Omīdīyeh and 1 bank Saderat and 1 bank Melli in Aghajari and MianKooh. Using simple random sampling and Krejcie and Morgan table to determined sample size of each banks.110 questionnaires were distributed and the same number of respondent's valid questionnaires was collected. To measure the research variables have been applied the standard questionnaire, customer relationship management and knowledge management and organizational factors. The questions are divided into two categories: general and specialized questions, based on the scale five-point Likert (very low, low, medium, high and very high). In order to determine the reliability of the questionnaires using Cronbach's alpha based on statistical SPSS.18software. In **[Table 1]** the provided item for measurement of any latent variable and Cronbach's alpha coefficientis specified for each variable.

RESULTS ANS DISCUSSION

In this part of the article will be discussed the results of confirmatory factor analysis models and the results from the test research hypotheses using SPSS and LISREL.

Evaluate measurement models

In structural equation modeling is necessary to ensure the accuracy of measurement models. So provided measure the results of confirmatory factor analysis models variables.

Table:1. compares the measurement models

Measurement model	Confirmatory factor analysis	X^2	df	$X^{2/df}$	p-value	RMSEA	GFI	AGFI
knowledge management	first time	703/44	285	2/46	0/0000	0/044	0/092	0/090
customer relation management	first time	26/84	20	1/3	0/13994	0/031	0/098	0/097
Organizational factors.	first time	0/01	5	0/002	1/0000	0/000	1/00	1/00

As is observed in the **[Table– 1]**, the measurement results of confirmatory factor analysis models, knowledge management, customer relationship management, and organizational factors indicate that the main indicators fit at all latent variables is in appropriate and acceptablescope. In other words conceptual model is largely based on observed data**[Table– 1]**.

The findings of the research hypothesis

The implementation of structural equation model to test hypotheses of this research, first the software output indicated the suitability of the fitted structural model (=2/56/df=0/053 ،χ^2RMSEA،91=0/GFI=0/90 ،AGFI ، 94=0/NFI ،90/9NNFI= ،9=0/9CFI).In other words, the observed data to a large extent is based on the conceptual model **[Figure– 2]**.

Chi-Square=339.68, df=132, P-value=0.00000, RMSEA=0.053
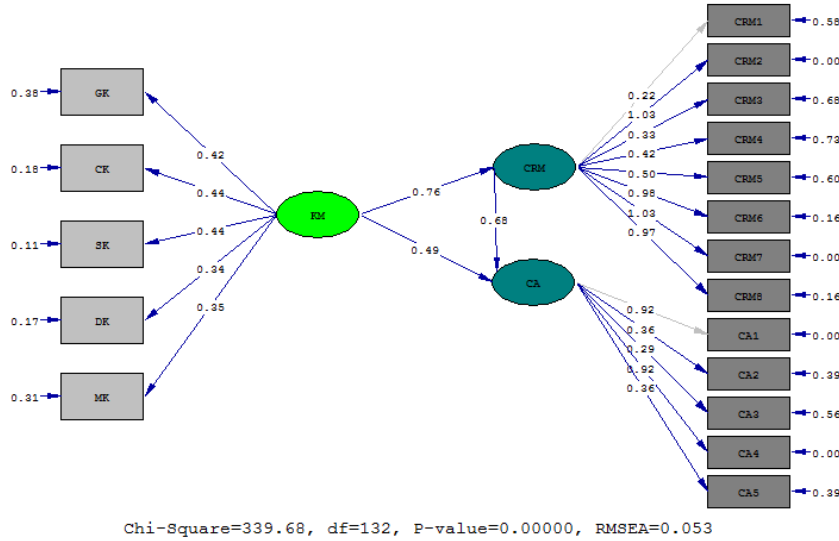
Fig: 2.The structure of the research in a standard estimate

In[Figure-3]has shown significant coefficients and obtained parameters of the structural model[Figure– 3].

Chi-Square=339.68, df=132, P-value=0.00000, RMSEA=0.053
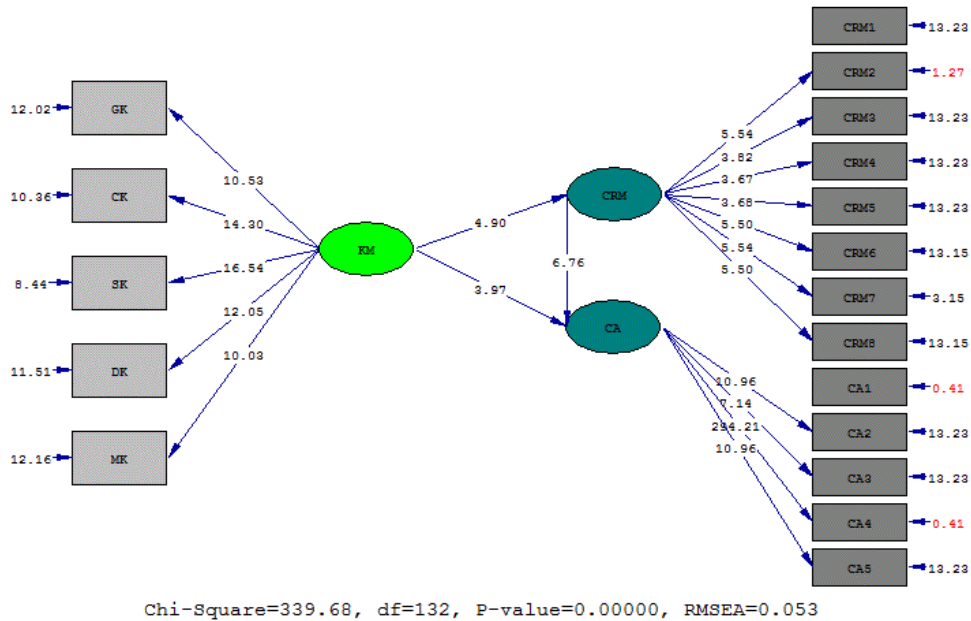
Fig: 3. significant numbers of Structural model coefficients

Structural equation modeling results show that knowledge management has a positive impact on the success of customer relationship management (β = 0.76; t = 4.90) and organizational factors (β = 0.49; t = 3.97). The results confirmed the effect of mediation role of organizational factors on knowledge management and customer relationship management (β: 0.68 * 0.76 = 0.5168> β: 0.49). Therefore, the null hypothesis is rejected and all research hypotheses are accepted[Table– 2].

Table: 2. Described the variables, dimensions and research instrument validity

Variable	Variable type	Reliability coefficient	The number of items
knowledge management	Independent	0/991	15
customer relation management	Dependent	0/987	8
Organizational factors	Mediator	0/885	5

As seen in the above **[Table-2]**, Cranach's alpha coefficient indicates the reliability and validity of the research tool. Also for questions validity were used of two-factor: content validity and factor validity. To test the validity of the questionnaire content was used of the collective opinions of experts, academics and professionals; and finally ensure that the questionnaires measure the intended characteristics of the researchers. Factor validity test questionnaire was performed with the help of confirmatory factor analysis using LISREL software. Looking at the results of LISREL in Table 2 it is seen that all three measures are met the listed conditions and appropriate models. Overall, the results of this study indicate that the questionnaires have reliability and validity. Data analysis is done in two levels of descriptive and inferential statistics.

CONCLUSION

In a number of studies [16], we found that organizational factors (strategy, management support, organizational structure, human resources) are key factors of CRMsuccess. The estimated model shows that organizational variables are record of CRM success, and in turn, are under the effect of KM, CRM technology and customer requirements.

The results of the experimental test model confirm that organizational factors play a major role in the implementation of CRM (aspects of the conduct of senior management leadership, human resource management, integration, performance, and organizational structure). Although this articles emphasize on the KM role as a key determinant of CRM success, according to our analysis, organizational variables come first inCRM success, because due to the effect of other variables (including the ability of KM, their technological factors and customer). These findings suggest that even if the company have initiatives KM,gained the most advanced technology and tries to be a customer oriented, if these plans not integrated, company cannot redesign organizational structure or processes, and not all participate in this project, and the changes do not lead properly, and CRM implementation will not be successful.

Moreover, although we believe that CRM is a business strategy and IT enablers, analysis shows that simple introduction of components of KM or CRM technology does not produce benefits for companies or does not have positive impact on results. So in order to be successful initiatives in the company and represent a source of competitive advantage, need to change the engineering organization.

Here evaluate theobtained results from the resource-based view shows that, the current findings are consistent with the theory, that have the special role of internal and organizational aspects as factors affecting the company's success. As a result, according to this theoretical approach, efficiency and success of the company will be the function of abilities, skills and qualifications for participation in resource management that will facilitate the creation of sustainable competitive advantage. In our study, these results suggest that only when the capabilities of the KM, CRM technology and customer-centric orientation internalize and integrated throughout the organization, establishes the organizational capabilities in CRM in the company that it is difficult its mimic and reproduce and hence is a source of sustainable competitive advantage.

CONFLICT OF INTEREST
Authors declare no conflict of interest

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ARTICLE **OPEN ACCESS**

THE IMPACT OF CUSTOMER LOYALTY ON ORGANIZATIONAL PERFORMANCE IN THE PERSONAL BANKS IN KHUZESTAN (CASE STUDY: AHVAZ METROPOLITAN BRANCHES)

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ABSTRACT

Today's marketers are looking for ways and information through it cause Loyal customers for themselves because it reduces marketing and costs and increase profitability. The aim of this study was to evaluate the impact of customer loyalty on organizational performance in the private banks of Khuzestan (Case study: Ahvaz metropolitan branches). The statistical population of this study consisted of six banks (Mellat, Parsian, Pasargad, Tejarat, Saderat and Ayande). The research method is based on objective, is functional and based on how to collect data is descriptive research, and in terms of relationships between variables is causal and specifically is based on structural equation modeling. To measure the research variables, the questionnaire (standard of customer loyalty and organizational performance) and methods of statistical analysis using SPSS and LISREL is used. Results of the questionnaire analysis showed that customer loyalty and its dimensions have positive and meaningful impact on organizational performance.

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INTRODUCTION

Building customer loyalty, especially banking customers is a concept that in today's businesses because loyal customers are the main component in the success of banks, noted over and over.No business other than state-monopoly organizations cannot survive without loyal customers.In addition to the fact thatcustomer expectations are constantly rising,banks are required to go beyond the basic needs of customers, satisfy their expectations shifted their focus from mere satisfaction of the customer to build loyalty and trust by fostering long-term, mutually and profitable communication for both sides.Of course in other divisions, many researchers for compiling loyalty strategies, customers are divided according to their levels of loyalty.Generally, attitudes and behaviors of different groups of customers are different.Therefore, these programs should be tailored to each of the levels intended for loyalty of new customers and restore the old customers to the bank.the pace of change on the eve of the twenty-first century is so high that it is not possible to understand its way simply,and despite the fact that organization managers must guide and lead themselves in maze of time proportional to this transformation.Create customer-oriented culture among the employees is considered of an organization's success factors.The culture of an organization should be such that the organization pays attention more than anything to the customer needs, as well as build their performance based on customer satisfaction and ultimately gain their loyalty.In the today's competitive world, banks to keep their customers should pay most attention to their comments and objections in relation to the banking services, and should know that in banking, the customer's voice is a voice that the bank's policies should be shaped by it.Items such as reverence for customers, appropriate interaction with customers, customer surveys, appropriate relationship mutually with customers,review customer problems, and timely investigation into their complaints, awareness of customer satisfaction, enhance the quality and speed of service delivery, matching the Bank's policies with the needs of customers, verification services provided to customers and..... can be a great help to the banks to retain customers. And it would not be possible unless the banks accept that pay attention to consumers is key to the survival of them.Today customer satisfaction is not sufficient and organizations including banks should not satisfy their customers' satisfaction.They should ensure that their satisfied customers are loyal.The aim is to establish long-term relationships with customers in order to gain long-term benefits for the bank.So, today the bankers see themselves in the mirror of customers, and strive in the absence of by the passage of time compete becomes more complex harder for banks,understand their customers and make them that their customers have complete faith.

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MATERIALS AND METHODS

Today's world, especially the world of organization, experiencing dramatic and continuous change, and all aspects of the organization from the internal environment to the external environment, human and non-human factors, etc., all by stunning acceleration are changing from one state to another. Organizational performance is one of the most important structures discussed in management research, and without doubt is the most important measure of success in business companies. Organizational performance is a broad concept that covers what's production of company, as well as areas where they interact [1].In most organizations, managers and leaders have always sought to improve their own organizations. Organizational performance is wide mix of non-tangible received, such as increased institutional knowledge and tangible and concrete received such as economic and financial results [2]. Performance in the dictionary means the state or quality of work, so, organizational performance is an overall structure that refers to how to conduct organizational operations. The most famous definition of performance is provided by[2]. "the process of explanation the quality of effectiveness and efficiency of past actions." According to this definition, the performance is divided into two components: 1) Efficacy which describes how the use of resources in the production of services or products, it means the relationship between the real and the ideal combination of inputs to produce specific outputs; and 2) effectiveness that describes the degree of achievement of organizational goals. On the other hand, the attitude of companies and institutions to promote competition inevitably concentrated on attract more customer satisfaction for sales and profits. With the transition from a traditional economy and intense competition in new dimensions, customer is the central pillar of all activities of the organizations, in a way that from the competitive perspective, survival of organizations depends on the identify and attract new customers and retain existing customers. In the any organization, whether manufacturing or service, customers are the most important factor for preservation and survival of the organization. If the organization can be successful by building loyalty with customers' satisfaction, can provide long-term growth and survival [3]. As marketers today are seeking ways and information to through it create loyal customers for themselves. Because it reduces marketing and operational costs and will increase profitability [4]. Organizations in the past, were only thought to find new customers and grow customers, and had no meaning. Achieve every new customer was seen as a victory, and special attention was not also paid to existing customers. But now the situation has changed and keep and grow profitable customers is the first purpose of the organization; so that [4], is defined Marketing as "Science and art of finding, keeping and growing profitable customers". At a time, production unit and related activities were the beating heart of the organization, and all the goals and strategies of the organization were focused on the development of this sector. After a while, this focus was more on the financial sectors, and the goals and strategies of different parts of the organization, was set in the line with the financial objectives and strategies. But today, at least in developed societies, customer is considered as a key and pivotal factor in organizations, and orientation of all the organizational goals, strategies and resources are focused on attracting and keeping profitable customers. So, issue of "maintaining and strengthening customer loyalty" for the companies that have concerns of maintain and develop their competitive position in the market. It is as strategic challenge, and also spend many cost for understanding this concept and achieve practical solutions to reinforce it; because by the intensity of competition and approached the quality and quantity of goods and services in the customer's choice, providing goods or services that could be of interest to customers, and making them a repeat customer of organization products is considered vital and necessary. Also creating a positive mentality in the customers towards goods or services creates a competitive advantage that if organizations want to enter new markets or offering new products or services, easily find their ability to communicate with customers, and also customers will decide more easily about new product or service [5]. Creating customer loyalty is the main objective of marketing activities. [6]Defines customer loyalty as "profoundly committed in a superior product or service, despite the efforts of marketing and situational factors that potentially lead to changes in behavior." According to the[6]the purpose of this naming is to facilitate the task of companies to achieve and retain loyal consumers with reasonable cost and achieve faster return investment. Loyalty is reflective of functions desirability of services and productions. [6]stated that loyal customer is the consumer that going to repurchase the company's services, has a positive attitude towards service, and willingly, introduce the company to others [7]believe that loyal customer is someone who values relationship with company, and chooses the company as his/her main priority to buy [7].

Therefore, we study customer loyalty on organizational performance in the statistical population, and the question we face in this research is:
What is the effect of customer loyalty on organizational performance in private banks of Khuzestan (Case study: Ahvaz metropolitan branches)

RESULTS ANS DISCUSSION

Theoretical framework of research

In this part of the article, literature and history of research is described in terms of customer loyalty and organizational performance.

Customer loyalty

The concept of loyalty, first created in the 1940s. At that time, loyalty concept was single. Later in the period from 1944 to 1945, were formed two distinct concepts about loyalty: brand preference which later was introduced as attitudinal loyalty, and market share which later became known as behavioral loyalty. 30 years later, the concept of loyalty entered academic literature, and the researchers found that loyalty can be a combination of attitudinal and behavioral loyalty [8]. One of the most important issues that face organizations managers today is how to better understanding the relationship between brand and customer loyalty concepts, especially in marketing

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management literature suggested many factors that affect customer loyalty. [9]loyalty can be achieved through higher yield than the buyer expected, in a way that the buyer wonders of value that has achieved, and recognizes this value beyond his/her expectations. Loyalty played a role in creating long-term benefits for the company, because loyal customers require fewer promotional activities than other customers. They gladly will to pay more for their favorite benefits and quality of service. In addition, organizations can gain greater market share with the help of loyalty [10]. Customer loyalty is a significant factor in the business success of a company. We know very well there is no guarantee that satisfied customers repurchase of company, that's why today revealed that customer loyalty in the business success of a company significantly is more important than customer satisfaction [11].

In this research to measure customer loyalty, we use the customer loyalty triple approach of [11], which behavioral loyalty, attitudinal loyalty and cognitive loyalty.

- Behavioral loyalty: Mode of consumer in terms preferences or biases that cause repeated. Of course, because this attitude is merely focus on result, visibility is limited to a dynamic process.

- Attitudinal loyalty: When the repeat is a factor that acts as leaving barrier of customer, this approach is reflected in the willingness to recommend to others.

- Cognitive loyalty: This approach applies in first service when making a purchase comes in mind.

Organizational performance

Functioning of a person, is the scale of his success in doing job, and usually obtained from the individual output or evaluating the success of individual behavior compared to organizational expectations [12]. Human performance is the result of a series of actions that carried out to achieve a goal based on a specific standard. Actions may include observable behaviors or mental processes cannot be seen. Organizational Performance refers in how to carry out the organizational mission, tasks and activities and results of them. In another definition, organizational performance is achieve organizational and social goals and goes beyond it and responsibilities of the organization [13]. In another definition, organizational performance is an indicator that measures how to achieve the goals of the organization or institution. In the current era, amazing changes of management knowledge, has avoided the evaluation system; in such a way that the lack of assessment in the various aspects of organization including assessment the use of resources, personnel, objectives and strategies, is one of the symptoms of organization disease. Each organization to determine the desirability of and quality of their activities, especially in the complex dynamic environment, needs to evaluation system. On the other hand, lack of evaluation system and control any system means can be considered no communicate by internal and external environment that its consequence is aging and death of the organization [14]. Performance is one of the fundamental concepts of management, because many of the management form tasks based on that. In other words, success of the organization can be seen in the mirror of their performance. According to [14], performance measurement is the process of ensuring that an organization pursues strategies that lead in goals. [14]in his definition of performance measurement, focuses on the quality of management and value creation: evaluate how to manage organizations and their value to customers and other beneficiaries [15]. In the performance measurement, there are two main approaches: objective and subjective, both approaches have their advantages and disadvantages.

Objective scales are more realistic, but in terms of the scope of coverage, limited to financial data, and do not explain other aspects of organization. On the other hand, the mental scales are less realistic; but provide rich descriptions of effectiveness of the organization. These scales allow a wide range of organizations in different industries are compared [16].

Research models and hypotheses
Conceptual model and research hypotheses

[Figure- 1] shows the research conceptual models which based on theoretical foundations are suggested. This model shows the impact of customer loyalty on organizational performance[Figure-1].
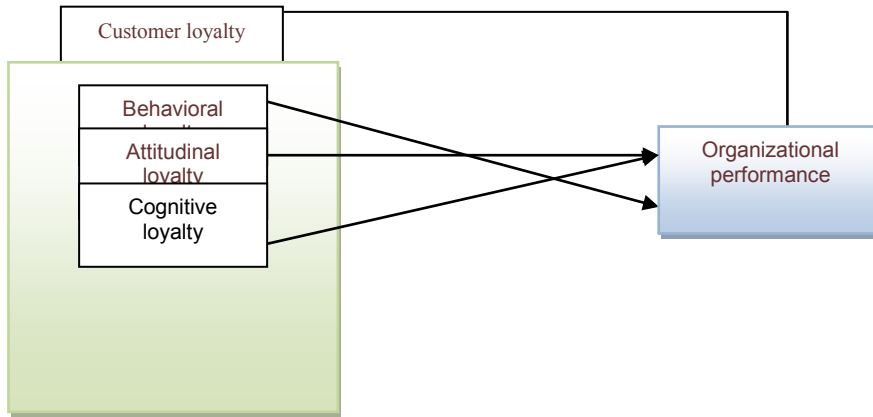
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Fig:1. The conceptual model of research

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Research hypotheses

The main hypothesis: customer loyalty has a significant and positive impact on organizational performance in the private banks of Khuzestan (the case study: metropolitan branches of Ahvaz)

Subsidiaryhypothesis

Subsidiary hypothesis 1: Loyalty behavior has a significant and positive impact on organizational performance in the private banks of Khuzestan (the case study: metropolitan branches of Ahvaz).
Subsidiary hypothesis 2: attitudinal loyalty has a significant and positive impact on organizational performance in the private banks of Khuzestan (the case study: metropolitan branches of Ahvaz).
Subsidiary hypothesis 3: loyalty cognitive has a significant and positive impact on organizational performance in the private banks of Khuzestan (the case study: metropolitan branches of Ahvaz).

Research method

This study based on objective, is functional and based on how to collect data is descriptive researchand in terms of the relationship between variables in research is causal.The statistical population of research is tprivate banks of metropolis Ahvaz that includes 6 banks, Ayande, Parsian, Pasargad, Tejarat, Mellat and Saderat. Ayande bank by five branches (45 people), Parsian bank by 4 branches (40 people), Pasargad bank by 7 branches (70 people), Tejarat bank by 48 branches (384 people), Mellat bank by 39 branches (351 people) and Saderat bank by 56 branches (336 people) make the study population.Using simple random sampling and Krejcie and Morgan table, sample size was determined for each of banks individually.From Ayande bank 40 people, Parsian Bank 36 people, Pasargad bank 70 people, Tejarat Bank 186 people, Mellat bank183 people, and Saderat bank 177 people were selected.In order to measure customer loyalty and organizational performance respectively a standardized questionnaire of [17]were used.A total of 610 valid questionnaires were collected.Questions in the questionnaire are divided into two categories: general and specialized questions that are based on five-point Likert scale (very low, low, medium, high and very high), respectively.In order to determine the reliability of questionnaires, Cronbach's alpha using SPSS statistical software was used.In the table 1 the number of items offered for measuring each variable and Cronbach's alpha coefficient for each variable is specified**[Table-1]**.

Table: 1. outlines the variables, dimensions and instrument validity of research measurement

The number of items	Reliability coefficient	Variable
15	0.872	Customer loyalty
6	0.926	Organizational performance

As seen in the **[Table-1]** above, cronbach's alpha coefficient is indicator of validity and reliability of research tools. As well as to test the validity of questions, content validity and factorial validity were used. To test the

validity of the questionnaire content, the collective opinions of experts, academics and experts were used; and ultimately ensured that the questionnaire measures the same researchers attribute. Factor credit test of questionnaire with the help of confirmatory factor analysis and using LISREL software were performed. By looking at the results of LISREL in the Table 3, it is seen that both models of measurement are met the conditions listed and are appropriate models. The sum of these results indicates that the survey questionnaires are valid and reliable enough.

Research findings
Describe the sample demographic

89% of respondents were male and 11 percent of them were women.7% of respondents are replaced in the age group 20 to 30 years, about 55 percent of the respondents in the age group 31 to 40 years, and finally 39% of respondents in the age group 41 years and above.79 percent of respondents were employees, and 21% of them were managers.The largest number of respondents, respondents with a bachelor's degree is (76) percent.The largest number of respondents are respondents with a history of 21 years and older of working (with 38.4 percent) **[Table-2]**.

Table: 2. Descriptive findings of the study variables

Average					Bank
Organizational performance	Costumer loyalty	Cognitive loyalty	Attitudinal loyalty	Behavioral loyalty	------------
3.7053	3.8797	3.6943	3.7525	3.7732	Melat
3.7234	3.9833	3.6667	3.8278	3.9556	Parsian
3.5467	3.6699	3.5192	3.5609	3.5897	Pasargad
3.6555	3.7542	3.5521	3.6156	3.6333	Saderat
3.7025	3.8721	3.6609	3.7229	3.7519	Tejarat
3.8367	3.9804	3.7059	3.8824	4.00490	Ayande

As can be seen in Table 2, according to the measurement scale that is five point Likert and its average is 3, it is showed that gained average of studied variables and its dimensions is more than 3.

The study of measurement models

In this section of the paper the results of confirmatory factor analysis of measurement models and also the results of the test research hypotheses using statistical software LISREL will be discussed. In structural equation modeling is required to ensure the accuracy of measurement models. So, in the following the results of confirmatory factor analysis of measurement models of research variables are provided **[Table-3]**.

Table: 3. Comparison of measurement models

AGFI	GFI	RMSEA	p-value	χ^2/df	Df	χ^2	Confirmatory factor analysis	Measurement model
0/90	0/91	0.054	0/00000	2.24	187	419.63	Second order	Customer loyalty model
0/91	0/92	0.047	0/00000	2.07	79	154.47	First order	Organizational performance model

As in **[Table- 3]**is observed,confirmatory factor analysis of measurement models of customer loyalty and organizational performance shows that the main indices of fitting all latent variables are in appropriate and acceptable scope.In other words conceptual models are largely based on observed data.

The findings of study hypothesis testing

After confirmatory factor analysis and identification of latent variables,in this section, we will do the appropriate analysis to test hypotheses.To test the hypotheses, structural equation modeling and LISREL software are used.In the implementation of structural equation modeling to test the main hypothesis first the software output indicates fitted structural model(=2/03/df=0/040 ‹χ^2RMSEA=0/93 ‹GFI=0/91 ‹AGFI ‹97=0/NFI ‹990/NNFI==0/99 ‹CFI). In other words, the observed data to a large extent are based on a conceptual model of research**[Figure-2]**.

Chi-Square=256.76, df=126, P-value=0.00000, RMSEA=0.040
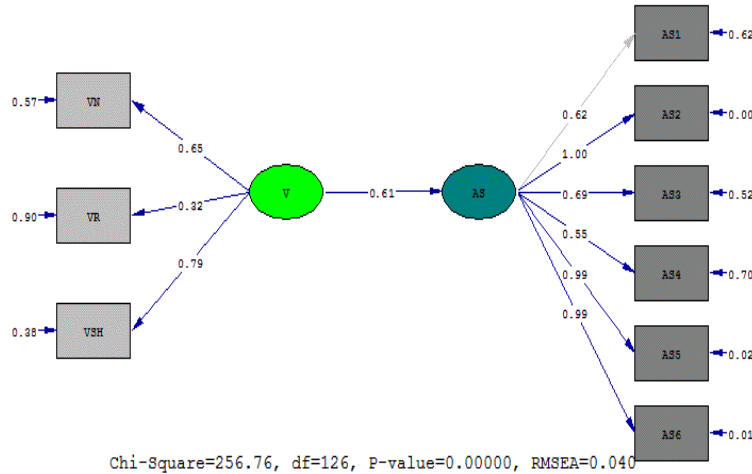
Fig:2. The structural model of research to test main hypothesis in a standard estimate

In **[Figure-3]** also significant coefficients and obtained parameters of the structural model of research have shown**[Figure-3]**.

Chi-Square=256.76, df=126, P-value=0.00000, RMSEA=0.040
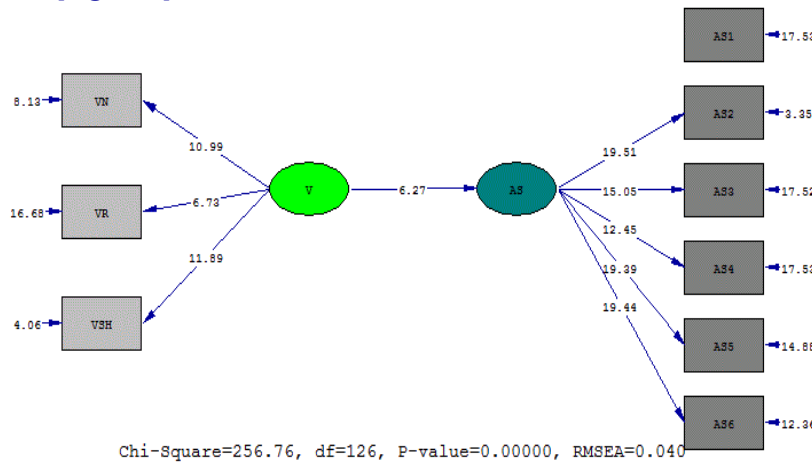
Fig:3. Significant numbers of structural model coefficients of research to test the main hypothesis

Structural equation modeling results show that customer loyalty affects organizational performance in the private banks of Khuzestan province (Case study: Ahvaz metropolitan branches) ($\beta = 0.61$; t = 6.27). Therefore, the null hypothesis is rejected and main hypothesis is confirmed.

Subsidiary hypothesis test results

In the implementation of structural equation modeling to test the subsidiary hypothesis first the software output indicates fitted structural model(=2/53/df=0/042 ‹χ^2RMSEA=0/91 ‹GFI ‹90=0/AGFI=0/95 ‹NFI ‹970/NNFI= ‹

=0/98CFI). In other words, the observed data to a large extent are based on a conceptual model of research**[Table-3]**.

Table:3. Test results of secondary hypotheses

Test result	A significant number	Path coefficient	The dependent variable	independent variable	Hypothesis
Confirmed	6.27	0.61	Organizational performance	Costumer loyalty	The main hypothesis
Confirmed	6.71	0.61	Organizational performance	Behavioral loyalty	Subsidiary hypothesis 1
Confirmed	6.82	0.69	Organizational performance	Attitudinal loyalty	Subsidiary hypothesis 2
Confirmed	6.45	0.69	Organizational performance	Cognitive loyalty	Subsidiary hypothesis 3

Structural equation modeling results show that behavioral loyalty (by effect coefficient 0.61), attitudinal loyalty (by effect coefficient 0.69) and cognitive loyalty (by effect coefficient 0.51) has effect on organizational performance in the private banks of Khuzestan (Case study: Ahvaz metropolitan branches). Therefore, the null hypothesis is rejected and all assumptions of research are confirmed.

CONCLUSION

This study uses a model framework of [17] examined the impact of customer loyalty on organizational performance. **[Table- 4]**and **[Figure- 2 and 1]**show test results of structural relationships between research variables.

* Research findings showed that confirmation of main hypotheses by path coefficient of 6.10 and a significant number of 27/6. Given that the t-statistic is equal to 6.27 and this value is greater than 1.96, so, customer loyalty has a significant effect on organizational performance. On the other hand, standard estimate coefficient is equal to 6.10, which shows a significant and positive impact.

* Research findings showed that confirmation of main hypotheses by path coefficient of 0.61and a significant number of 6.71. Given that the t-statistic is equal to 6.71 and this value is greater than 1.96, so, the behavioral loyalty has significant influence on organizational performance. On the other hand, standard estimate coefficient is equal to 6.10, which shows a significant and positive impact.

* Research findings showed that confirmation of main hypotheses by path coefficient of 0.69 and a significant number of 82.6. Given that the t-statistic is equal to 6.82 and this value is greater than 1.96, so the attitudinal loyalty has significant influence on organizational performance. On the other hand, standard estimated coefficient is equal to 69/0 which shows a significant and positive impact.

* Research findings confirmed the third subsidiary hypothesis with path coefficient of 51/0 and a significant number of 45/6.Given that the t-statistic is equal to 6.45 and this value is greater than 1.96, so the cognitive loyalty has significant influence on organizational performance.On the other hand, standard estimated coefficient is equal to 51/0 which shows a significant and positive impact.

Positive impact od customer loyalty on organizational performance in this study are consistent with findings from previous studies. For example, [18]concluded that the customer loyalty has an impact on competitive advantage.[18]in a study concluded that the factors of satisfaction, value, resistance to change, effectiveness, trust and fairness of institution have close relation with customer loyalty.

[19]by study the relationship between satisfaction and loyalty of customer, concluded that close relationship with the customer, close relationship between employee and the customer, behavioral loyalty, willingness in loyalty, willingness In loyalty to other customers and loyalty to employees, are product of satisfaction with the services of a company. [20]in their study stated that the organization can by obtaining the loyalty of our customers gain advantage against competitors. [21] acknowledged that customer-oriented and customer loyalty has an impact on innovation and marketing and in this way, the organization will achieve higher organizational performance. [22]in their study concluded that the results showed that the four dimensions of accountability, dynamism, emotional, courage have impact on the attitudinal loyalty, and attitudinal and behavioral loyalty to the brand. [23]in his

research stated that factors such as trademark features, characteristics of the company, create value, oral communication and competitive position, as confidence-building indicators are directly create customer loyalty.

The recommendations are provided for more active role of customer loyalty on organizational performance:

√ Qualified skilled and knowledgeable workers who assume the problem of customers as their problem, are trump card of any serving organizations to attract the trust of customers. Appropriate training courses improve the ability of individual employees in the this field;

√ Communicate more with the customer form customer contact center;

√ Efforts to gain the trust and confidence of customers in advertising;

√ Allocation more points to customers with a history;

√ Principal focus of managers should be on refrain from activities that reduce their validity. So, it should not be promise to customers that run it is difficult or impossible or not their specialty;

√ In the planning attention to the needs and demands of customers should be a top priority and everyone should strive to high quality services;

√ Handling complaints is specific part of the interaction with the customer. Encounter slow and false with provided complaints may be from customers is considered opportunistic behavior or incompetence that it is logical. Therefore, it is essential to authorities would be more careful towards this treat;

√ The next important factor is time dimension. Organizations should value for individuals and their time, and set their programs that the average time spent by customers minimizes for meet their needs;

√ Effective loyalty programs should be simple and functional. They should have no ambiguity or condition. Of course, these programs must be supported by appropriate services, because otherwise it will fail and customer loyalty programs should be used in the an appropriate position;

√ It is necessary to increase the rate of customer loyalty and reduce customer aversion coefficient, indicators of provide superior service will also be considered. Therefore, it is essential to promote the culture of responsive staff in the order to create a spirit of criticism and customer-orientated in organization

√ should establish a relationship win - win between the organization and the customer and if the relationship is established that the parties feel that there are certain advantages to them and attract each other as two poles;

√ Effective business strategy towards trying to get new customers to replace lost customers.

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STUDYING THE EFFECT OF ORGANIZATIONAL COMMUNICATIONS ON GOVERNMENTAL ORGANIZATIONS CLIENT BEHAVIOR IN AHVAZ CITY

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ABSTRACT

Communication is the process of transferring information from a person to another person and understand it by receptor i.e. transfer and sharing in thoughts and believes and facts so that receptor perceive and understand them. As well as the client's behavior that most often effect on the cognitive aspects of it in their daily performances, will be addressed. This study aim is to investigate the effect of the organizational communication on the client's behavior of governmental organizations in Ahvaz city. The statistical sample selected among the employees and managers of governmental organizations from Ahvaz. Data were collected by using questionnaire in Likert scale and the data were analyzed by SPSS and LISREL software. After analyzing data, all hypotheses were confirmed and suggested that managers of governmental organizations try to promote the level of organizational communication among the employees. Motivation is a key factor in internal and external behavior. Appropriate rewards desirably can provide motivation among employees. Religious spirit and teachings and spirituality among employees with different occasions of prayer and spiritual happiness and sorrow are induced to employees.

KEY WORDS

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INTRODUCTION

New businesses are in the 21st century, recognized change as one of the main features. This situation stems from factors such as excessive competition, globalization and technological advances [1]. In order to survive and prosper in such a highly competitive environment, organizational sensing and responding to threats and opportunities is essential. Hence, one case that can help to organizations and their planning is organizational communication and client's behavior. In current unpredictable and variable era, advantage in competition is the main goal of any organizations. In such circumstances, the slightest slip can sometimes lead to a deterioration of the organization.[2].

Communication

Communication is the process of sending information through a personto another person and understood it by the recipient [3]. It means, transferring and sharing of thoughts and ideas or facts in such a way that receive and understand them [4]. In other words, communication is a process that person decide to obtain common concepts by exchanging symbolic messages [5].

Organizational Communications

Can be achieved a new concept by combination of two words of communication and the organization that is related or organizational communications. In organizational communication that one form is human communication, four features are considering, structured, task-based and being surrounded by an organization, in comparison with other forms of communication [6].

Organizational communication is the process by which a system set up for the exchange of information and meanings to different individuals and organizations inside and outside of their organization. [6].

Communication is a system for integration and common ground for the coordination and organization of activities and ultimately increases the productivity of the organization.

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Variety of organizational communication is[7]. Vertical communication in the organization, formal and informal communication Discussion reverence and customer satisfaction is one of the important issues raised in the state. In fact, honoring people and customer satisfaction is one of the seven Transformation program in order to transform the country's administrative system was approved by the Supreme Council office up and running[8]. Republic of Iran is the ultimate goal of honoring and it is a latent need among executive agencies that the Management and Planning Organization significant this need to all organizations.

For a Muslim employee, expert and managers, customer orientation and client tribute is not for instructions and circulars, but also is a human and religious duty: not an additional duty, among other tasks, but should be at the heart of things. Any service and striving for customer satisfaction, provides satisfaction of the God. For a Muslim, reverence to people considers as worship and it is the best way to approach God. Especially the client is deprived.Since human resources are the most valuable and important asset of any organization and production and the main source of competitive advantage and causing basic capabilities of any organization, it is one of the major organizational planning, human resources planning[9].

Organizations that have different clients in their interactions need to have a connection to their own dynamics within the communitymore and more. Nowadays, organizations are grappling with challenges [10]. Since the need to communicate in communication management is to manage the government agencies for the following reasons. Setting effective communication and reduce stress at workplace. Communication is a process that planning, organizing, directing, leading and control are done by it**.** So healthy and effective communication eliminates the stress in this way or at least reduces it [11].

Communication is an activity that managers use it to coordinate and appropriate their times.
When the director see such relationships in order to meet organizational goals, then it should be use of them and when they see the opposite and deterrent**,**it should be stop these relationships to de-stress.

The main objective of the research

Studying the effect oforganizational communications on the behavior of clients in governmental agencies in Ahvaz
Secondary objectives
Studying the effect of organizational communication on client's behavior of employees in governmental agencies in Ahvaz
Studying the effect of coworkers communication on the behavior of the client with fellow employees in governmental agencies in Ahvaz
Studying the communication with manager on the customer's behavior in government agencies in Ahvaz
Studying the effect of corporate communication policies on the client's behavior of employees in government agencies in Ahvaz
Studying the effect of corporate communications clients' commitment to Islamic morals in governmental organizations in Ahvaz
Studying the effect of client capability and expertise of employees in governmental agencies in Ahvaz
Studying the effect of having discipline in the client portfolio of employees in governmental agencies in Ahvaz
Studying the effect of respect for justice and fairness of client in government agencies in Ahvaz.

MATERIALS AND METHODS

The research hypotheses

The main hypothesis: organizational communication has a significant and positive impact on the client's behavior of employees in governmental agencies in Ahvaz.

Sub-hypotheses

Sub-Hypothesis 1: communication with colleagues has a significant and positive impact on clients' behavior of employees in governmental agencies in Ahvaz**.**

Sub-hypothesis 2: communication with managers has a significant and positive impact on clients' behavior of employees in government agencies in Ahvaz**.**

Sub-hypothesis 3: organizational communication policies have a significant and positive impact on clientele behavior of employees in government agencies in Ahvaz.

In this research study, in order to answer questions about the current status of the subject matter, need for information that is not already available. Therefore, this research is based on primary data that provide compilation, production, and collected in a survey manner. This study, in terms of the nature and purpose and the aim of research, is applied and in term of performance method is descriptive- survey and is carried out in two stages:

The first phase of preliminary studies to the issue of corporate communications and customer behavior, in order to further elucidate the problem occurs in this phase of the research of existing library resources such as books, papers and theses related to literature of the research were used. The second phase with respect to the need to derive a set of hypotheses in this research, by using the design of appropriate questionnaire, the necessary information is collected from managers and experts of the governmental agencies in Ahvaz. In this research, the conceptual model was used in which variables include**:**

Independent variables include corporate communications, including**:** Communicate with colleagues, managers and corporate communication policies and the dependent variable is the behavior of the clientele that includes**:**

Adhere to Islamic morality, capability and expertise, having discipline at work, respect for justice and fairness about clients.

RESULTS ANS DISCUSSION

Conceptual model

Conceptual model that according to an article published the impact of organizational communication, organizational behavior citizenship in 2014 in the Journal of Social and Behavioral Sciences at Elsevier**.**[12]is the author of the article**[Figure–1]**..

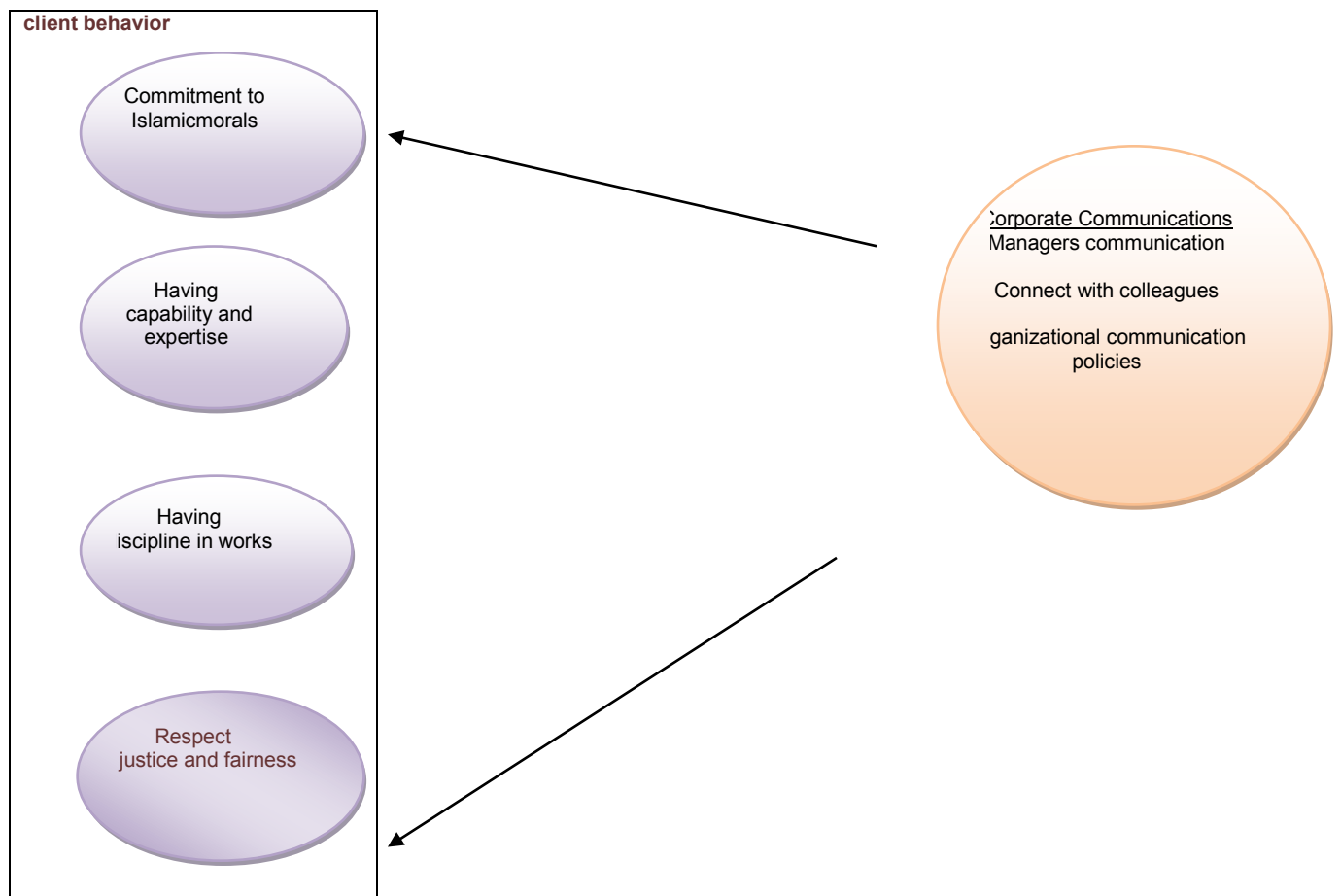

Fig:1. Article about corporate communications impact on citizenship organizational behavior, ps. 1096-1011)[12].
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B. Method of data collection (field, library, etc.)

In this method, due to the nature of the research, survey method will be used. Moreover, interviews with experts and subjective taking notes are used. Internet was used to find subjective articles. The tool to collect data will be questionnaire.

Number of questionnaires to find out the reliability and validity of them, after interviewing supervisors and consultants and experts in government agencies and their confirmation, will be distributed on the basis of statistical sample and after obtaining validity and reliable, questionnaires will distribute in total statistical sample.
C. Data collection tools (questionnaires, interviews, observations, test, fiche, table, sampling, laboratory equipment and information Bank and computer networks and satellite, etc.)

The questionnaire will be used to data collection. In this part of the survey method, whereby the production and collection of primary data are collected by means of a questionnaire. About reliability and credibility of the questionnaire, after design and drafting and consultation with advisors and experts, and their confirmation, we will distribute some of them as a base, which will be collected and analyzed to obtain valid and reliable questionnaire to be distributed among the samples. The questions will be answered in a package that will be graded on a Likert scale.

D. Data analysis method:

In order to do any research, accu
rate data collecting and appropriate methods to analyze the information essential basis for new information about the phenomenon under study .In this study to test the hypothesis, descriptive and inferential statistics were used to analyze the data. SPSS software and lisrel also be used.In this method, because the aim is to evaluate the effect of variables, so path analyzing and confident level 95% were used. Descriptive statistics to analyze the data and to obtain statistical indicators and the statistical data used to elicit results.

Reliability of research tools

When research tools have reliability that using it again in a similar study and obtained almost identical results. Also, the reliability of correlation between the scores on set of test scores and another set of equations, which are obtained independently on a defined subject [13] To calculate the reliability of measuring devices, various ways such as the reliability test, reliability in parallel, measures the internal consistency, reliability, compatibility between questions (Cronbach's alpha) and split-half reliability question was used. The alpha coefficient for each individual test questions with other questions compared. Cronbach's alpha coefficient ranges between zero (no reliability) to 1 (perfect reliability). And a tool where alpha is more than 0.7 of reliability is acceptable.

Any subset of questions for calculating a sample of the total variance should be calculated. In order to test reliability, Cronbach's alpha coefficient was used in this study. Cronbach's alpha coefficient of reliability assessment tools are based on the correlation matrix of items and reliability of the entire spectrum of measures. SPSS program in addition to the alpha (reliability of the whole) determine position of each item to their role in the decrease or increase of the total. In this tool has the answer to every question can be different numerical values.This means that if the observed score and the true subjects are to be permitted in any of the subjects, the squared correlation between these scores is called reliable coefficient. Cronbach's alpha for the variance sub-score of the questionnaire and the total variance calculated by using the following formula to calculate the coefficient alpha**[Table–1]**.

$$r\alpha = \frac{j}{j-1}\left(1 - \frac{\sum sj2}{s^{\square}}\right)$$

j= subset amount of questionnaires questions
sj2= Subtests variance of j
s2 = total variance test

Table: 1. Alpha coefficient reliability of the study

Questionnaire	Cronbach's alpha
Questionnaire of Corporate Communications	0/87
Client Behavior Questionnaire.	0/92
The entire questionnaire	0/90

As the table above can be seen in all cases, Cronbach's alpha is approved. Basically, Cronbach's alpha indicates good reliability and excellent all the way to closer questionnaires which indicated the reliability of the questionnaire is very good. Total reliability obtained 0.90 that indicated the reliability of the questionnaire is very good.

Descriptive Statistics

In this part of the statistical analysis, to determine the distribution of statistical samples in terms of gender, level of education **[Table–2,3]**.

Gender

Table:2. Of gender distribution of respondents

Gender	Frequency	The percentage of frequency	Cumulative frequency percent
Man	209	62.58	62.58
Female	125	37.42	100/0
Total	334	100/0	

Level of education

Table: 3. The frequency of the level of education of respondents

University education	Frequency	The percentage of frequency	Cumulative frequency percent
Diploma	87	26.05	26.05
Associate Degree	171	51.97	78.02
Bachelor degree	46	13.77	91.79
M.A.	30	8.21	100.0
Total	334	100	

Inferential statistics

After describing the variables in the sample, this section examines the assumptions and objectives set forth by statistical tests and using statistical analysis findings**,** this judgment is about the validity of the claims.

Kolmogorov-Smirnov test

At this stage of the study and other analyzes to check the hypothesis of normal or non-normal distribution of the data must first be identified. In this study, to verify the normal distribution of data Kolomogrov-Smirnov test was used. Because obtained sigis greater than 0.05, so can be concluded that all data distribution is normal variable **[Table–4]**.

Table: 4. significance level of Kolmogorov - Smirnov indicators

Components	Significant level
Contact partners	0.073
Contact Managers	0.053
Organizational communication policies	0.051
Client behavior	0.069

Explain and interpret the dependent and independent variables of the researchIn this section, to examine the relationship between independent and dependent variables of the study, to explain and interpret variables, with respect to the normal distributionand explain and interpret the variables of the test sample t-test value number 3 (test value = 3) and 95% (5% error) was used. In the above case, if the amount of P-Value is greater than 0.05, variables with test value (i.e. number 3) has not significant difference in the operating results of the average in the population, and if the value P- value is less than 0.05, variables with test value (i.e. number 3) has a significant difference.In this case, if the average factor is greater than 3**,** there were a powerful factor in the statistical population and if the mean factor was lower than the number 3 **,**there were just weak factor in the population**.** According to all these words can be seen that there is strong behavior of the clientele work (because the P-Value is less than 0.05, and the mean is greater than 3) in the population **[Table–5]**.

Table: 5. The result of one sample t-test for independent and dependent variables

Factor	T test	Average	Standard deviation	Significant level
Adherence to Islamic morals	7.741	3.2720	0.57563	0.000
Capability and expertise	13.354	3.4600	0.54463	0.000
Capability and expertise	2.120	3.0780	0.58161	0.035
Having discipline in the works	8.092	3.436	0.5680	0.000
Respect for justice and fairness	12.348	2.5211	0.58901	0.000
Contact Managers	11.054	3.0600	0.50463	0.000

The result of goodness of fitness test obtained from the LiezelSoftware, confirms the goodness of fit model **[Table–6]**.

Table: 6. results goodness of fitness test in standard mode

Chi square	Freedom degree	Significant level	RMSEA	GFI	AGFI	NNFI
599.36	488	0.00000	0.073	0.93	0.9	0.94

According to the LISREL calculated output, chi-square is equal to 599.36. The low rate of this index represents the amount of the small difference between the conceptual models with observed data of the research. Also, the amount of RMSEA equals to 0.073, which indicates a good fit. Admittance limit, RMSEA is 0.08; it is observe that the amount is smaller than this limit the amount of subsequent favorable fit. Whatever the amount is less, the model is a better fit.

GFI AGFI index and a measure of the relative amount of variance and covariance are jointly explained by themodel. As these values are closer to fitting the data would be more appropriate. These values are equal to 0.930.9 respectively that is perfect. Standard-fit index or NNFI also should be higher than 0.9 that in this study, the amount is equals to 0.94.

Research hypotheses analyzing

The main hypothesis of the study: organizational communication has a significant and positive impact on the behavior of client employees in government agencies in Ahvaz[Figure–2,3].
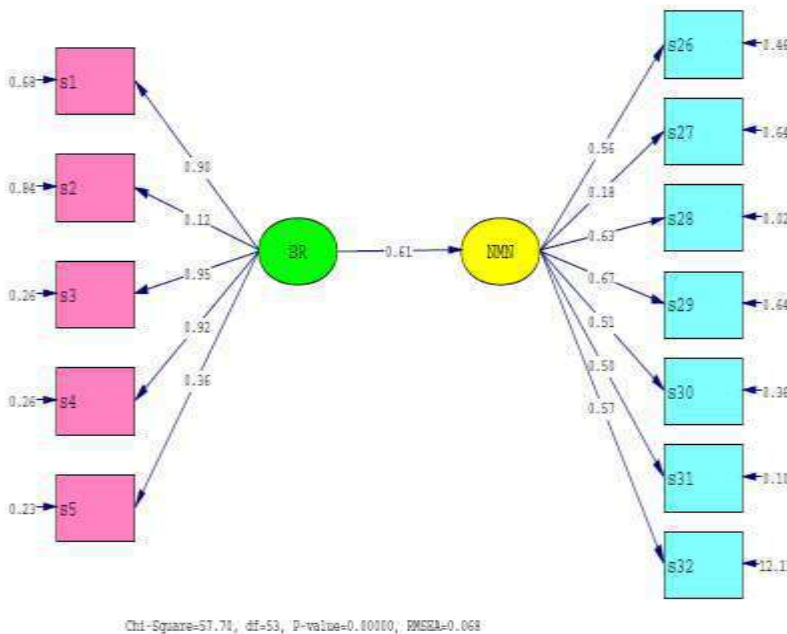

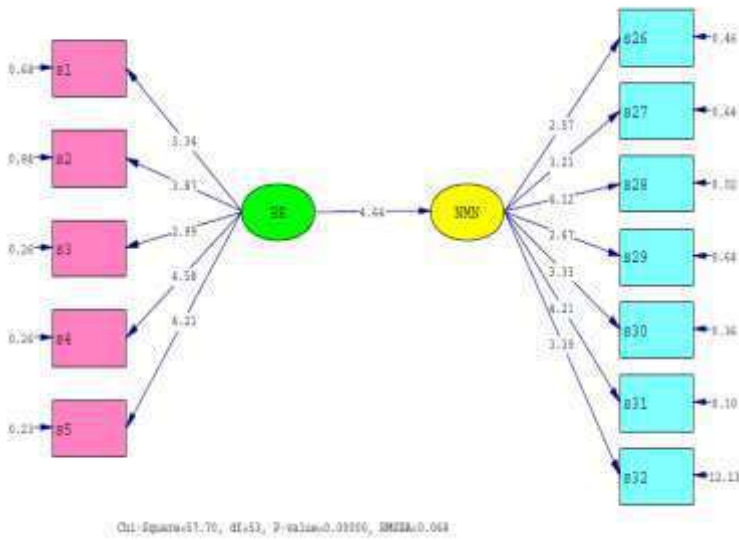**Fig: 2. Research model in standard evaluation**

Fig:3. Research model in significant numbers statue

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According to the structural equation, the amount of path coefficient is 0.61 that according to t test equals to 4.66> 1.96 at 0.05 significant level, the null hypothesis is rejected, the claim therefore been supported 0.95 researcher with confidence and with the error of 5 % we can say that: corporate communications client behavior of employees in government agencies has a significant and positive impact in Ahvaz.

Study secondary hypothesis 1: communication with colleagues, clients has a significant and positive impact on the behavior of employees in government agencies in Ahvaz**[Figure–4,5]**.
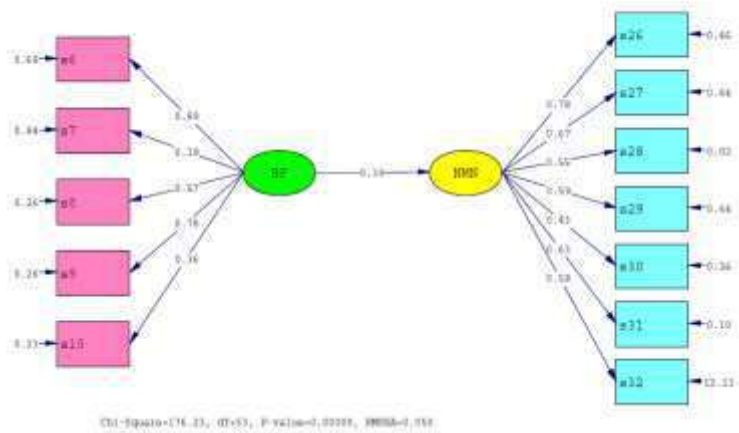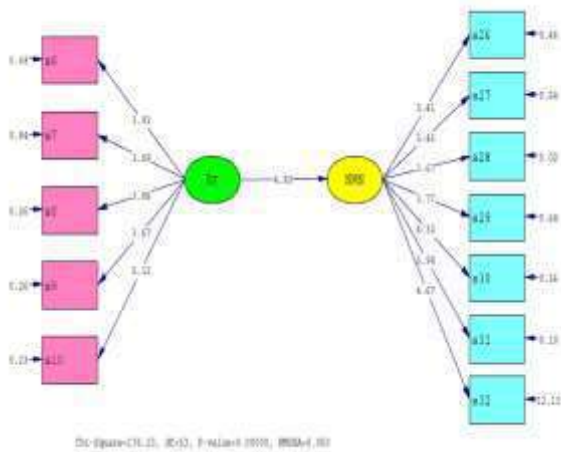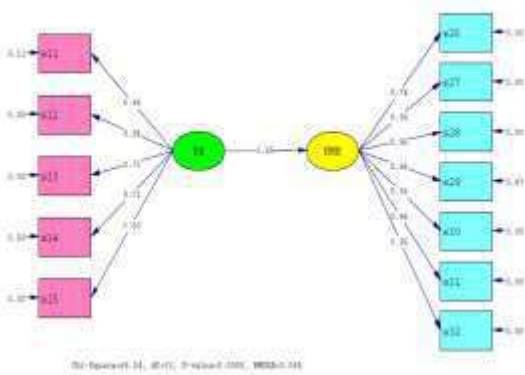
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Fig:4.Research model in standard evaluation

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Chi-Square=CTE.23, dE=52, P-value=0.00001, RMSEA=0.063

Fig:5. Research model in significant numbers statue

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According to the structural equation, the coefficient is 0.39 that according to t test 4.80> 1.96 at 0.05, the null hypothesis is rejected, therefore the claim has been supported at 0.95 coefficient level and with the error of 5 % can be said that communication with coworkers has a significant and positive impact on client's behavior of employees in governmental agencies in Ahvaz.

Study secondary hypothesis 2: the relationship with the client behavior management staff has a significant and positive impact in government agencies in Ahvaz**[Figure–6,7]**.

Chi-Square=04.14, dE=72, P-value=0.000, RMSEA=0.045

Fig:6. Research model in standard evaluation

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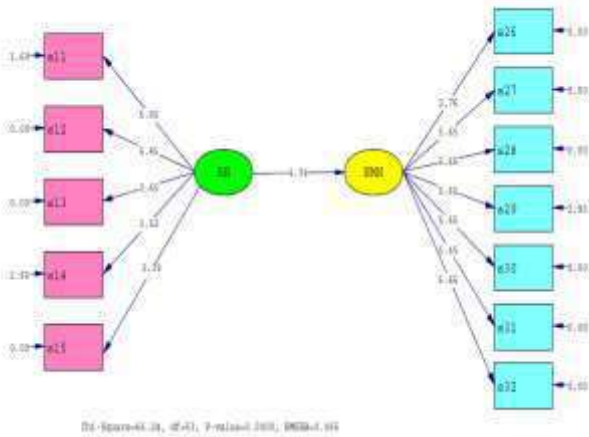
Fig:7. Research model in significant numbers statue

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According to the results of structural equation on the chart, the path coefficient is 0.65 that according to t test 4.34> 1.96 at 0.05 significant level, the null hypothesis is rejected, the claim therefore been supported 0.95 researcher with confidence and with the error of 5% can be said that communication with clients, managers, employees has a significant and positive impact on governmental agencies behavior in Ahvaz.

Study secondary hypothesis 3: organizational communication policies clientele behavior of employees has a significant and positive impact in governmental agencies in Ahvaz**[Figure–8,9]**.


Fig:8. Research model in standard evaluation

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Fig:9. Research model in significant numbers statue

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According to obtained Structural equation by the coefficient is 0.45 that t test 2.92> 1.96 at 0.05 significant level, the null hypothesis is rejected, therefore the claim been supported self-confidence of 0.95 and the error rate of 5% it can be said that organizational communication policies clientele behavior of employees has a significant and positive impact in governmental agencies in Ahvaz.

CONCLUSION
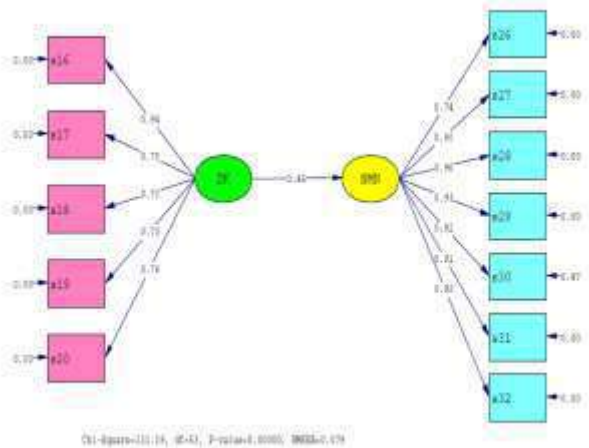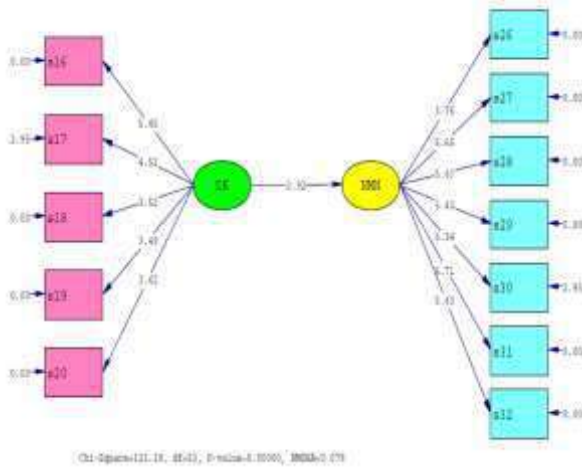
The conclusion of the first main hypothesis: organizational communication on client behavior has a significant and positive impact on employees in government agencies in Ahvaz. The conclusion of the first sub-hypothesis: communication with colleagues has a significant and positive impact on clients, employees' behavior in government agencies in Ahvaz. The conclusion of the second hypothesis: the relationship with the client behavior management has a significant and positive impact on staff in government agencies in Ahvaz. The conclusion of the third sub-hypothesis: organizational communication policies clientele behavior of employees has a significant and positive impact in government agencies in Ahvaz.

Recommendations:

According to the acceptance of hypotheses and regarding to conceptual model of the research, suggests that managers and directors in governmental agencies to:
1. Understand the status between current situation and the ideal situation of the index   and try to reduce this gap
Obtain equal competitive advantage with market share and continue the activity in order to expand the scope of organizational and strategic management of human resources
Induce religious spirit and teachings of religion and spirituality among employees in different occasions of prayer and spiritual happiness and sorrow are to staff and adherence to Islamic morals and capability and expertise among staff.
Use employees in their communication styles and pragmatic, people-oriented, process-oriented and idea oriented.

CONFLICT OF INTEREST
Authors declare no conflict of interest.

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MANAGEMENT

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INVESTIGATING THE EFFECT OF CORPORATE SOCIAL RESPONSIBILITY ON THE RELATIONSHIP BETWEEN CORPORATE GOVERNANCE AND MANAGERIAL RISK-TAKING IN COMPANIES LISTED ON TEHRAN STOCK EXCHANGE

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ABSTRACT

The object of this study is to examine the impact between corporate social responsibility on the relationship between corporate governance and managerial risk-taking in the listed companies in Tehran stock exchange. The locative domain of current research is all listed companies, and its time domain is during 2005 to 2015. The research method is a kind of regression, and 150 firms were selected as the statistical sample based on the systematic elimination method. The results indicated that there is a significant relationship between corporate social responsibility and managerial risk-taking in companies listed on Tehran stock exchange. There is no significant relationship between corporate governance and managerial risk-taking in companies listed on Tehran stock exchange.

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INTRODUCTION

Corporate governance system is a series of relation between executive management, board of directors, shareholders and other related parties in a firm which formulates the firms' goals with the aim of creating suitable structure, and determines the ways to reach them, the goals and monitoring on performance. This discussion is established based on agency theory and with regard to managers' social responsibilities and major shareholders .Aiming the first groups of stakeholders in firms (i.e. board of directors and institutional owners), corporate governance system looks for ensure board of directors and shareholders about their return on investment. Appropriate establishing of corporate governance mechanisms is a good action for optimum use of resources, enhancing accountability, transparency, fairness and maintaining the rights of all stakeholders. It ensures firms that they are effectively using their assets and also considers extent scope of stakeholders and the society act in .Better support from shareholders encourage firms to adopt more risks, but it increases shareholders value. For example, support from shareholders cause decreased personal interests, regarding risk avoidance. Therefore, there is a negative relationship between shareholders' support and risk-taking. John et al, found that there is a positive correlation between firm's risk-taking and firm growth with shareholders' support quality, and corporate governance leads to increased risk-taking. The current investigation is consistent with Ayadi et al. They examined the relationship between corporate social responsibility, corporate governance and managerial risk-taking and found that firms with high corporate social responsibility adopt more risks which difference in corporate governance structure highlights the relation. The main issue of the current research is to examine how corporate social responsibility effect on the relationship between corporate governance with managerial risk-taking in companies listed on Tehran stock exchange. In an investigation titled "social responsibility and restaurant firms stock value", Min Chang & Hang Hi studied the relationship between corporate social responsibility, systematic risk and financial performance (Tobin's Q) and showed that corporate social responsibility increased along with increased financial performance to enhance stock value, while weaker corporate social responsibility leads to decreased stock value and increased systematic risk.

Ayadi et al, investigated the relationship between corporate social responsibility, corporate governance and managerial risk-taking and demonstrated that firms with high corporate social responsibility take higher risks and the difference between corporate governance structure emphasize on this relationship.

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Daros et al, investigated the relationship between ownership structure, corporate social responsibility disclosure in financial institutions of Malaysia during 2008 to 2011. According to the made analyses, the results suggested that a centralized firm ownership structure in a financial institution can prevent from corporate social responsibility reporting in a way that management would disclose limited information about the relationship between corporate social responsibility for a few shareholders.

Yodin& Kamal Hassan examined the relationship among corporate governance disclosure and capital market risk in the listed companies in United Arab Emirates stock exchange. They examined 95 firms and showed that there a significant and negative relationship between corporate governance and capital risk market of the listed companies in UAE stock exchange. In contrast, there is no relationship between corporate governance disclosure and capital risk market in firms with low operational leverage.

Gregory et al, examined the relationship between corporate social responsibility and firms value with respect to free cash flows, risk and sale growth and concluded that corporate social responsibility leads to decreased risk and increased long-term growth. As well, corporate social responsibility-related risk has positive and negative influence on expected cash flows. Firm value originated from decreased systematic risk due to increased growth cash flows, low probability in cash flows shocks and not getting exposed to macro- economic condition.

MATERIALS AND METHODS

Hypotheses
- There is a significant relationship between corporate social responsibility with firms managerial risk-taking in companies listed on Tehran stock exchange.
- There is a significant relationship between corporate governance with firms managerial risk-taking in companies listed on Tehran stock exchange.

The research method
The research method is a kind of regression investigation, because the relationship existence and intensity of variables are considered here. The current investigation examines the relationship between the variables and looks for test the relationship with respect to the current conditions and based on historical data. The regression analysis (reincarnation analysis) is a statistical technique for measuring and modeling the relationship between the dependent and independent variables aiming predicting the dependent and independent variables.

The research statistical population and sample
The statistical population of the research includes all listed companies in Tehran stock exchange in period 11 during 2005 to 2015. The selected firms must have the following conditions:
1. Its fiscal year should end in march.
2. The firm should not change its fiscal year during the study.
3. Banks, insurance and investment companies are not considered, because their structure are different from other manufacturing firms.
4. The firms' data should be available.
5. They should have not experienced operating loss.

According to the imposed restrictions, 324 firms were selected using the systematic elimination method, and the final sample was 150 firms through De Morgan table.

Data analysis method and tools
In this research, the related data are collected through library method. In this method, book researches, Persian and Latin expert journals as well as internet in the form of financial statements, descriptive notes, weekly reports and journal of stock exchange.

Data analysis method
To estimate the efficiency of a regression model, inn this research, one the common effects, fixed effects and random effects model is selected using panel data by suitable test. F-Limer test is used for selecting between common effects and fixed effects methods. If fixed effects model is selected, Hausman test would be used to select among fixed effects and random effects models. Also, model's error term autocorrelation, heteroskedasticity and data normality would have been examined.To illustrate the description power of descriptive variables, to examine the significance of variables and to investigate the adequacy of whole

model, adjusted coefficient of determination, T-statistics and F-Fisher test are used, respectively. As well, statistical analyses are done through EVIEWS 7 and EXCEL software.

RESULTS

Durability test

A time series variable is durable when its mean, variance and autocorrelation coefficient to be fixed during the time. Durability is two types: weak and strong. We usually examine the weak case. If all torques to be fixed during the time, there is strong durability; but if first and second order torque are fixed, the durability is weak. Lin-Levene test is used in this research to examine durability. H0 indicates unit root of the variables.

Table: 1(1).Lin-Levene test

Variables	Statistics	Probability
Managerial risk-taking	-34.2393	*0.000
Corporate Social responsibility	-10.0871	*0.000
Corporate governance	-14.1270	*0.000
Financial leverage	-12.0180	*0.000
Growth	-312.583	*0.000
Firm size	-4.75042	*0.000
Firm age	-4.73401	*0.000

* 5% error level

According to the **[Table 1(1)]**, The H0 is rejected and all variables are durable.

Significance test of fixed effects method

Table: 1(2)F-Limer and Hausman test

Test	Test statistics	The amount of statistics	Freedom degree	P-VALUE
F-Limer	F	2.744352	(149.1493)	*0.0000
Hausman	Statistics	8.951371	7	*0.0162

* 5% error level

According to the tables (F and Hausman test), both obtained results are less than 5%, and the fixed effect method should be used in the related regression model.

The first hypothesis test

Table: 1(3). Hypothesis test

Variable	Estimated coefficient	Standard deviation	t-statistics	Significance level
Fixed	6.340764	0.201771	31.42562	0.0000
Corporate social responsibility	-0.019004	0.005796	-3.278668	0.0011
Financial leverage	0.020463	0.104578	0.195669	0.8449
Firm growth	-6.890110	6.580010	-1.017297	0.2951
Firm size	-0.028657	0.009175	-3.123414	0.0018
Firm age	-0.011999	0.003597	-3.336172	0.0009
Durbin-Watson	Coefficient of determinaton	The adjusted coefficient of determination	F-statistics	Significance level

| 1.54 | 0.867 | 0.82 | 3.921379 | **0.000 |

* 5% error level, **1% error level

Regarding the **[Table 1(3)]** since Durbin-Watson statistic test value is determined 1.54, there is no correlation between errors and regression can be used. The coefficient of determination of corporate social responsibility is -0.019; indicating there is a negative and adverse relationship between corporate social responsibility and managerial risk-taking, i.e. managers risk-taking is decreased in firms with high corporate social responsibility. The impact of firm size and firm age (control variables) is negative and adverse on firms risk-taking. In contrast, firm growth and financial leverage have no relationship with managerial risk-taking, due to their significance level is higher than 0.05. The adjusted coefficient of determination is 0.82, indicating the control and independent variables can predict 82% of the dependent variable (managerial risk-taking). On the other hand, due to significance level of F-statistics in 1% error level, it can state that the current model is statistically significant and suitable. Finally, due to significance level of t-statistics of the independent variable is less than 5%, it can say with 95% confidence level that H0 is rejected and H1 is confirmed. Therefore, there is a significant relation between corporate social responsibility and managerial risk-taking companies listed on Tehran stock exchange.

The second hypothesis test

Table: 1(4). The regression test and significance of the model

Variable	Estimated coefficient	Standard deviation	t-statistics	Significance level
Fixed	6.543940	0.269319	24.29811	0.0000
Corporate governance	1.671206	5.561006	0.300776	0.7636
Financial leverage	0.118232	0.083896	1.409263	0.1590
Firm growth	6.970110	1.061209	-0.656736	0.5115
Firm size	-0.053687	0.019931	-2.693617	0.0071
Firm age	-0.012549	0.004497	-2.790311	0.0053
Durbin-Watson	R	R²	F-statistics	Significance level
1.55	0.88	0.81	3.882731	**0.000

* 5% error level, **1% error level

Regarding the **[Table- 1(4)]**, since Durbin-Watson statistic test value is determined 1.55, there is no correlation between errors and regression can be used. The coefficient of determination of corporate governance is 1.671; indicating there is a positive relation between corporate governance and managerial risk-taking, i.e. managers risk-taking is increased in firms with high corporate governance. The impact of firm size and firm age (control variables) is negative and adverse on firms risk-taking. In contrast, firm growth and financial leverage have no relation with managerial risk-taking, due to their significance level is higher than 0.05. The adjusted coefficient of determination is 0.81, indicating the control and independent variables can predict 81% of the dependent variable (managerial risk-taking). On the other hand, due to significance level of F-statistics in 1% error level, it can state that the current model is statistically significant and suitable. Finally, due to significance level of t-statistics of the independent variable is more than 5%, it can say with 95% confidence level that H1 is rejected and H0 is confirmed. Therefore, there is no significant relationship between corporate governance and managerial risk-taking in companies listed on Tehran stock exchange.

CONCLUSION

Regarding the first hypothesis regression model, there is a significant relationship between corporate social responsibility and firms' managerial risk-taking in the listed companies in Tehran stock exchange. In this regard, Rashid (2015) in his research on the relationship between corporate social responsibility and firms risk found that high levels if corporate social responsibility lead to a definite risk rate for shareholders. Increased corporate social responsibility is correlated with increased risk. According to the second hypothesis regression model, there is no significant relationship between corporate governance and managerial risk-taking in companies listed on Tehran stock exchange. In this regard, Yodin& Kamal Hassan (2014) examined the relation among corporate governance

disclosure and capital market risk in the listed companies in United Arab Emirates stock exchange. They showed that there a significant and negative relationship between corporate governance and capital risk market in companies listed on UAE stock exchange. The following recommendations can be made based on the obtained results:

1.It can be suggested that the listed firms should pay attention to better transparency and accountability to stakeholders in order to reflect economic, social and environmental effects and regard them in providing corporate social responsibility strategies and their plans.

2.It is suggested that firms take an action for establishing a unit of independent committee into organizational structure to provide strategies, goals and corporate social responsibility plans.

3.It is suggested to firms to focus on corporate governance, and look for implementing and disclosing corporate governance in firms, because (1) corporate governance creates a framework for creating long-term reliance between firms and external suppliers; (2) it grants strategic thinking to a firm through appointing managers who have modern experiences and ideas; (3) it rationalizes management and monitoring on risks firms faced with; and (4) it restricts reliance on top managers and their responsibility through distributing decision-making process.

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STUDY OF BEHBAHAN CITY VELOCITY WAVES SHEAR

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ABSTRACT

Behbahan town as one af the important cities of Khuzestan province located in oil reservoirs range and power transfer lines because of sitting in boundary under the making –land units and zagrosprehole at front fault side of mountain that caused heavy earthy uakes with it is movement and also existence of occurousareas.study of previous earth quakes shows that local geology situations ,soil,sediments,and aerobic rocks on bed rock cause aggration of land movements arising of earthquake and it can be said that most importandfactorin final control of area earth quake to structure is building characteristics.sectional waves is animportand extraordinary property of soil which is strongly related to soil dynamic and trembling geoTechnic phenomenons and land movement that is caused by earthquake is by reason of sectional-waves spreading from rock bed towards soil upper layers,that ,irturn cause sectional trans formation along spreading.For acquisition to this assessment,different geotechnical and geology in formation related to Behbahan city Is collected and sectional waves rate is computed bypre send empirical relations

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INTRODUCTION

Earth movements which caused by earth quake is because of sectional waves dispersion from bed rock toward upper layers[1].to do widening carefully, we should spend much expenses to do special actions such as sounding about different limitations specially its financial costs, possibility of new soun ding did not exist in studied area and for knowledge of geo technical situation, we take action to collect results of accomplished laboratorial or open-air tests in considered erea, it is used governmental or private institutions geo technical reports such as accomplished studies for different projects like construction of residential buildings, determining under-ground water and ect. By reason of not being geo technical sunding, it is tried touse accomplished studies by oil companies located around Behbahan city ti achieve mire exact in formation from soil layers han profile. thus, researches data are used in analyze of soil layers response in earth quake interval resarch about 16 geotechnical sounding and wet is stusied, and these soundings involve different brigade to 20 meters depth map of geo technical sondding place is shown in figure1.of course, there are remarks in clarifying some of place geotechnical featurers that we will point them in next section. Dependingon extent of needed information ,degree of earth quake danger widening is divided in to less care arena(Grade-1),mean care(Grade-2)and muchcare (Grade-3) [2].Forlittle care widening basedon survey pressent data from damages resulting of past earth quakes, special information arena has little cost care.in mean care arena, much more geotechnical in formation is required them methods with little care and so necessary time and cost to do these studies compared to little care studies, is more.al o ,we can use geotechnical reports of private and governmental (teoropen-air test results in considered area.for much care (Grade-3) geotechnical ex cavations, to accoplishpentrtion Tests(CPT-SPT),sampling soil for laboratorial tests, geotechnical ways and collecting present in formation. From erea is necessary. expenses of this kind of earth quake danger widning is much,but exact widning is justifiable for places involovinghigt earth quake danger potential,and vital and sensetive present facilities and future of geotchical studies in behbahan city is seetional wave rate determination with least cost and make studies in shortest time,flattenig care with attention to quality ,and extend present and collected information ,is considered mean care.summary of gotechnicstuy results as sample for 1,2 and 16 sounding is presented in **[Figure-1]** .
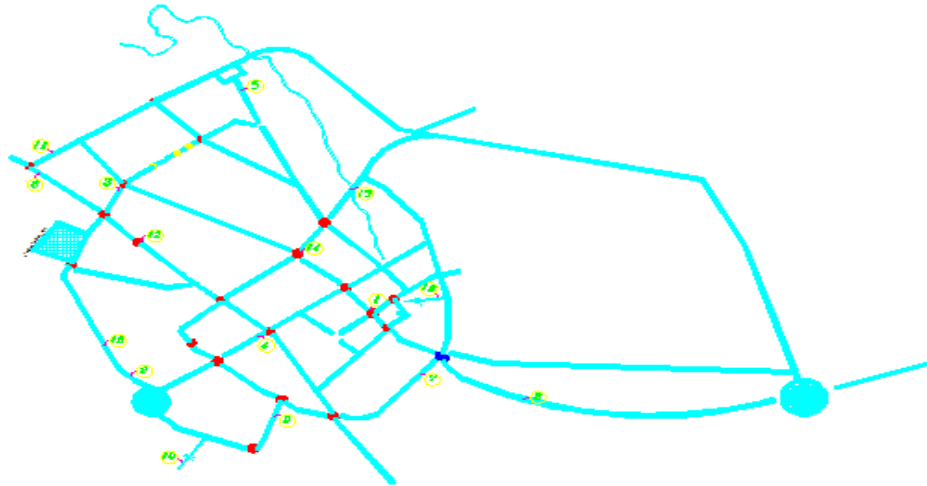
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Fig: 1. Place and number of sample geotechnical sounds in present study

MATERIALS AND METHODS

Geotechnical remarks of studied place

In [Table-1]with attention to ex cavation high costs for exact determination of behbahan alluvium thick ness,it is tried to collect in formation in this field.attained information ftom oil company and water and sewage organization,maron dam and also study of geology maps shows that behbahan soil thck ness is 250 to 35 meters. 2.2.Mass,ps=1/95g/cm3.of curse,it is tried that in every soudinganalyze,for 20 meter,depths downward,spt number to ascertain sectional wave rate estimated based upper layers of same soun ding.Because of that special weight change has not much effect on analyzing layers,special mass of soil with fixed extent,ps=1/95,in depths under 20 meters is supposed for all soundings.

measured number spt in geo techni studies is measured intermsof N10 (penration number based standard eneryyratio 10%).Nnumbers in prresenceunder ground water for depths nder 15 meters with assumpion that spt number of these depth measures besedonspt number upper layers,for N>15 adjust in form of N=N-15(N-15)(there is not sounding for number 1,2).

Table:1. Summary of granular test results,eterberyglimits,moisturepercentag and standard penetration number.

Borehole	Dep	w %	LL%	PI%	SPT	ρ_w	USCS
1	0-2	30	-	-	13	1.83	-
	2-4	-	23	7	50	2.2	GC-GM
	4-6	9.1	26	10	28	1.95	CL
	6-10	28	25	9	85	2	CL
	10-13	-	25	8	50	1.98	CL
	13-16	-	28	12	70	2	CL
	16-20	-	26	9	50	1.98	CL
2	0-3	28	25	10	50/11	1.85	CL
	3-6	28	23	7	50/15	1.85	CL-ML
	6-10	28	24	8	50/9	1.85	CL
	10-16	-	26	10	50	1.85	CL
	16-20	-	-	-	50	1.98	CL
16	0-1	-	-	-	13	1.83	CL
	1-3	8.3	36	15	13	1.67	CL
	3-4	10.6	34	15	13	1.69	CL
	4-5	10.6	34	15	14	1.71	CL
	5-6	16	34	14	14	1.75	CL
	6-8	22.7	33	13	14	1.87	CL
	8-14	-	-	10	14	1.95	CL

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RESULTS

Correlation between sectional wave rate (vs) and spt number

Earth tremblins that caused by earth quake is because of spreading swares that are known as sectional waves, cause sectional trans formation along spreading[2].with attention to particles Trembling direction,sectional waves are divided into two elements SV(movement in vertical surface) ,SH(movement in horizontalsurface. Sectional waves is an extra or denary property that is strongly related to soil dynamic phenomenon's and trembling geoterch nicetoday ,to determine sectional wave rate for soil layers that is one of the important parameters in addition to object module Gs',we can act in two ways:1-tests with little tension ,2-tests with high tension. Tests with low tension(tremblinggeophysics tests)usually act in tension rageswitch are not they are mostly in congestion under 0/001%Because of this ,most of them are wave spreading based theory in linear materials.most of them are related to measurement of volume waves rate that are easily connectable with soil module in coge.since,most sectional,conge,trembling geophisical tests produce less than 0/0003%measured sectional wave rates are usable for compuationGmax[1]:

$$G_{max} = \rho v_s^2 \tag{1}$$

using measured sectinal wave rates,are usually most reliable way to measure open-air numbers Gmax for a special layer of soil and trembling geophysic tests are usually used for this .for tedts of which present conge is less than 0/0001 such as open-air trembling tests G,result of tests is Gmax.highcongesation test are most common type formesuring conge properties abov soils such as resistance.so,their result is also connected tration test (spt) is oldest and most common open-air test geotechnicaplications.Number SPT is number of standard hammer strokes invilvin 64kg weght that is necessary for penetration 30 cm from standard to-floor tube spt in to soil.spt number is used for different aims such as internal friction angle θ and special weigt for soily.soe modification is made to lessen error.inherentsuchasGmax with penetration parmeterswich are relevant to more much conges,from in formation variance that take action according them,and also from attained results changes by different researchers.because of this ,utility of such relations is limitd to primary estimation Gmax[3].it is suggested some rempirical relations among vs and SPTnumbr.witch some of them is explainable as following:with city ,an cheapier method to determine sectional wave rate   by helping .sorrelation bed ween sectional wave rate and number of standard penetration strokes (SPT)is presented.Yapaneseresearchaerli(1992)[4]:

$$V_s = 82.8(N^{0.134})(D+1)^{0.223} \tag{2}$$

$$V_s = 84.5(N^{0.118})(D+1)^{0.246} \tag{3}$$

where D is considered layer and Nis standard penetration.
Relations(2) and(3) are forcl and ml/cl soils.
Hardian and richart (1963),reported obtained results from intenisfication column on otava dry sand.in these equations,vs is related to porosity ratio and applied effective pressure and explaain as following [1].

$$V_s = (19.7 - 9.06e)\sigma_0'^{0.25} \qquad \sigma_0' \geq 95.8\,KN/m^2 \tag{4}$$

$$V_s = (11.36 - 5.35e)\sigma_0'^{0.3} \qquad \sigma_0' < 95.8\,KN/m^2 \tag{5}$$

In above equations,$v_s$and σ_0'units are orderly interms of m/S and N/M^2. 60 average of lateral effective pressure equals with octahedral effective tension $\sigma_0' = \frac{1}{3}(\sigma_1' + \sigma_2' + \sigma_3')$ which in that $\sigma_1', \sigma_2', \sigma_3'$ are oredrlyminimum ,mean and maximum main efective tension of soil.Harian and richart suggested following redationbasdon different tests of grain soils.

$$V_s = (18.43 - 6.2e)\sigma_0'^{0.25} \tag{6}$$

Schmertmann(1978)msuggestedfollwing relation forsand:

$$V_s = 10\,to\,20 N_{60} \tag{7}$$

Seed etal(1986),and later,jamilkowski(1978),presented an approximate relation for sectional wavesrate of different soils.

$$V_s = C_1 N_{60}^{0.17} Z^{0.2} F_1 F_2 \tag{8}$$

C$_1$=said and colleaqus,jamiolkwskietal suggested 69 and 53/50
Z=dephwherespt number is obtained for 60%entergy and is intermsofm.

F_1-is age parameter,for alluvium deposit and old alluvium deposit is 1ind 1/3,respectively.
F_2=is determinaed for every kind of soil with regarding to following **[Table-2]:**

Table: 2.show kind of soil

	Clay	Fine sand	Med sand	Coarse sand	Sand & Gravel	Gravel
F_2	1.0	1.09	1.07	1.11	1.15	1.45

Yoshidetal (1988),presented following relating for different soils[5].

$$V_s = C_1(\gamma z)^{0.14} N_{60}^{0.25} \tag{9}$$

where y2=mean pressure and load in depth z intermsofKPa.
C1=is determined for every kind soil with attention to below **[Table-3]**

Table: 3. Show kind of soil

Soil	Fine sand	25% gravel	50% gravel	All soils
C_1	49	56	60	55

Bazeyar and coworkers presented following relation for iran soil (N<=50)

$$V_s = 134 D^{0.2} N^{0.3} \tag{10}$$

Where D is considered layer depth ,nis standard penetration.
Jafari and coworkers presented following relation for Tehran soil
Vs=100N0/53   (11)   vs=43/3 N0/03   (12)
(11)and(12) relations is for non-adhesive and adhesive soils, respectively.
Toniuchi(1982),Imai presented following relation for large-grain soils [5]:

$$V_s = 75.4 N_{67}^{0.351} \tag{13}$$

Go to and ohta (1978)suggestedfollowng relation[5]:

$$V_s = 94.2 N_{67}^{0.34} \tag{14}$$

this relation along with relations (15),(16),(17),(18) are relations that present secional wave rate vs h terms of nor spt for different soils:

All types of soils $\qquad V_s = 85.34 N^{0.348}$ (15)

Clay $\qquad\qquad\quad V_s = 85.6 N^{0.34}$ (16)

Sand $\qquad\qquad\quad V_s = 81.32 N^{0.34}$ (17)

Gravel $\qquad\qquad\ V_s = 104.6 N^{0.34}$ (18)

DISCUSSION

In addition to above cases,sectional wave rate vs inter msof soil depth H is presnted for different types of soil[6]:

$$V_s = 92.12 H^{0.339} \tag{19}$$

$$V_s = 78.98 H^{0.312} \tag{20}$$

$$V_s = 78.98 H^{0.312} \tag{21}$$

$$V_s = 178.1 H^{0.312} \tag{22}$$

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Relationas(19)to(21)are for ;all types of soil ,clay ,standard Gravel soils,respectively.

In all relations,sevctional wave rate is in terms of (m/s) and his interms of(m).

By placing relations (15)with(19),(16) wih(20),(17)with(21)and (18) with(22),following relations is achieved between H and N.

$$N = 1.244H^{0.974} \qquad (23)$$

$$N = 0.789H^{0.918} \qquad (24)$$

$$N = 1.905H^{0.918} \qquad (25)$$

$$N = 4.784H^{0.918} \qquad (26)$$

We can use relations (23) to (26) for pleaces that (N)SPT is not clear in soil depths.

(26)relation and formula bsedontype,depth,SPT number and soil geology period is presented in different forms which fitting to changes in these parmeters,sectionalwavee rate of soil layers is identified.As we can observe,most of heserelatiosre presented by japaneses.because of that obtained relations is more coonsistend with japan soil and jeologysituation,It is not used relations15 to 26.relations 11 and 12 which are special to tehran soil are not used.In **[Table-4]** relation Bto H .are used for compting sectional wave rate of cley soil and relationyto s are used for computing section al waves in lorg-grain soils relations A and I are used for both soils.relations T to W are special for sand soils.

Table:4. Presented relations for determining sectional wave of behbahan soil

NO.	SOURCE	RELATIONSHIP
A		$G_{max} = \rho v_s^2$
B	Lee (1992)	$V_s = 82.8(N^{0.134})(D+1)^{0.225}$
C	Lee (1992)	$V_s = 84.5(N^{0.118})(D+1)^{0.346}$
D	Seed et al (1986)	$V_s = 69N_{60}^{0.17}Z^{0.2} \times 1 \times 1$
E	Seed et al (1986)	$V_s = 69N_{60}^{0.17}Z^{0.2} \times 1 \times 1 \times 1.3$
F	Jamiolkowski et al (1978)	$V_s = 53.5N_{60}^{0.17}Z^{0.2} \times 1 \times 1$
G	Jamiolkowski et al (1978)	$V_s = 53.5N_{60}^{0.17}Z^{0.2} \times 1 \times 1 \times 1.3$
H	Yoshid et al (1988)	$V_s = 55(\gamma z)^{0.14}N_{60}^{0.25}$
I	Bazyar et al	$V_s = 134D^{0.2}N^{0.3}$
J	Seed et al (1986)	$V_s = 69N_{60}^{0.17}Z^{0.2} \times 1.45 \times 1$
K	Seed et al (1986)	$V_s = 69N_{60}^{0.17}Z^{0.2} \times 1.45 \times 1.3$
L	Jamiolkowski et al (1978)	$V_s = 53.5N_{60}^{0.17}Z^{0.2} \times 1.45 \times 1$
M	Jamiolkowski et al (1978)	$V_s = 53.5N_{60}^{0.17}Z^{0.2} \times 1.45 \times 1.3$
N	Tonouchi (1982)and Lmai	$V_s = 75.4N_{67}^{0.351}$
O	Ohta & Goto (1978)	$V_s = 94.2N_{67}^{0.34}$
P	Yoshid et al (1988)	$V_s = 60(\gamma z)^{0.14}N_{60}^{0.25}$
Q	Hardin, B. O., and	$V_s = (18.43 - 6.2e)\sigma_0^{r0.25}$
R	Richart, F . E., Jr. (1963).	$V_s = (11.36 - 5.35e)\sigma_0^{r0.3}$
S		$V_s = (19.7 - 9.06e)\sigma_0^{r0.25}$
T	Seed et al (1986)	$V_s = 69N_{60}^{0.17}Z^{0.2} \times 1 \times 1.07$
U	Seed et al (1986)	$V_s = 69N_{60}^{0.17}Z^{0.2} \times 1.3 \times 1.07$
V	Jamiolkowski et al (1978)	$V_s = 53.5N_{60}^{0.17}Z^{0.2} \times 1 \times 1.07$
W	Jamiolkowski et al (1978)	$V_s = 53.5N_{60}^{0.17}Z^{0.2} \times 1.3 \times 1.07$

CONCLUSION

When diffused volume waves resultiny.ffoult break arrive in land between different geology materials,thay reflect and refract.while waves spreading rate in less depth materials is generally less then materials under them, arieted rays that en counter with horizonal layer from tier.Usualy re flect in more vorticaldirection.when waves arrive earth surfase ,their numerous refractions cause their direction tobeperpendicular to earth surface.One of the importand parameters in trembling geo technic computer program and one dimension earth reply,is sectional wave rate by two ways .firstly,sechanal wave rate is directly determined by using trembling ways.In second way,sectional rate of soil layers is determinaed by use of empirical relations between sectional wave rate vs and number of standard penotration test storks spt.Because of that first method is expensive,second way is mostly used.insecond way ,sectional wave rate iof soil layers is deter minedbasdon test result spt and by present empirical relations betwennvs,spt.some of effective factors in determining these relations are geology age effects,depth and soil type.In this research,many relations is used to determine sectinnal wave rate,but best relation wich was consistent with our regien is selected and average is achieved.also ,new relations based on present relations for places where has not spt number or there is in low depth present by author.it should be mentioned that this type of relathan studied area ,so thay are not without error.

CONFLICT OF INTEREST
None

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FLOW CHARACTERISTICS AND FORCES ACTING ON PIERS WITH DIFFERENT GEOMETRIES IN RIVES AT MEDIUM AND HIGH REYNOLDS` NUMBER

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ABSTRACT

Each year, many bridges are destroyed in the world, due to neglecting the role of hydraulic factors in design. Three Important hydraulic reasons in bridge fracture are: unsuitable opening of aquifer, scour and immersing materials in water. Based on the studies carried out about bridge destruction, the flood flow making scour is known to be the main cause of bridge destruction. As the flood under the foundation or removes the bridge fabric. Due to the interaction of river with bridge structure, the role of hydraulic factors can not be neglected, therefore, it's necessary to estimate the maximum depth of scour around the piers to design the bridges piers economically and reliably. At present, the scientific principles of structural design of bridge pier has been well known. In contrast, there is not found any unique theory to estimate scour depth and the resultant force on bridge pier at high confidence. In this research, the effect of using vault and its diameter on the reduction of the forces acting on column and using rectangular and cylindrical columns at various speeds have been studied. This paper aims to investigate the water flow passing the bridge pier at various speeds. The three cylindrical, square and round-top wedge columns are used with flows passing at different speeds, the axial force on them are investigated. The contour of velocity, pressure and 3-D eddy behind the columns are taken into consideration. The range of Re is 10000 to 50000. The drag coefficient in all columns showed a decreasing trend versus Re. the drag of elliptical column had the lowest value. The greatest drag is related to square and column, the cylinder drag at high Re has a lower values than square and column which is due to pressure drag reduction from the movement of separation point to downstream resultingin smaller eddy behind the column and drag reduction.

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INTRODUCTION

Scour is a natural phenomenon happening from bed erosion and alluvial river side by water flow. Scour results in bridge fracture in flood flows. The presence of unstable flows and complexity of geometrical shapes of flow as the main reason of bridge fracture at flood, although immersed objects such as tress in the river flow can damage the bridge pier. One of the most important issues in the flow analysis and scour around bridge pier is flow separation influencing the drag force and fluctuates on bridge pier. The sharp and velocity of bridge pier have great effect on the size and power of eddies behind the column.

The research carried out on the forces on bridge pier and scour is taken to have long history. Inglis pona did numerous studies at water and electricity research center of india in 1938 and 1939 to study scour around bridge pier. This research was done in a flume with the sand of mean diameter 0.29 mm and became the basis of the relationship inglis pona.

Lee et al. (1961) studided the pier shape effect on scour depth. The rectangular pier makes the greatest scour depth. Making pier shape parallel with flow lines to reduce separation plays an important role in scour depth reduction in that in parallel cases, the power of horseshoe power decreases remarkable and less scour happens. If pier front is aerodynamic, the eddy power decreases.

Jane and Fischer (1979) the upstream landing number of bridge pier is important in scour.Therefore, in flows containing deposit, the scour around circular piers first decreases and then increases with the increase of landing number.

Melvile and Suferland (1988) determined that maximum depth of scour at cylindrical piers to be 2.46. This maximum depth decreases with the multiplication of factors while the scour is due to depositless water. Numerical

research by T-nishino et al. in 2007 on instability behind flow behind cylinder used combination of averaging methods and the method. [1]

MATERIALS AND METHODS

Computational conditions and methods:The basis of computation is on finite blum element method. The turbulent viscose and instable flow is expressed in navier-stokes 3-D equal to m.

$$\frac{\partial}{\partial t}\int_\Omega \rho \vec{V} d\Omega + \int_\Gamma \vec{V}(\rho \vec{V}.\hat{n})d\Gamma = \int_\Gamma -P\hat{n}d\Gamma + \int_\Gamma \bar{\bar{\tau}}.\hat{n}d\Gamma + \int_\Omega \rho \vec{F}_b d\Omega \tag{1}$$

$$\frac{\partial \rho}{\partial t} + \bar{\nabla}.\rho \vec{V} = 0 \tag{2}$$

In these equations, V is velocity and P is pressure,   is tension tensor equal   Newtonian fluid as   and   is volume force for mass unit. The numerical method is based on RI and Choi method and SIMPLE algorithm is used in velocity and presser couple.

The SIMPLE method used in this project is a prediction and modification method in that a guess is determined for velocity and pressure fields. As this guess is not necessarily true, it may not satisfy the continuity equation. After the following equations are extracted, pressure and velocity fields are so modified that the mass continuity is reinforced and finally the continuity equation is satisfied. Therefore, the modified fields of velocity and pressure satisfy momentum equation and continuity equation. The discrete equations of Navier and Stoke are expressed as the following:

$$a_P u_P^* + \sum_{n=nb} a_n u_n^* = S_x - \Delta\Omega \frac{\partial P}{\partial x}$$

$$a_P v_P^* + \sum_{n=nb} a_n v_n^* = S_y - \Delta\Omega \frac{\partial P}{\partial y} \tag{3}$$

$$a_P w_P^* + \sum_{n=nb} a_n w_n^* = S_z - \Delta\Omega \frac{\partial P}{\partial z}$$

Where   is the multiplication of momentum source power on volume unit in i direction in cell volume and a coefficients are calculated for central subtraction interpolation.[2] The discreted equation of x direction for two adjacent cells P and E in RI and choo is as follows:

$$u_P + (\frac{\Delta\Omega}{a_P})_P (\frac{\partial P}{\partial x})_P = (\frac{S_x}{a_P})_P - (\frac{1}{a_P}\sum_{n=nb} a_n u_n)_P \tag{4}$$

$$u_E + (\frac{\Delta\Omega}{a_P})_E (\frac{\partial P}{\partial x})_E = (\frac{S_x}{a_P})_E - (\frac{1}{a_P}\sum_{n=nb} a_n u_n)_E \tag{5}$$

In this research, instable three dimensional time equations of basic pressure and the turbulence model is   standard.

$$\mu_t = C_\mu \rho \frac{k^2}{\varepsilon} \tag{6}$$

The volume of , k & ε are obtained from semi-empirical equation, in which.

$$\rho \frac{\partial k}{\partial t} + \rho u_j k_{,j} = \left(\mu + \frac{\mu_t}{\sigma_k}k_{,j}\right)_{,j} + G + B - \rho\varepsilon \tag{7}$$

$$\rho \frac{\partial k}{\partial t} + \rho u_j k_{,j} = \left(\mu + \frac{\mu_t}{\sigma_k} k_{,j} \right)_{,j} + G + B - \rho \varepsilon \qquad (8)$$

That at that , C_1, C_2 and C_3 are empirical coefficients σ_k and σ_k are turbulent prantdl and Schmidt numbers, respectively. The terms $c_1 \left(\frac{\varepsilon}{k} \right) G$ and $c_2 \left(\frac{\varepsilon^2}{k} \right) G$ represent shear production ε and viscose ε delay .

The term $C_1 (1-C_3) \frac{\varepsilon}{k} B$ shows buoyancy effects. The term G represents turbulence kinetic energy from interaction between medium flow and turbulent flow field. The term B shows the buoyancy loss from density field of fluctuating field. [3]

Re number is defined as the following:

$$\mathrm{Re} = \frac{\rho v c}{\mu} \qquad (9)$$

in this formula, v is free flow velocity, ρ is free flow density, C is the reference level of body and μ is kinetic viscosity.

C_D is the drag coefficient .

$$C_D = \frac{D}{2 U_\infty^2 S} (9)$$

in which S is the surface covered by flow.**[Figure -1]** boundary conditions and computational grid .The coordinates system is Cartesian (x,y,z).To solve the flow equations in the field around a round-tip wedged pier, we need a computational grid which divides flow field into small computational units. Solving the flow equations in all the computational units simultaneously results in the solution of the whole field. The grid around the interested geometry is a computational grid of hedragon structure chosen as c-type **.** Ina profile of the solution grid is shown for structured grid around wedged column. As seen in the figure, the computation grid of hedradonal structure increases the accuracy in solving flow field and boundary layer estimation. It also helps to have better control on grid. [4]
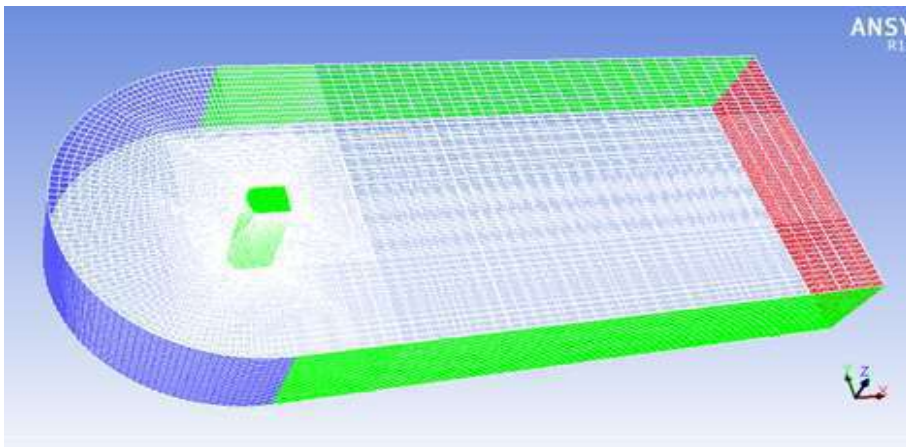

Fig: 1. 3-d grid view around wedged column

The independence of results from calculation grid are shown in Reynolds` number 60000 and the wedged column was obtained at range. in which d is the cylinder G_r diameter. For independency of results from time step, two steps of taken.

RESULTS

The results of solving flow around round-tip cylindrical column in fluid in different velocities

The contour of velocity, pressure, flow lines and eddy structure of flow at different Reynolds` number of 10000 are shown at **[Figure- 2]**.As seen, the maximum of velocity is at corner arc of flow in column.
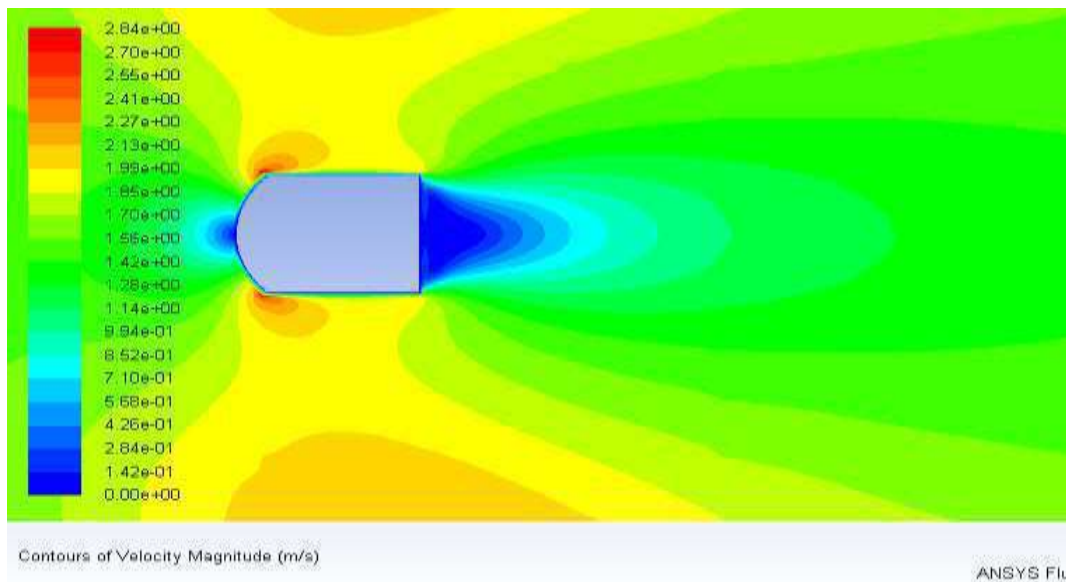

Contours of Velocity Magnitude (m/s)

ANSYS Flu

Fig: 2. velocity contour around wedged column at re=10000

The results of solving flow around cylidrical column in fluid in different velocities .As seen, the maximum of velocity is at the equinox of column. As seen in the figure, with the grid or organization , the border layer mash can be used more reliably, as in fig3 showing the organized mesh on border layer of pier making optimization and cell modification better than disorganized mesh , in turn increasing accuracy and reducing the error. As corner opposite the flow has lower velocity gradient , the flow does not separate from the corners while attached to the surface without any eddy. The maximum and minimum of velocity are increased and cover a larger area the same as eddy behind the object. [5 , 6]

The greatest pressure is on stagnation point and its maximum pressure and area increases. Increasing Reynolds` number increases the extent of eddy area the results of solving flow around square column in fluid in different velocities. [7, 8 , 9]

The mesh grid around cylindrical pier is seen in. As flow separation is important and there are formed specific trails behind the cylindrical piers , selection of grid and the number of points play important role in solving flow.

It is necessary to use organized mesh in border layer on pier to control increase or decrease the number of points on sphere surface and pier border layer so that separation site and forces are located carefully. shows the view of cylindrical pier on x-y direction. The symmetric conditions are in the top and bottom of the pier and wall conditions faraway and boundary conditions of velocity input and field exit were considered.

The volume of computational grid was about one million. In, the solution convergence and error are shown. [10 , 11]

DISCUSSION

The contour of velocity , pressure, flow lines and eddy structure of flow at different Reynolds`

number of 50000 are shown at **[Figure- 3].** the results of solving flow around square column in fluid in different velocities. the flow around square pier is symmetric and the maximum velocity occurs at sharp corner opposite the flow. Increasing Reynolds` number increases the velocity and enlarges the trails behind the column.

Fig: 3. Eddy around square column at re=50000

The results of solving flow around round-tip cylindrical column in fluid in different angles .the contour of velocity, pressure, flow lines and eddy structure of flow at different Reynolds` number of 50000 are shown.

As seen, the maximum of velocity is at corner arc of flow in column.AS seen, increasing Reynolds`

number increases the maximal velocity covering a larger area and due to flow velocity and flow asymmetry , the area of maximal velocity is different on both sides of cylinder. Also, maximum pressure is seen to be in front of column. Increasing the flow velocity increases the area of maximal pressure. As seen from the pictures of flow lines around the object , increasing the Reynolds` number makes the left eddy larger than the right one due to the physical shape of the elliptical cylinder , causing inequality of force coefficient in x and y directions .At attack angle of zero degree , increasing Reynolds` number increases velocity and pressure reaching maximum at Reynolds` number of 60000. The greatest pressure forms at the side opposite the stagnation point and maximum pressure covers a great area. The increase of velocity increases the value and extent of this area. The pressure in eddy area is negligible. [12]

The results of solving flow around cylidrical column in fluid in different angles. As seen, the maximum of velocity is at the equinox of column.As seen,,increasing Reynolds` number increases the maximal velocity covering  a larger area.The stagnation point occurs at pole opposite the flow and flow separation happens behind the cylinder , reduced by increase of velocity **[Figure-4]**. the separation moves downstream with the increase of Reynolds` number of 6000 .
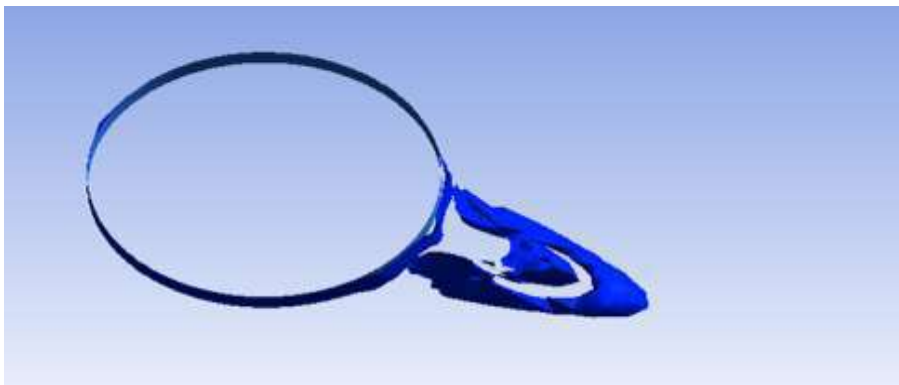

Fig: 4. Eddy around cylindrical column at re=60000

Comparison of drag change in columns
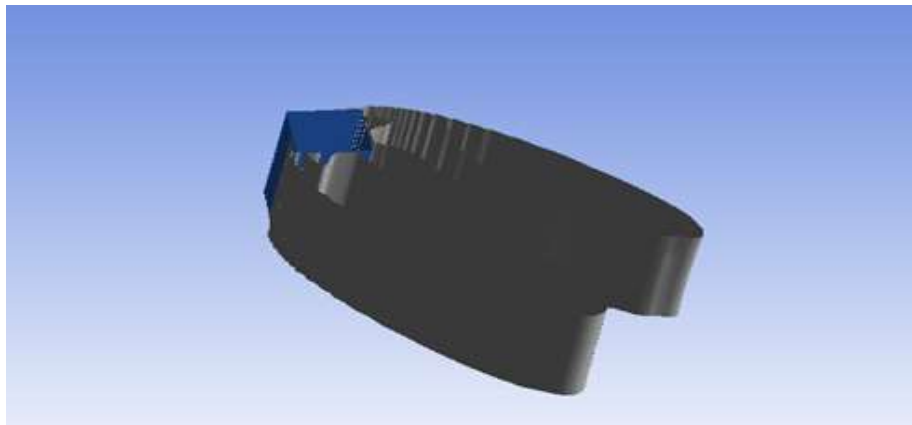
The changes of drag are seen in **[Figure-5]**.

Fig: 5. Rotation area behind the column detected by rotation at re=70000

CONCLUSION

Fluid flow on the different shapes of column ,square, rectangle, sharp-tip wedged-like , parabola and elliptic at different Reynolds` number were investigated .The contour of velocity, pressure ,flow lines and eddy structure behind the columns are represented. In all columns, drag coefficient decreased with the increase of Reynolds` number. One of the important results of this project is stating that friction drag has little effect on total drag. For wedged column at 45 degrees, flow separation and flow non - recontact to surface have effect on reduction of drag coefficient.

CONFLICT OF INTEREST
The author declares having no competing interests.

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FINANCIAL DISCLOSURE

None

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THE PROPERTIES OF FLOW AND FORCES APPLIED ON BRIDGE PIERS WITH DIFFERENT GEOMETRIES IN RIVER FLOW IN MEDIUM AND HIGH REYNOLD`S NUMBER IN DIFFERENT APPROACH ANGLES

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ABSTRACT

The reduction of river profile due to the plants or other factors can create scour .The narrowing of flow stream in the location of bridge makes the water level rise in bridge upstream and increase of flow velocity. Consequently, the potential of deposit carrying or the river bed erosion intensity increases. in these cases , the erosion continues until the flow profile increases to the extent that the capacity of deposit carrying decreases becoming equal to that in bridge upstream and finally the erosion fails to continue. generally, the scour is created in hydraulic structure downstream , bridge piers and almost wherever scattered flow intensity increases locally. downstream area of separation where there are small and big eddies and the pressure is fixed is said to be wake. In laminate layer where the velocity is low, it is more likely for separation to happen than turbulent border layer. To investigate separation and its consequences on the bridge pier playing an important role in decrease or increase of scour. The range of Re is 10000 to 50000. The drag coefficient in all columns showed a decreasing trend versus Re. the drag of elliptical column had the lowest value. The greatest drag is related to square and column, the cylinder drag at high Re has a lower values than square and column which is due to pressure drag reduction from the movement of separation point to downstream resulting in smaller eddy behind the column and drag reduction.

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INTRODUCTION

The scour and flow passing different geometrical forms of bridge pier have been paid attention to by many researchers. The formation of eddies behind the single and double cylinders becomes very important, too. Based on the studies of Larson et al (1961) pier form is an important factor which affects the scour depth because horse-shoe eddy depends on pier form. The rectangular pier makes the greatest depth of scour. Making the pier form compatible with flow lines to reduce the separation of flow decreases the scour depth so that in parallel case of pier form and flow lines, horseshoe eddy power decreases remarkably and less scour happens. If the pier front is in aerodynamic shape , the power of horseshoe eddy decreases and pier downstream is aerodynamic ,the eddy power decreases. [1 , 2]

Genes did some experiments on Harding model at scale 1/65 to determine the effect of upstream depth and diameter of bridge piers concluding that maximum scour depth occurs at pier tip and scour depth is 5 to 15% less around the pier while the ration of scour depth to flow depth has a direct relationship with flow speed. Flow depth of upstream has a direct effect on scour depth in pier tip. Parol et al, in their study on scour depth, understood if pier length is parallel with water flow , the scour depth will be minimum. With the increase of pier axis angle to flow line , the depth of scour will increase. In circular pier, the direct has no effect on scour. [3]

But if , instead of a pier, several piers are co-direction, the flow direction plays a role in increasing scour depth regarding the angle with pier axis. In this research , the fluid flow in rivers around the bridge pier is studied in different types. The flow analysis is carried out in different attack angles and Reynolds` number. [4]

MATERIALS AND METHODS

Calculation methods and conditions
The calculation is based on numerical method of finite volume elements. instable , viscous and unsteady flow is expressed in terms of 3-d equations of Noyer–Stoks .

$$\frac{\partial}{\partial t}(\rho V) + \nabla.\rho\,VV = \rho f + \nabla.\Pi_{ij} \qquad (1)$$

$$\frac{\partial \rho}{\partial t} + \nabla.(\rho V) = 0 \qquad (2)$$

In these equations , v and p are velocity and pressure, respectively. The second term on right represents the surface forces on volume unit, which are applied by external stresses including normal and shear stresses shown by stress tensor component. In this research, the 3-d time equations of basic pressure were used. [5] In the section of coupling velocity and pressure ,simple algorithm was used while in descreting the Least square cell based was applied and in pressure section ,the second order algorithm and in momentum part upstream second order descreting method were used. The discrete navier-stokes equations with simple methods was used as follows.

$$a_P u_P^* + \sum_{n=nb} a_n u_n^* = S_x - \Delta\Omega \frac{\partial P}{\partial x}$$

$$a_P v_P^* + \sum_{n=nb} a_n v_n^* = S_y - \Delta\Omega \frac{\partial P}{\partial y} \qquad (3)$$

$$a_P w_P^* + \sum_{n=nb} a_n w_n^* = S_z - \Delta\Omega \frac{\partial P}{\partial z}$$

In which s is the product of momentum sink on volume unit in direction I in cell volume and coefficients a are calculated for interpolation of central subtraction .the descreted equations of direction x for adjacent cells of p and e are as follows:

$$u_P + \left(\frac{\Delta\Omega}{a_P}\right)_P \left(\frac{\partial P}{\partial x}\right)_P = \left(\frac{S_x}{a_P}\right)_P - \left(\frac{1}{a_P}\sum_{n=nb} a_n u_n\right)_P \qquad (4)$$

$$u_E + \left(\frac{\Delta\Omega}{a_P}\right)_E \left(\frac{\partial P}{\partial x}\right)_E = \left(\frac{S_x}{a_P}\right)_E - \left(\frac{1}{a_P}\sum_{n=nb} a_n u_n\right)_E \qquad (5)$$

The turbulence model in this research is k-e standard. In eddy viscosity k-e , the chaos field is expressed in two variables:
a)   turbulent kinetic energy k [1] (relationship 6).
b)   The turbulence equation in this method is as following: in standard model of ε [2]   (relationship 7).
the values of k and e are obtained from semi-experimental methods:
:

$$K = \frac{1}{2}\overline{u_i' u_i'} \qquad (6)$$

$$\varepsilon = \left(\frac{\mu}{\rho}\right)\overline{u_{i,j}' u_{i,j}'} \qquad (7)$$

In which c1,c2 and c3 are experimental coefficients and σ_k and σ_k are turbulent   prandtl and schmidt numbers.

The terms $c_1\left(\dfrac{\varepsilon}{k}\right)G$ and $C_2\left(\dfrac{\varepsilon^2}{k}\right)G$ are used for shear production and viscose decay processes

$$\rho\frac{\partial k}{\partial t} + \rho u_j k_{,j} = \left(\mu + \frac{\mu_t}{\sigma_k}k_{,j}\right)_{,j} + G + B - \rho\varepsilon \qquad (8)$$

---

[1] Turbulent Kinetic Energy
[2] Viscous Dissipation Rate of Turbulent Kinetic Energy

$$\rho \frac{\partial k}{\partial t} + \rho u_j k_{,j} = \left(\mu + \frac{\mu_t}{\sigma_k} k_{,j} \right)_{,j} + G + B - \rho \varepsilon$$

The term ε shows the effect ε buoyancy. In this equation, the term $C_1 \left(1 - C_3\right) \frac{\varepsilon}{k} B$ represents the production G

turbulent kinetic energy from the interaction between the medium flow and turbulent flow field , as called shear production. The term B shows the buoyancy loss from fluctuating density field of flow. [6 , 7]
Exact relations for B and G are as follows:

$$G = -\rho \overline{u_i' u_j'} u_{i,j} \qquad (9)$$

$$B = \overline{\rho' u_i'} g_i \qquad (10)$$

For fixed density flows , the buoyancy term is obtained by Bozinsk approximation as follows :

$$B = \overline{\rho' u_i'} g_i \qquad (11)$$

Reynolds` number is defined as the following:

$$\text{Re} = \frac{\rho v c}{\mu} \qquad (12)$$

IN THIS FORMULA, v IS THE FREE FLOW VELOCITY , ρ is free flow density, c is body reference level

and y is the cinematic viscosity. Here, μ is considered to be drag coefficient C_D is the surface covered by flow:

$$C_D = \frac{D}{2 U_\infty^2 S} \qquad (12)$$

Boundary conditions and calculation grid the coordinates system is considered to be Cartesian (x,y,z). the grid produced is a structure grid of hexahedron with a million meshes. In **[Figure–1]**, different grids around the pier are shown. as seen, the produced grids are structured. The independence of results from calculation grid are shown in Reynolds` number 60000 and the wedged column was obtained at range, $-6d \le x \le 15d$, in which d is the cylinder diameter. For independency of results from time step , two steps of t= and t= , are taken. [8]
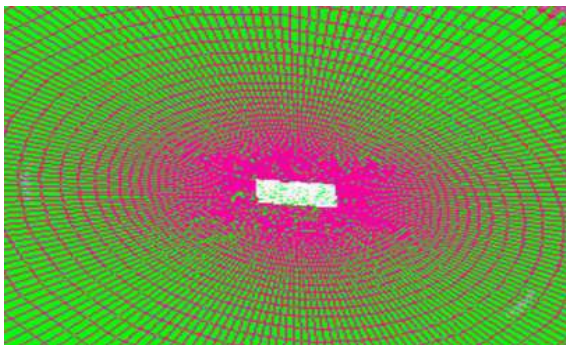
Fig: 1. view of grid around rectangular column

RESULTS
The results of solving flow around elliptical column in fluid in different angles
The contour of velocity, pressure, flow lines and eddy structure of flow at attack angle of 45 and different Reynolds` number are shown at . As seen, the maximum of velocity and pressure is at the pole and equinox of column.AS seen, increasing Reynolds` number increases the maximal velocity covering a larger area and due to flow velocity and flow asymmetry , the area of maximal velocity is different on both sides of cylinder. Also, maximum pressure is seen to be in front of column. Increasing the flow velocity increases the area of maximal pressure. As seen from

the pictures of flow lines around the object , increasing the Reynolds` number makes the left eddy larger than the right one due to the physical shape of the elliptical cylinder , causing inequality of force coefficient in x and y directions .At attack angle of zero degree , increasing Reynolds` number increases velocity and pressure reaching maximum at Reynolds` number of 70000. [9]

The contour of velocity , pressure, flow lines and eddy structure of flow at attack angle of 45 and different Reynolds` number are shown at [Figure–2].The flow around the column at 90 attack angle is symmetrical while the flow separates in the equinox area of column and eddy flow is produced. The maximal velocity is seen in the equinox of column , the maximal pressure in column front and stagnation point.Increasing Reynolds` number increases maximal and minimal velocity area. The separation area of flow becomes greater and a greater eddy sequence is formed behind the column. at Reynolds` number 150000 , the maximal velocity and pressure reach the maximum but the flow is symmetrical. [10]

Fig: 2. Detection of eddy change behind Column using equivalent surfaces of rotation and Re=150000 and angle
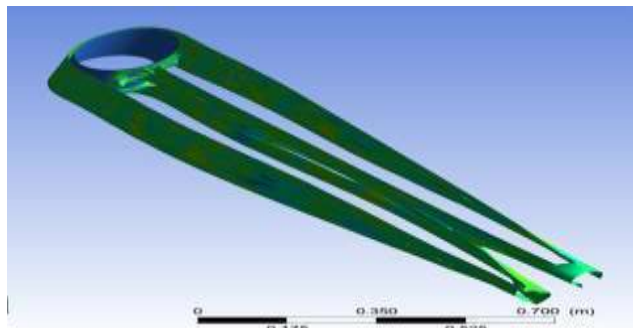
DISCUSSION

The results of solving flow around square column in fluid in different angles

The contour of velocity, pressure, flow lines and eddy structure of flow at attack angle of 0 and different Reynolds` number are shown at figure in below.

As seen in Reynolds` number 10000, the momentary flow around the object is symmetrical and maximal velocity and pressure are formed in the column central corner and 90 corner of the beginning of the column. The flow separates from the corner in the middle of square column and two eddy sequences are formed behind the column. Increasing the Reynolds` number to 20000 increases the maximal velocity and maximal pressure and the length of eddy area behind the column increases. The flow is momentarily symmetrical. As seen, increasing Reynolds` number to 80000 , the maximal velocity reaches its peak and its area spreads to downstream. The eddy flow behind the column becomes more spread. The pictures taken are based on momentary velocity showing the asymmetry of flow around the column but the mean values of flow have symmetry. [11]

At the attack angle of 45 at Reynolds` number 10000, the maximal velocity occurs at two corners of column front but the flow does not separate and it separates in two rear corners. The maximal pressure occurs at surface center of column front. Increasing maximal velocity increases the velocity and pressure covering a greater area. Increasing Reynolds` number to 20000 , the separation of flow at the front corner of column starts due to the increase of velocity gradient but again it sticks to lateral surface and separates in two ending corners. As a result ,a small eddy is formed in two beginning corners of wing. Therefore, increasing Reynolds` number to 60000 , the maximal velocity and its area spread and the flow separates in the sharp corner of column front and two eddies larger than the previous one are formed in the lateral surface while the length of the eddy behind the column increases. Increasing Reynolds` number to 100000, the velocity and pressure increase remarkably .The separation area becomes spread in the corners of the column front and the pressure in the eddy area decreases to the lowest. Four eddies in lateral surfaces and back surfaces enlarge covering more area. [Figure–3]
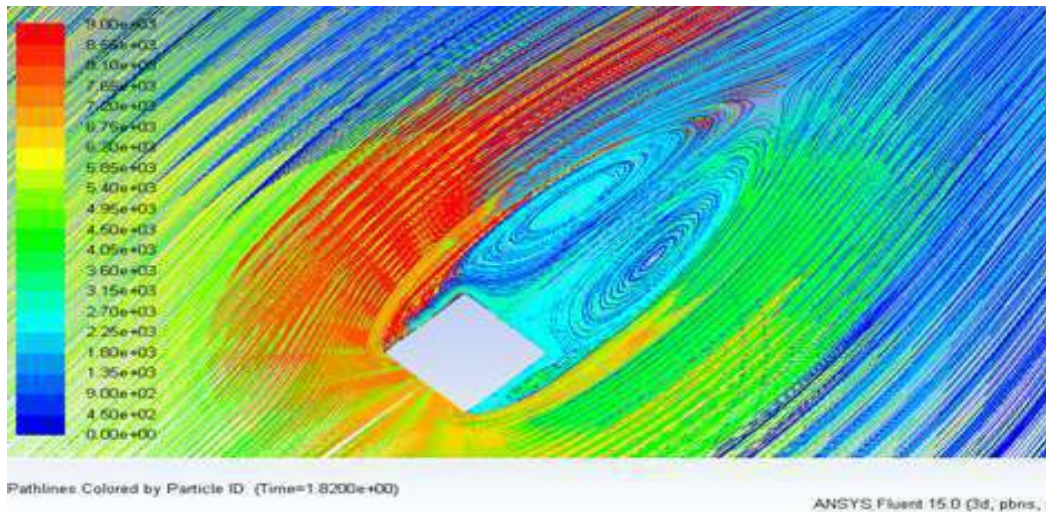
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Fig: 3. velocity contour around wedged column at 0 and re=10000

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As seen in at attack angle of zero, increasing Reynolds` number increases the maximal velocity occurring at two corners of wedge. As the velocity gradient increases in this place , there appears an eddy area behind the column in which velocity is very low. The highest pressure occurs at the top which is the stagnation point and the lowest at maximal velocity points.

Behind the wedge, the pressure decreases due to the eddy flow. Increasing Reynolds` number increases the maximal and minimal pressures. At attack angle of 45,the flow symmetry around wedged-like column disappeared relative to attack angle zero. The greatest velocity takes place at the tip of wedge and the ending corner. Increasing velocity increases the maximal velocity covering a greater area around the object. At the eddy area behind the object ,the pressure reaches minimum due to the eddy flow. The greatest pressure forms at the sides against the flow, the stagnation point, increased by the rise of velocity. as expected ,the pressure is negligible at eddy region. **[Figure–4]**
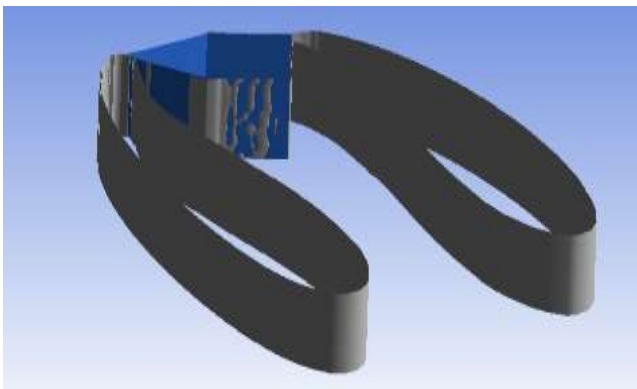
Fig: 4. velocity contour around wedged r column at 90 and re=10000

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The contour of velocity and pressure around the wedged-like column at attack angle of 90 is seen in . the stagnation point of the corner flow is opposite the flow and maximal velocity happens at two corners opposite the flow in a small space. The maximal velocity and the included space increase with Reynolds` number. At the eddy area of separated flow behind the wedge, the velocity is negligible and the greatest pressure is at the stagnation point, increased by Reynolds` number. From the flow lines around the column, at Reynolds` number 10000, the separation occurs at right corner gradually and the flow sticks the surface at the end of lateral surface and once again separates. Increasing the Reynolds` number raises the separation area in the right corner of front surface and an eddy is formed at the surface which becomes spread with Reynolds` number and is attached to the eddy area behind the object, increased by rise of Reynolds`. [12]

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The results of solving flow around round-tip cylindrical column in fluid in different velocities

The contour of velocity, pressure, flow lines and eddy structure of flow at different Reynolds` number of 10000 to 50000 are shown at at figer in below. As seen, the maximum of velocity is at corner arc of flow in column.

The results of solving flow around cylidrical column in fluid in different velocities .As seen, the maximum of velocity is at the equinox of column. As seen in the figure, with the grid or organization , the border layer mash can be used more reliably, as in showing the organized mesh on border layer of pierr making optimization and cell modification better than disorganized mesh , in turn increasing accuracy and reducing the error. As corner opposite the flow has lower velocity gradient , the flow does not separate from the corners while attached to the surface without any eddy. the maximum and minimum of velocity are increased and cover a larger area the same as eddy behind the object. the greatest pressure is on stagnation point and its maximum pressure and area increases. Increasing Reynolds` number increases the extent of eddy area the results of solving flow around square   column in fluid in different velocities.

The mesh grid around cylindrical pier is seen . As flow separation is important and there are formed specific trails behind the cylindrical piers , selection of grid and the number of points play important role in solving flow.

It is necessary to use organized mesh in border layer on pier to control increase or decrease the number of points on sphere surface and pier border layer so that separation site and forces are located carefully .shows the view of cylindrical pier on x-y direction. the symmetric conditions are in the top and bottom of the pier and wall conditions faraway and boundary conditions of velocity input and field exit were considered.

The volume of computational grid was about one million. the solution convergence and error are shown.

The contour of velocity , pressure, flow lines and eddy structure of flow at different Reynolds`

 number of 10000 to 50000 are shown at. the results of solving flow around square column in fluid in different velocities. the flow around square pier is symmetric and the maximum velocity occurs at sharp corner opposite the flow. increasing Reynolds` number increases the velocity and enlarges the trails behind the column. the results of solving flow around round-tip cylindrical  column in fluid in different angles. the contour of velocity, pressure, flow lines and eddy structure of flow at different Reynolds` numberof 10000 to 50000 are shown at figure in below.

As seen, the maximum of velocity is at corner arc of flow in column. AS seen, increasing Reynolds`number increases the maximal velocity covering a larger area and due to flow velocity and flow asymmetry , the area of maximal velocity is different on both sides of cylinder. Also, maximum pressure is seen to be in front of column. Increasing the flow velocity increases the area of maximal pressure. As seen from the pictures of flow lines around the object , increasing the Reynolds` number makes the left eddy larger than the right one due to the physical shape of the elliptical cylinder , causing inequality of force coefficient in x and y directions .At attack angle of zero degree , increasing Reynolds` number increases velocity and pressure reaching maximum at Reynolds` number of 70000. The greatest pressure forms at the side opposite the stagnation point and maximum pressure covers a great area. The increase of velocity increases the value and extent of this area. The pressure in eddy area is negligible.

The results of solving flow around cylidrical column in fluid in different angles .as seen, the maximum of velocity is at the equinox of column. as seen, increasing Reynolds` number increases the maximal velocity covering  a larger area. the stagnation point occurs at pole opposite the flow and flow separation happens behind the cylinder , reduced by increase of velocity [Figure–5]. the separation moves downstream with the increase of Reynolds` number.

Fig: 5. change in elliptical column drag coefficient versus Reynolds number at attack angle 90

Comparison of drag change in columns

The change of drag coefficient interms of Reynolds number for elliptical column at 45 is seen. Drag coefficient decreases when Reynolds number increases as the separation point moves downstream reducing pressure drag and the total drag. At Reynolds` number 60000 to 80000 , there is a less reduction of Reynolds` number at higher Reynolds` number .The increase of friction drag has more effect on total drag while in lower Reynolds` number , increase of friction drag is due to the increase of flow contact surface and velocity has less effect on total drag. drag coefficient change to Reynolds` number of elliptical column at attack angle of 90 is shown. The drag coefficient decreases with the increase of Reynolds` number which is due to pressure drag reduction from separation point movement to downstream on column surface. [13]

The change of drag in wedged column at attack angle of 45 is seen. as flow separation takes place at two corners opposite the flow on wedged column, the drag reduction is due to reduction of total drag on the object from the flow becoming more aerodynamic on the object. the change of drag versus Reynolds` number is seen in **[Figure–6]**.With the increase of Reynolds` number ,the drag decreases .The reduction of drag from Reynolds` number 30000 to 40000 experiences more gradient due to complete separation of flow which helps the flow around column to have more aerodynamic shape to reduce drag. for drag coefficient change on square column versus Reynolds` number at attack angle of 0, the flow separates from the two right angle corners opposite the flow unrelated to Reynolds` number. As the flow with stagnation pressure covers almost all the front surface, drag reduction from velocity increase is not tangible. The total drag reduction is due to total pressure behind the object due to eddy shape and increase of eddy length behind the object. at attack angle 45 drag decreases with increase in Reynolds` number continued to 40000.There is no remarkable change in drag of over re=4000 as the aerodynamic shape improves to re=40000 due to increase of eddy behind the object which reduces the drag. Drag coefficient change to Reynolds` number at attack angles 0 and 45 for square are presented. as seen, drag coefficient decreases with the increase of Reynolds` number. Drag coefficient change to Reynolds` number at attack angles 0,45 and for rectangular column are presented . as seen, drag coefficient decreases with the increase of Reynolds` number.

Comparison of drag change in columns

In rectangular column, coefficient change at three attack angle of 0,45 and 90 are compared. in which drag coefficient increases with the increases of attack angle.

From **[Figure–6]**, rectangular column drag is less than that of wedged column. from drag of square column is greater than that of rectangular column in all reynolds` number which is due to the trails behind the rectangular column reducing total drag and the effect of friction drag increase from increase of contact surface of flow with rectangular column has little effect on the increase of total drag. From, wedged column has the greatest drag coefficient at 45 relative to other columns as it has the greatest reference surface and elliptical column has the least drag coefficient due to pressure drag reduction.
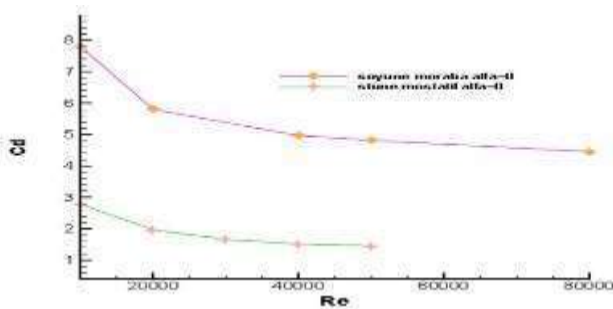
Fig: 6. change in square, elliptical and wedged column drag coefficient versus Reynolds number at attack angle 45

CONCLUSION

Fluid flow on the different shapes of column, square, rectangle, sharp-tip wedged-like , parabola and elliptic at different Reynolds` number were investigated .The contour of velocity, pressure, flow lines and eddy structure behind the columns are represented. in all columns, drag coefficient decreased with the increase of Reynolds` number. one of the important results of this project is stating that friction drag has little effect on total drag. For wedged column at 45 degrees, flow separation and flow non-recontact to surface have effect on reduction of drag coefficient.

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CONFLICT OF INTEREST

The author declares having no competing interests.

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ARTICLE

STUDDING THE REVIEW OF IRANIAN ARCHITECTURE AND URBANISM WITH TRADITIONAL ARCHITECTURAL APPROACH (CASE STUDY OF KERMAN)

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ABSTRACT

Traditional architecture in today's diverse societies has been discussed many different aspects of speech and debate is this study examines the architecture and urbanism problems with lack of attention to traditions and history, culture, climate generally and it can be said that traditional architecture as well as its importance in the community, causing some abnormalities such as fading sense especially in a city like kerman belonged to the ancient historical record deals. In this study, problems non-compliance with the rules of traditional architecture can be assessed and then components for a way out of this problem is given. Some of the factors and issues that are important in traditional architecture after all these topics have been discussed. Examined the importance of traditional architecture is partly the result of research will clearly.

INTRODUCTION

Problem statement

Check out some problems existing architecture and urban planning

In analyzing the root causes of problems and difficulties processing of numerous contemporary rchitecture and urbanism can be outlined, including most notably the lack of development and clarity of concepts and issues related to architecture and urbanism based on the culture and worldview of Iran. This is what the obsolete establish the Islamic world, has led to interest in making plans and Application of the definitions that are based on an alien world , alien cultural foundations also carried over[1].

In this regard, both the concepts and the main topics identified are: One of the issues that matter to the attention they need and have put together, but Anne definitions are taken from an alien culture and the other covers topics that are alien and that no effort has been made to work in the transformation of native them [1].

The impact of the culture of each region and its actions in the appropriate urban design, architecture and urbanism can help. Architecture and Culture Architecture familiar two words indicating the identity of the community is a delicate art and culture and these two always have been close and continuous relationship. Iranian brilliant architectural splendor centuries, has always been known for. Iran is the world's architectural grandeur on the apex of culture, art and civilization of this land has shone. One of the most powerful symbols of our culture and identity a mystery that the principal sign of our culture and civilization. Unfortunately, despite the glorious history of architecture, constructions torn apart in recent years in cities across the country.

Buildings apart from the faceless less indigenous and traditional Iranian architecture, in their eyes. Undoubtedly, lack of identity in Iranian architecture in the long term, Iran is a threat to the magnificent art and culture. For today's architecture, not past glory. Certainly, the architectural symbol of identity, culture and civilization of any country. So it is necessary drastic changes in the architectural design of buildings and general revision of the country, according to local architecture and cultural features as possible. In modern time, according to an alternative culture to the culture of ritual and supernatural the past earthly today.

Iran's indigenous architectural framework collapsed, because the architecture within the way of life and the relationship between human life and the life that comes from society. Architectural identity that reflects the values prevailing in the first, second, they are the values that society tends to Soma represents the cultural identity of its author. [2]

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Today, Iranian architecture, due to some aspects of alienation, the Western cultural invasion, and this causes The Iranian Islamic Iranian architecture in buildings more and more pale and diluted. Since the architecture and Style home an important role in shaping relations, temperament and culture household, the body many urban spaces one area of western culture and European buildings in Iran has emerged. Apartments are an example of architecture and non-traditional Iranian culture is incompatible with long-term surely cause social and cultural damage to Family and community will be Iran [3].

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Lack of identity and transmitting values: The first thing the human food supply after it is prepared to seek shelter that can settle in it. Housing smallest and most small physical embodiment of the relationship between human and environment and crystallization Space vital function of human occupation in his main roles. In psychology, human beings are part of personal identity by the house in which they live. Therefore, having its own identity and location of the most important issues in environmental psychology, anthropology and urban development is considered. Before creating a place to live, should the relationship between identity and place to know. We cannot set our environment call unrelated array of material things and cannot merely a receptacle for Social relations, without the physical dimension, we suppose [3].

Housing and the physical world is the human connection point; something tangible that subtle world of feelings, emotions, Joys and sufferings and memories and interests of individuals and, more importantly, reflect a culture of lies [3].

In other words, the first space system in which one is born and character of the house. Home is not just a building, but an institution that was created for complex targets. Since the construction of houses is a cultural phenomenon, it strongly influenced the shape organize cultural environment that belongs. Home as a physical mechanism, since it That is to say worldview, habits and customs and beliefs, and to produce and reproduce it helps, comparable to other mechanisms or social institutions such as education and religion [3].

Apartment house, because of the atmosphere and making it, many of its traditional functions such as home as a place of recreation and relaxation, a place to meet and party, the celebrations and rituals of Production and work and of course everything except sleeping quarters has shifted to urban areas. So in poetry "Our city, our home". Over the House "Metaphor" For the city, is Indicates and describes the "the truth ". Today, the bulk of the time spent living in cities and urban spaces and places are different. Consequently into the home for much less time and more houses have been converted into dormitories [3].

So, identity and socialization of children out of school houses, streets, cinema, TV, internet, parking, coffee shop, Library, gyms and stadiums, amusement parks, and so on. Ported and a completely different conception of the role of the former home there [3]. Perhaps the current architecture and urban planning major Iranian cities to be due to the involvement and influence of modern architecture west knew that the dichotomy between tradition and modernity issues will be discussed.

The problem arises when tradition and modernity to understand that in spite of their interaction with each other, as distinct from each other, Discussion of Categories tradition and the modernity of understanding and comprehending each of them, also suggesting that the size of the distinction between they have to understand and analyze the results of each have gone through. An important first step to enter this issue, understanding the concept of each of them by the other. Each time the importance of meaning that comes into the other leg. [4]

The breakdown of traditional society and distort the dubious distinction of modern society, In the first modernist features Western societies consider as a feature of modern society And then anything that photos of the day this is a developing country And developing countries are not doing independent investigation to see whether the country Features an image of modernity or not [4].

Definition of traditional architecture

Traditional architecture is part of the traditional arts with an emphasis on the principle of light as a central point, space organizes And on a regular geometry, the definition of appropriate structures for maintaining the hierarchy and layering in two parts Internal and external (indoors and outdoors) is formed And the same will also appear in the inlays [5].

Traditional Iranian architecture is the architecture that was based on principles and values rooted in spiritual beliefs Iranians and without historical discontinuity in practice, truth-seeking Iranian modernity in contact with other civilizations based worldview Iran, the culture and dynamics Water evolves and guide leading creators and urban architectural highlights. This timeless architecture and location attributes, and just how it is manifested according to the facilities. [6].

Traditional architecture sanctified knew his background, Because of his position in the hierarchy of sacred could see through it Architecture was connected world.

God knew that the architects of the architecture of blue dome and towering giant and the world and all the world is so beautiful and efficient creation that cannot be seen any weakness in it. After the beginning of imitation in architecture should also bounced, Monument to the People of God and God's people in order and efficiency and stand up against the order of nature, but part of it to be considered. In traditional society, architectural works, works artifact and not separate from creation; But it was considered minor. Hence, the architect did not know their art in this work build with nature, beauty and conviction of the divine edifice emulated. The universe must be coordinated so that the device architecture; But in this he knew that his work, in practice does not harm to nature and the landscape is not with nature. [7]

Definition of sustainable architecture

One factor that has always been considered the traditional architecture of the sustainability debate is clearly visible in the remaining works a brief definition is to be addressed. Issues relating to sustainability is so pervasive that many feel they no longer have a word for this purpose Green word used often because it is flexible connotation And is a symbol of the enduring nature is used. This is why many ecological use of the word. However, many others use the phrase responsive to the environment prefer the words may be different, however, is always the same goals [8].

Sustainable development in relation to construction activity and the built environment, often called sustainable building one or stable structure Is. The construction sector is one of the biggest social and economic sectors in Europe and with the built environment, to significantly changing the natural environment influence. Construction and the built environment, sustainable development as two key areas in the world, have been proposed [9].

The introduction of Kerman province

Located in Kerman province in southeastern Iran. From the north and from the south with the province of Khorasan and Yazd Hormozgan, Sistan and Baluchistan province of Fars province and the neighboring West. The area of this province About 175/069 Square kilometers and in between 55 Degree and 25 Minutes to 32 Degrees north latitude and 26 degree and 53 Minutes to29 degree and 59 Minutes east longitude from Greenwich meridian is located.

Kerman province after province is the largest province in the country (However, at the present time due to the conversion of the three provinces of Khorasan, Kerman province is the country's largest province) and about 11 percent of Iran's soil is derived. The province is one of the highest regions in the country, and its texture city with 2250 meters above sea level is the highest city of the province. According to the latest Kerman province, including 10 city divisions , 7 cities and 31 counties. Its city texture, Bardsir, Bam, Jiroft, Rafsanjan, Zarand, Kahnooj, Shahrbabak, Sirjan and Kerman [10].

Kerman is one of the five historic Iranian city of Kerman area of about 1,300 hectares and because of the size and population of Kerman city, the city is classified among the Iranian metropolises. Kerman, a population center and the largest city in the southern region of Iran is evil. Kerman in terms of industrial, political, cultural and scientific rid the city of the south of the country. (Wikipedia 2) importance of the topic:

Figure: Caption(?)

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- By studying the topic today seems to be due to the increasing importance of architecture, urbanism and its effects In human societies must develop in order to achieve maximum affinity with the tradition and culture of the society in all aspects Various attempts.

- Given that social harms associated with urban architecture and urban planning was important in many ways historic old cities such as Kerman can be even more development Then you must seriously be addressed in order to provide the best possible conditions sought.

- Reflecting on the importance of the issues related to compliance architecture, urbanism in various aspects such as houses, Malls, recreational and urban buildings in total with the culture and traditions of different communities, including areas where A traditionalist society cultural and ancient history are to be felt.

Literature research

In this section we will mention some of the literature research:

1. Maymandi Parizi in 1389 in his article an overview of the roots of the problems and the ravages of architecture and urbanism Iran's recent emphasis on Islamic world to examine the roots of these problems and the way out of it with regard to architecture Islamic tradition is concerned.

2. Asefi and Imani in the year 1393 in their article titled maker roots and the recognition of the architectural spirit of the past, Iran Over time, the originality of the past, just now. Causes abnormal changes in the architecture and its impact on architecture Contemporary Iran is examined and corrected it.

3. Rezai in 1392 in his article titled conflict between tradition and modernity in contemporary architecture and Iran to influence modern architecture Iran's conflict with traditional architecture.

4. Sadeghi P in1388 after his paper entitled Reflections on traditional architecture, concept, criteria and features traditional architecture is examined. Check out some sample shots with the principles of traditional architecture we work.

1- Construction of new homes by applying traditional architecture in the city of Yazd Ashke war

Figure: Caption(?)

2- Traditional Hotel Yazd:

Traditional Hotel Yazd is an old house, located in the heart of the historical texture of Yazd's traditional bazaar adjacent to one of Amirchaghmagh in Yazd, the Rashtian been times that were home to a prominent family. The house End date of its construction is the inscription on the house in 1212 AH, Is very beautiful and eye-catching architecture. 3 big and small courtyard, 4 input Different directions, aqueducts, underground, cool and quiet, louvers long and pleasant halls are all tales of dating and Originality home. Now the house has been restored as a 3-star hotel, , Has 24 rooms with different capacities, , 2 Dining area,1 Restaurant Nomad, 1 medium hall meeting, Coffee shop and restaurant at the top of the roof and beautiful view Wind is the old city. Example of combining modern facilities and traditional architecture. . Thanking you in advance the sense of hope a good time this traditional hotel in Yazd spend

Figure: Caption(?)

Figure: Caption(?)

3-Hotel Kapari city of Kerman Province Qaleh Ganj:

Treasure Castle, which is one of the most southern cities of Kerman province north of the city of Rudbar and Kahnooj and get to Iranshahr and the West Manoujan and south of the city of Minab and Jask city and leads Nick. The Castle Treasure Friendly people of Pars, Baluchistan, Arabs and Bakhtiari that despite many difficulties along the way they live coverage, Dialect and its rich culture attract many tourists to the region.

Figure: Caption(?)

Research purposes

-        Analysis of components of traditional architecture and the impact of its revival in architecture and urbanism Kerman

-Develop, organize and categorize and index component utilizes traditional architecture in city of Kerman
-        Urban design and deliver indicators based on traditional architecture and its importance for improving urban quality

Research hypotheses

-        The creation of urban design based on traditional architecture and the quality of urban identity there is a significant relationship.

-        Between traditional architectural design of the components and indicators in various sectors and its systematic organization and the influence there is an urban users.

- Be dependent relationship between it and improve urban vulnerability created.

MATERIALS AND METHODS

Method

The method used in this paper a combination of methods (heuristic) and (inductive) is. In this way the first The problems of non-compliance with regard to the traditions and culture can be studied logic in architecture and urbanism and Then consider these cases as well as traditional architectural elements suggestions for a way out of this problem Is.

Research findings

1. Combining architectural needs of urban squares with the spirit and engage with the environment, using the appropriate access, Colors, materials, shapes and elements suitable climate

Figure: Caption(?)

Ganjalikhan field of Kerman

2. Seyed Mohammad jafar Mirjalili features traditional architecture of Yazd deflector elements, Hall, orangery, pool house, room by Three-door and five-door outlined and added: Despite these elements together in addition to creating the right conditions for all seasons Induce a sense of relaxation and joy among residents of houses that unfortunately this architectural style is influenced by many factors, challenges it has been drawn. (Home of Mirhosseini in Rayen)

Figure: Caption(?)

The factors affecting the traditional architecture:

Light	Get maximum daylight and warmth
Materials	The materials used fit with the climate
Color	In accordance with the spirit of the
Elements	For example, according to windward climate in desert cities
Sort spaces	Achieve maximum unity and to suit a user
ways	Circulation coherent and simple
Accesshierarchy	Appropriate and in accordance with the privacy of
Allmans	Knowledge and identity-oriented

DISCUSSION & CONCLUSION

Similar research has been done in the traditional architecture in society generally considers all aspects of the issue Is And this study specifically of traditional architecture in the city of Kerman in addition to the old historic high Being a pioneer is immense potential in the field of architecture is examined. Geographic and climatic Kerman with some hints about the importance of this study suggest strategies for expansion Traditional architecture in the city of Kerman to the identity and maximum reflection in relation to architecture and society in this region.

CONFLICT OF INTEREST
There is no conflict of interest

ACKNOWLEDGEMENTS
None

FINANCIAL DISCLOSURE
None

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ARTICLE

AN EVALUATION OF SEISMIC VULNERABILITY OF BUILDINGS IN GANAVEH, IRAN

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ABSTRACT

Seismic vulnerability is a term used to indicate extent and amount of damages caused by natural disasters to communities, buildings and geographical zones. Evaluation of seismic vulnerability of existing buildings is actually a kind of damage potential prediction under probable earthquakes. The ideal method is to conduct a series of statistical analyses on sufficient sample sizes of similar subjects exposed to the same seismic performance. The present study aimed to evaluate seismic vulnerability of buildings in Ganaveh, so that by studying the current situation of buildings and determining their qualitative vulnerability, one can provide general guidelines to improve existing conditions. In this study, after referring to seismicity and geological characteristics of Ganaveh, recognizing different seismic vulnerability evaluation methods and selecting the appropriate qualitative evaluation procedure according to construction conditions of the case study area and field data collection method, seismic vulnerability of various types of buildings in Ganaveh were presented in bar charts independently using the modified Arya method. Based on the results obtained from the present study, most of masonry buildings, in particular in district 1, and some of steel or concrete structures have the risk of serious structural damages under moderate to major earthquakes. Therefore, immediate vulnerability assessment and retrofitting are highly required.

INTRODUCTION

Evaluation of seismic vulnerability of existing buildings is actually a kind of damage potential prediction under probable earthquakes. The ideal method is to conduct a series of statistical analyses on sufficient sample sizes of similar subjects exposed to the same seismic performance [1]. Reviewing the available literature indicates that various methods have been used to evaluate seismic vulnerability of buildings and major arteries. Due to construction conditions in our country, poor quality of design and incorrect implementation of many existing and under construction structures, and according to conducted studies, one can see the fact that vulnerability assessment methods used in industrialized countries cannot be directly applied in our country. The earliest activities in this field date back to the early 1970s, when non-linear models were proposed to identify structural behaviors. Whitman (1972) was the first researcher who proposed a method for estimating seismic damage. In his method, the ground motions were modified in Mercalli scale and earthquake damage was expressed as the ratio of repairing cost to rebuilding cost (damage ratio). Bigassu and Bresler (1979) proposed an earthquake damage assessment method using the semi-static structural analysis. Two variables including final deformation capacity of elements and impact factors are taken into account for applying these methods to real buildings. The proposed methods in the previous studies have defined structural damage as the ratio of demand or response under the desired earthquakes to ultimate capacity of the structure. Kabanassu Penitu (1997) in a study referred to ground motions as the potential of damage and provided a better assessment of seismic risk by estimating parameters associated with damage expressed in terms of ground motion energy. Using neural networks is one of the most modern methods in vulnerability assessment which has been widely studied today [2]. In Iran, there are not enough studies on evaluation of seismic vulnerability of buildings. Shakib et al. have studied conventional vulnerability in the country. In this paper, we studied four types of buildings including steel, concrete, unreinforced masonry and complex buildings, which constitute a significant percentage of the country buildings. In this study, detailed buildings technical information forms were filled out for six different regions of the country using field data, and then performances of conventional buildings in recent earthquakes were evaluated to determine vulnerability of four types of conventional buildings. Studies conducted by Hassanzadeh and Nateq Elahi can also be cited in this field. They evaluated vulnerability of a 4-storey steel structure using nonlinear dynamic analyses. Razani and Bornaei proposed a practical model which has been used in Ahvaz. These researchers are completing a major theoretical and empirical model, under EVA, naming Iranian seismic vulnerability model. Tehranizadeh et al. investigated damage assessment procedures and retrofitting methods for masonry buildings against earthquakes and provided criteria and methods for seismic retrofitting. Nateq Elahi and Motamedi evaluated vulnerability of reinforced concrete buildings using nonlinear dynamic analysis. They designed a number of similar reinforced concrete buildings with the same plan and characteristics but different floors in two categories, with shear walls and without shear walls, based on the common structural codes in Iran. Then, they used IDARC program for nonlinear analysis. Seismic capacity of reinforced concrete buildings has been studied quantitatively by generalizing results obtained from the samples, and eventually their seismic vulnerability has been investigated by analysis of results. Barakchian (1999) presented a study entitled "A quantitative vulnerability assessment of important steel buildings against earthquakes using inelastic analyses". Shakib et al. carried out studies entitled "Vulnerability evaluation of conventional urban buildings" to recognize construction conditions in different cities of Ilam province in terms of seismic resistance. Such studies are recommended for other cities of Iran due to the seismicity of most parts of the country.

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General Specifications of Ganaveh
Geographical Location

Ganaveh is a city located at 150 km from Boushehr with a population of about 120 thousand people. This city is located in the vicinity of some known faults such as Kazeroon fault, Misan fault etc. Because of locating in Zagros zone and having Folded Zagros tectonic properties, Ganaveh has a major share in the seismicity regional division. Locating in Alpine-Himalayan belt, movement of Saudi Arabia shield toward Iran, the lack of isostasy despite homogeneity in the crust structure, and partly tectonics related to formation of salt diapirs are the most important tectonic factors affecting seismicity of this zone. These factors, during the history, led to the exposure of this zone among the high risk zones which are classified as the middle class in terms of quality (with a relatively high risk domain and destruction) and in the 7th intensity class in terms of quantity.

Characteristics of Ganaveh Different Districts
 To obtain perfect urban planning based on spatial structure of Ganaveh, the city is divided into seven districts within legal limits. Table 1 indicates population and area of each district. District 1: A region with an area of 240.5038 hectares and a population of 20,419 people located at the southwest of Ganaveh. This district is actually the oldest district of the city.

Table 1: Population estimation and area of case studies in Ganaveh

District	Estimated population in 2006	Area in hectares	Gross population density (persons per hectare)
1	20419	240.5038	85
2	16575	225.2990	73.6
3	9217	257.6772	35.8
4	2521	184.56	13.7
5	18164	258.1929	70.3
6	20997	219.7227	95.6
7		148.7788	
Total	878775	1534.7365	57.26

District 2: District 2 had an area of about 225.2990 hectares and a population of 16575 people in 2006. The gross population density was equal to 73.6 people per hectare. Total urban and rural per capita in this district was equal to 135.93 m2 and 89.2284 hectares of this district have been assigned to residential land use. Residential land use per capita in this district was equal to 53.83 m2.
District 3: This district is located at the southeast of Ganaveh with an area of 257.6772 hectares and a population of 9217 people. The gross population density is equal to 35.8 people per hectare. Total urban and rural per capita in this district is equal to 279.57 m2.
District 4: This district is located at the northeast of Ganaveh with an area of 184.5619 hectares and a population of 2521 people. The gross population density is equal to 13.7 people per hectare.
District 5: This district with an area of 258.1929 hectares has a population of about 18146 people. The gross population density is equal to 70.3 people per hectare and 92.2958 hectares of this district have been assigned to residential land use. Residential land use per capita in this district is equal to 50.86 m2.
District 6: This district with an area of 219.228 hectares has a population of about 20997 people. The gross population density is equal to 95.6 people per hectare.
District 7: This district is located at the northern part of the city with no inhabitants and an area of approximately 148.7788 hectares. About 51.0956 hectares of this area have been assigned to urban context lands and 6832 hectares have been assigned to non-functional lands.

Table 2: The most important earthquakes occurred in the vicinity of the case study in the twentieth century

The year of earthquake event	The depth of the epicenter (km)	Magnitude in richter
December 1925	149	5.5
May 1927	16	6.2
July 1927	33	6.2
February 1930	33	5.5
May 1930	-	5.8
July 1931	33	5.6
January 1950	6	5.5
February 1956	47	5.7
March 1956	36	5.8
April 1958	43	5.5
August, 1964	28	5.6
April 1972	33	6.9
April 1976	24	5.7
February 1985	37	5.3

Seismicity of the Region
Review of the history of past earthquakes records provides one of the fundamental data to assess the risk of earthquakes and seismicity. Table 2 presents characteristics of several earthquakes occurred in the region. Because of locating in Zagros zone and having Folded Zagros tectonic properties, Ganaveh has a major share in seismicity regional division. Data recorded in 85-year period (1985-1990) were used to study seismicity of the region.

MATERIALS AND METHODS

Vulnerability Evaluation Methods
During an earthquake, destruction or any structural damages begin from structural weaknesses. After failure of the first weak point, the other points are threatened by the earthquake forces. Therefore, detection of structural weaknesses, or in the other word, weakness detection standard is the first step, and then assessing appropriate repair and retrofitting methods, or in the other word, treatment standard is the second step in structural vulnerability studies against earthquake risks. Over the last twenty years increasing efforts have been conducted to assess seismic resistance of buildings. However, due to the diversity of buildings and the complexity of the effects of various parameters on seismic vulnerability of buildings, it is very difficult to develop standards for weakness detection and treatment. Based on the studies conducted around the world, structural vulnerability evaluation methods can be divided into two groups: quantitative and qualitative methods [3].

Arya Vulnerability Evaluation Method
This method which is proposed by professor Arya, shows the damage ratio of each structural parameter and finally the entire building total damage ratio based on different earthquake intensities. In this method, just like the other qualitative methods, the corresponding questionnaires are filled out first. Type of land, type of structural system and quality of construction are some of the main parameters in these questionnaires. A damage coefficient is assigned to each of the parameters for intensities of 7, 8, and 9 MSK. Then damage ratio which is a value between 0 and 1 is obtained using a mathematical relation between damage coefficients. By classifying damage ratios, one can estimate the building vulnerability. Arya vulnerability evaluation method, just like the other qualitative methods, has classified tables containing the main vulnerability parameters and indicators as well as damage coefficients; so that damage coefficients can be calculated for different earthquake intensities. In this method, damage coefficient between 0 and 4 has been determined for 7, 8, and 9 MSK intensities in terms of the indicator effect on structural damage. In the Arya method, amount of damage is determined as a value between 0 and 1 using building damage ratio which is the sum of damage coefficients effects via damage ratio equation. The damage to the building is determined based on the obtained damage ratio. The following four degrees of damage can be considered in estimating building damages [4]: - More than 75%: failure and loss, possibility of deaths; - 25% to 75%: high damage, forced evacuation of the building, reconstruction is required; -25% to 50%: moderate damage, requires repair after evacuation of the building; - Less than 25%: low damage, the building is usable, minor repairs without the need of evacuation. The following table shows how to calculate damage coefficients for buildings with given indicators and parameters. The main indicator parameters include: 1- land slope, 2- type of land, 3- type of structural system, 4- type of floors system, 5- the building height, 6- openings and walls, 7- cornices, 8- form of plan, 9- facade, 10- construction quality. Among the 10 mentioned parameters, parameters of 1, 2, 5, 6, 8, and 10 are not associated with structural elements and just affect structural behavior during earthquake events. These parameters are graded so that if an earthquake with an intensity of 7, 8, 9 MSK occurs in the region, the effect of each parameter on the structural behavior can be determined. Damage coefficient of L_i is used to obtain the 4 remaining parameters which are associated with structural elements, and if they are damaged, they will be loss, or damage the other elements. For instance, walls or columns collapse leads to collapse of roof or the entire building and reconstruction will be needed. These parameters are calculated using F coefficients which reflects cost of each parameter to the cost of the entire building. These four parameters and the related F coefficients are as follows: type of structural system: $F_4=0.6$; floor system: $F_5=0.33$; cornices (turrets, balconies): $F_7=0.04$; façade materials: $F= 0.03$. F coefficients are selected approximately and user can change them based on building cost estimation. However, the sum of these factors should not be greater than 1 (representing the total cost of the building). Damages to each parameter in the second class vary in the range of 0 to 4. When this range is divided by 4, the results will vary between 0 and 1. Here, 0 reflects no vulnerability or lack of damage and 1 means collapse or damage of the entire building. The total damage of the building can be calculated as follows: After determining the parameters of F_i and L_i, damage ratio of the entire building can be calculated from equation (1).

$$LR = l_1 \times L_2 \times L_5 \times L_6 \times L_8 \times L_{10} \times \frac{1}{4}\left[(F_3 \times L_3) + (F_4 \times L_4) + (F_7 \times L_7) + (F_9 \times L_9)\right] \leq 1$$

LR values should vary between (0 to 1) so if a value more than 1 is obtained from calculation, we should consider it as 1. Finally, vulnerability of the building against earthquakes based on LR damage ratio values obtained from the above equation are evaluated as Table 3 and 4. Due to compatibility of the Arya method with the local construction requirements, it can be completed with expert studies. To achieve accurate results, paragraphs of evaluation table are modified as follows:
A- LA1 paragraph is added to the table for foundations which are not considered in Arya method. In this

paragraph,

suitability of footing beam in intensities of 7, 8, 9 MSK is considered as affectless and the effect of its inappropriateness is also considered as a ratio of 1.05 just in intensity of 9 MSK. Non-implementation of foundation or footing beams which have a significant impact on the lack of structural resistance are considered as 1.05, 1.10, and 1.15 for the intensities of 7, 8 and 9 MSK, respectively. The lack of foundation resistance will cause structural weaknesses and serious damages to the building. Therefore, this parameter is considered as the main parameter in the LR coefficient group.

$$LR = \left[L_1 \times L_2 \times L_3 \times L_6 \times L_8 \times L_{A1} \times L_{A2} \times L_{10} \times \frac{1}{4} (F_7 \times L_7) + (F_9 \times L_9) \right] \leq 1 \tag{2}$$

Table3: Structural vulnerability based on damage ratio in the quick qualitative method

Diagnosis (damage level)	Variation range LR
Probablity of collapse	LR>0.75
High vulnerability	0.50<LR<0.75
Moderate vulnerability	0.25<LR<0.50
Low vulnerability	LR<0.25

RESULTS

Results of Seismic Vulnerability Evaluation in the Case Study

Based on municipal divisions, Ganaveh is divided into seven districts. Sampling in each of these districts was performed based on the percentage of existing buildings types (in terms of structural system, number of floors, etc.). To evaluate building performance, we need some criteria to assess building safety. Before analyzing obtained technical data, buildings were divided into seven categories based on their structural systems including: steel structural buildings with braces, steel structural buildings without braces, masonry buildings without footing beams. To assess and compare, different distribution systems of Genaveh residential buildings are presented in table 6 in terms of the type of structure and building materials. Field data, after being analyzed, were presented as bar charts for districts 1 and 2, which are the higher dense districts. These charts are plotted based on damage index in earthquakes with intensities of 7, 8 and 9 MSK. The vertical axis in these charts indicates damage index varying between 0 and 1. For engineering judgment about vulnerability of each building, the vertical axis is divided into intervals of 0.25 according to Arya method criteria. Criteria related to the seismic vulnerability are presented in the paragraph. Most masonry buildings are very vulnerable under the influence of major earthquakes. Most masonry buildings without rewinding will collapse in a moderate earthquake. In some masonry buildings, with only horizontal footing beams, collapse is probable even during a moderate earthquake. Most masonry buildings with horizontal and vertical rewinding and proper implementation, collapse is probable even during a moderate earthquake.

Table 4: The modified Arya table [5]

Damage index	Parameter and its coefficients	Sub-parameters	Damage coefficient (L)		
			Intensity of 7	Intensity of 8	Intensity of 9
(L1)	Land slope (degree)	0-15	1	1	1
		16-30	1	1	1.1
		>30	1	1.1	1.2
(L2)	Type of land	Hard (I)	1	1	1
		Medium (II)	1	1.1	1.2
		Soft (III)	1.1	1.2	1.3
		Fluent (IV)	1.3	1.5	2
LA1	Foundations and footing beams	Appropriate foundations and footing beams	1	1	1
		Inappropriate foundations and footing beams	1	1	1.05
		Non-implementation of foundations and footing beams	1.05	1.10	1.15
(L3)	Type of structural system F3=0.6 If the facade cover does not exist L9 must be removed F3=0.63	Steel structure with braces	0	0.5	1
		Steel structure without braces	1	1.2	2
		Reinforced concrete structure	1	1.2	2
		Masonry wall without brick rewinding	1.2	2.5	3.5
		Masonry wall with horizontal brick rewinding	1	1.5	2.5
		Masonry wall with horizontal and vertical brick rewinding with appropriate implementation	1.5	2	3
		masonry wall with horizontal and vertical brick rewinding with poor implementation (in terms of integrity and rewinding	0	1.5	2.5
		Masonry wall with horizontal and vertical rewinding with concrete blocks and proper implementation	1	2	3
		Masonry wall with horizontal rewinding and concrete block	1	1.7	2.7
		Masonry wall with horizontal and vertical rewinding and poor cement blocks (in terms of integrity and rewinding)	1.5	2.5	3.5
		Masonry wall with cement block without rewinding	1.5	2.5	3.5
		Complex	2.5	3.5	3.5
(L4)	Floor system F4 = 0.33 (if the cornices are appropriate or do not exist, L7 is removed F4=0.37)	Arch percussionist with appropriate support	1	1.5	3
		Arch percussionist with inappropriate support and arch foot	2	3	4
		Block joist with appropriate general, support and rebar cover conditions	1	2	3
		Block joist with inappropriate general, support and rebar cover conditions	1.5	2.5	3.5
		Reinforced concrete slab	0	0	1
		Wooden roof with light coating	0	1	1.5
		Wooden roof with building materials	2	3	4

		Light metal ceiling with horizontal bracing	0	1	1.5
(L5)	Building height	One-storey masonry building with steel and concrete structure up to three floors	1	1	1
		Two-storey masonry building with steel and concrete structure higher than three storeys	1.1	1.2	1.3
(L6)	Wall opening with building materials	Satisfying	1	1	1
		Exceeding	1.1	1.2	1.3
(L7)	Cornices F7=0.04	Satisfying	0	0	0
		Exceeding	1	1	11
(L8)	Irregularity in plan with altitude	Regular	1	1	1
		Irregular	1.1	1.1	1.1
(L9)	Façade F9=0.03	(Brick / stone) stationary	0	0	0
		(Brick / stone) non-stationary	1	1	1
		Concrete facade	0	0	0
		Mud	0.5	0.5	0.5
(L10)	Building quality (according to age of the building and implementation conditions)	Good	0.6	0.6	0.6
		Medium	0.8	0.8	0.8
		Bad	1	1	1
LA2	Construction development and discontinuity seam considerations in buildings of over 4 floors.	Interaction between behavior of the new building and the behavior of the original building High (in this case the building is evaluated as weak)	-	-	-
		Medium	1.1	1.3	1.5
		Low	1	1.1	1.2
		No development	1	1	1

Table 5: Distribution of Ganaveh housing units based on type of structures and the main materials

Type of structure and materials	Number	Percentage
Steel structure	171	1.32
Reinforced concrete	1269	9.8
Brick and iron or stone and wood	7127	55
Brick and wood or stone and wood	2321	17.9
Cement block	1563	12.07
Brick or stone	220	1.7
Wooden	28	0.22
Brick and wood	37	0.28
Brick and mud	4	0.03
Other types	37	0.29
Undeclared materials	24	0.19
Undeclared type of structure	152	1.2

Semi-steel buildings may collapse in moderate earthquakes with intensity of 8 MSK and receive high damages in earthquakes with an intensity of 7 MSK and totally have the worst vulnerability conditions. The most masonry buildings receive moderate damage during moderate earthquakes with the intensity of 8 MSK, but the most important masonry buildings without rewinding will receive high damages in such earthquakes. The results of steel structures differ due to the structural system, so that steel buildings with braces have the minimum damage ratio and the steel buildings without braces will have the maximum vulnerability. Buildings without braces are probably destroyed in earthquakes with intensity of 9 MSK. Buildings without braces belong to moderate damage group in moderate earthquakes, but important buildings are considered in the high damage group. Buildings with braces, even in the worst conditions i.e. the major earthquakes, belong to the moderate damage group and are slightly damaged in medium earthquakes. Concrete buildings, which totally have a relatively better status, will receive moderate damage in the event of a major earthquake and very low damage in moderate earthquakes. Concrete buildings located in district 2 will receive moderate damage in the event of a major earthquake and very low damage in moderate earthquakes. Important buildings with reinforced concrete structure are placed in high damage group in high-intensity earthquakes and in moderate damage group in moderate earthquakes. So, we need to estimate vulnerability of these buildings and retrofit them immediately. The Immediate action can be taken with the aid of improvement guidelines [6, 7].

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ARTICLE

REVIEW THE EFFECT OF CASH FLOW VOLATILITY ON CASH HOLDINGS IN COMPANIES LISTED ON TEHRAN STOCK EXCHANGE

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ABSTRACT

In this study, the effect of cash flows and cash flows volatility on cash holdings and cash flow sensitivity has been studied. Thus, 127 companies listed on Tehran Stock Exchange were selected during 2011 to 2014. To test the hypothesis of this study, a multivariate regression model of panel and combined data has been used. This research shows that there is a positive and significant relationship between cash flow and cash holdings which indicates that companies with more cash flow hold more cash. Also, cash flow volatilityhas a negative impact on cash holdings, that is, companies with higher cash flow volatility hold lower cash. Finally, there was a direct and significant relationship between cash flow volatility and its sensitivity which indicates that companies with higher cash volatility have more sensitivity (are more sensitive). Overall findings showed that double – row planting pattern had better performance compare to single row. Double - row planting arrangement where on double - row raised bed with 95000 plants per hectare is the best choice for Faba Bean and forage production, because with changing arrangement from single row to double row the inter plant competition was decreased and we could get high yield.

INTRODUCTION

Cash flows were one of the most important financial statement items that are among the most efficient reports to reflect the performance of business unit in terms of cash and states the required information about creation and use of cash to the users of financial statements. Cash is of the important resources in any economic unit and balancing the available cash and cash needs is the most important factor of economic health in any business unit. Cash enters the business unit through normal operations and other sources of financing, and used for operation, interest payments, debt repayments and extending the business unit. Inflow and outflow of cash in each business unit is the reflection of management decisions about short-term and long-term operational programs and investment and financing projects. Information obtained from that constitute the foundation and basis of many decisions and judgements of major user groups of financial information of business units [1].

Two prevailing theories on discussion about cash holdings, are the theory of transactioncosts (tot) and hierarchicaltheory (pot). According to "tot", companies determine the desired level of cash holdingsbased on balancing the benefits and costs of cash holdings. Based on this theory, three incentives for holding cashcan be the trading, precautionary and speculative incentives [2].

According to the trading incentive, companies that encountered by reduced internal resources can provide it by selling assets, issuing new shares, loansor reducing the dividends. But all of these strategies entail costs that have both fixed and variablecosts elements. As a result, companies that faced high transactional costs for their payments hold a lot of cash assets [3].

Based on the precautionary incentive, companies hold the cash to reduce the likelihood of financial crisis in hard times and ultimately based on the speculative incentive, companies hold the cash assets in order to speculate and exploit the future unexpected investment opportunities when the external financing is costly [4].

On the other hand, the agency problems are one of the most important determinantsof cash holdings in companies. Research results have shown that in countries in which the rights of shareholders are not protected well, companies hold more cash compared to the countries in which the shareholders have good support. Also, conflict of interests between shareholders and management can be related to the cash holdings in companies. Based on the viewpoint of agency cost by Jensen and Meckling [5], managers have incentives for further investment and thus, most likely they hold some projects with negative current value to maximize their personal interests and show no desire to terminate them. Also, information asymmetry plays an important role in maintaining the liquidity. Harford and others believe when there is information asymmetry (ibid. 2010), the company is likely to maintain high liquidity to prevent the agency cost of external financing. But the important point is that the cash flow volatility has a major impact on the lack ofliquidity and sensitivity of cash-investment factor. Companies with high cash flow volatility, in the case of liquidity shortage, hold higher cash flow compared to companies with low cash flow volatility and the amount of investments by these companies is more sensitive compared to companies that are internally financed. The impact of cash flow volatility on the company's liquidity is also associated with status of financial constraints in the company. Companies that are financially limited, hold more cash in response to the increased the cash flows volatility. In contrast, companies that are not financially limited are not sensitive to the cash flows volatility (Bao et al, 2012).

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Since this issue is in a theoretical and empirical literature that seem conflicting, the aim of this paper is to develop the theoretical and empirical literature on the impact of cash flow volatility on sensitivity factor of cash flow. Therefore, the aim of this research is to evaluate the impact of cash flows volatility on the sensitivity of cash flows in the companies listed on Tehran Stock Exchange.

Theoretical essentials and experimental background of the research

There is no doubt that the cash holdings of a company must be determined proportionate to the cash flows obtained from operating activities. The cumulative amount of cash flows that is referred as the cash flows sensitivity, is influenced by other company features but in general, it can be expected that the amount of cash holding moves in one direction with the amount of operating cash flows. Cash flow is generally considered as an indicator of the financial health of the company [6]. Cash flows of each business unit provide information about the financial situation of the company for all shareholders so that they can assess the ability of company to make cash and cash equivalents in the future and the necessary conditions for application of these cash flows. Volatility measures the changes in the value of financial tool at specific time horizon and states the risk of that tool in the desired period. When there are volatilities in cash flow, the company is likely not only will need to use the capital markets and external resources to meet the liquidity problems but also due to the notoriety of volatilities, will increase the cost of this use. Therefore, cash flow volatility reflects the potential risk of future operations, investment and financial activities (Jing, 2005). Investment opportunities are also factors affecting the cash flow. According to the studies conducted by Duchin [2], there is an inverse relationship between precautionary demand and investment. Holding the cash for a precautionary incentive provides liquidity for companies to help the investors in dealing with unexpected opportunities in the future.

Almeida et al. [7] in a research as the cash flow sensitivity examined the relationship between operating cash flow and cash reserves. Their main purpose was to compare the measure of cash flow sensitivity with the sensitivity of investment cash flow. They extended the Opler liquidity model using theoretical and empirical analysis that, using the data of 29954 companies from 1971 to 2000 in the New York Stock Exchange market, they have demonstrated that the sensitivity of cash flows is a more appropriate measure for identifying the financial constraints.

Han and Qiu (2006) showed that companies with financial constraints increase their cash holdings in response to the increased the cash flows volatility, because financial constraint created a kind of competition and conflict between current and future investments, despite the risk of future cash flows makes incentives for precautionary savings.

Faulkender et al. [8] in research as transaction costs and adjustments of financial leverage found that the adjustments of financial leverage have both fixed costs and variable transactions costs. Company's cash flow and its deviation from the target leverage will affect the decisions made on how to access the capital markets. When the fixed costs of accessing the foreign markets were covered, companies are quickly (but incomplete) adjust to the target financial leverage. Ultra-leveragedand under-leveraged companies have different advantages in moving towards their target leverage ratio. Finally, they showed that the adjustment decisions depend on market conditions and financial constraints of the company. Their results, in general, defend the relationship between balance costs and target leverage in decisions of company leverage.

Goldmanand Viswanath [9] in a study examined the relationship between cash flow volatility and dividend policy in exporter and non-exporter Indian companies. They used the logarithm of 5-year variance of cash flow to calculate the volatilities of cash flow. Their research results show that there is a significant relationship between cash flow volatility and dividend policy. In this study, severity of exports, age and size indicators have been used as the representatives of cash flow volatility.

Kangarluei et al. [10] analyzed the impact of operating cash flow on the adjustments of financial leverage in companies listed on Tehran Stock Exchange. The results show that the operating cash flow has a negative and significant impact on the adjustments of financial leverage and financial leverage; while it has a positive and significant effect on the speed of financial leverage adjustment. The negative relationship between leverage and liquidity suggests that companies with high liquidity assets prefer to finance the cash for their investment activities. Also, the research results show that the operating cash flow can help the companies in reaching the target leverage and optimal capital structure. Kamyabi et al. (2014) examined the relationship between cash flow volatility and cash flow sensitivity with dividend policy in Tehran Stock Exchange. The results of this study indicate that there is no significant relationship between cash flow volatility and dividend policy and also, research results showed no relationship between cash flow sensitivity and dividend policy.

Haghighat and Zargar Fiuji [11] explored the impact of financial constraints and hold cash on the sensitivity of investment to cash flow. Their statistical population were consisted of the companies listed on Tehran Stock Exchange during [12] to 2011. In this study, Whiteduv Kaplan-Zinglez and dividends ratiowere used as measures of financial constraints. The results of hypotheses testing show that there is a positive relationship between capitalexpenditures and cash flow and, companies without financial constraints compared to the companies with financial constraints have more investment sensitivity to cash flow. Also, other finding of this study indicate that the interaction of cash holdings with investment sensitivity to cash flow is negative and this association is stronger in companies with financial constraints.

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Valipour [13] examined the association of cash flow volatility to predict the stock return. Statistical population of the study was the companies listed on Tehran Stock Exchange, that according to the considered terms, 50 companies were selected during 2002 to 2008. The study results indicate that short-term volatilities of operating cash flows were the related data to predict the stock returns, while the long-term volatilities of operating cash flows have no significant relationship on stock return. Pouyanfar et al. [14] explored the relationship between accounting and economic measures of valuable performance of companies in the cement and petrochemical industries of Tehran Stock Exchange. The results indicated the superiority of economic measures in comparison with accounting standards and inadequacy of accounting measures in evaluating the performance of companies.

MATERIALS AND METHODS

Research hypothesis

According to the theoretical essentials and research background, this study aims to examine the effect of cash flows volatility on the sensitivity coefficient of cash flow-cash in listed companies, so the main hypotheses of the research are explained as below.

First hypothesis; there is a significant relationship between the company's cash flow and cash holdings in the companies listed on Tehran Stock Exchange.

Second hypothesis; cash flows volatility has a significant impact on cash holdings in companies listed on Tehran Stock Exchange.

Third hypothesis; of cash flows volatility has a significant impact on cash flow sensitivity in companies listed on Tehran Stock Exchange.

Method

The research data were collected from financial statements of companies listed on the Tehran Stock Exchange, exchange data banks and "Rahavard Novin" software. The collected data was prepared using Excel software and then the final analyze was conducted by "Eviews" and "Stata" softwares. The research time span of the research was a 10-year period based on the financial statements of the companies from 2011 to 2014.

The research sample includes those companies listed on Tehran Stock Exchange which have the following features:

Companies whose fiscal year end in March.

The acceptance date of companies in Tehran Stock Exchange are prior to the fiscal year 2009.

Companies which have no changed fiscal year between "2011" to "2014".

Due to the different nature, they are not a part of financial, investment institutions and banks.

They have fully presented the financial information required for conducting this research during the studied time period.

According to the conducted surveys, 127 companies during 2011 to "2014" were qualified for the above terms and selected for the statistical sample.

Research variables

Operational definition of research variables is as follows:

The independent variable of this research was the volatility of cash flow and, cash holdings and cash flows sensitivity were considered as the dependent variable. In the following, each one and how to measure them will be discussed.

Independent Variable

To measure the long-term cash flow volatility, a six-year period was considered. To measure the long-term volatility the variance of operating cash flow is used and to neutralize the effect of difference in the company sizes and Iran, the operating cash flows of each period were divided by the assets of each company in the same period [9].

Dependent Variable

Dependent variable of the research is the level of cash holdings. To calculate the dependent variable of cash balances, the total cash and cash equivalents, including short-term investments, relative to the total assets ratio was used.

Another dependent variable of this research is the cash flow sensitivity. To measure the cash flows of a company, following the Martin and Pereira in 2006, an indicator of cash flows sensitivity called annual changes in total cash is used.

Control Variables of the research

Financial leverage: obtained through dividing the debts by assets.
Company size: natural logarithm of assets
Research model
To test the research hypotheses the following models are used respectively:
Cash = $\beta 0 + \beta 1$ cfo + $\beta 2$LEV+ $\beta 3$SIZE+€
Cash = $\beta 0 + \beta 1$ cfovol + $\beta 2$LEV+ $\beta 3$SIZE+€
Changes in cash= $\beta 0 + \beta 1$ cfovol + $\beta 2$LEV+ $\beta 3$SIZE+€

Results

Descriptive statistics

The results of the descriptive analysis of the data are presented in [Table 1]. As can be seen, the mean, standard deviation and the number of observations of research variables are presented in the table below. According to the obtained values, it can be said that the second column shows the number of available variables, which the number of all variables over 5 years is equal to 635. The third and fourth columns show the mean and standard deviation of each variable, respectively. For example, the mean for the financial leverage variable is equal to 58 percent which shows that most of the data are concentrated around this point. Or in other words, the amount of the debts of the studied companies to their assets is equal to 58% on average. In general, the dispersion parameters are the measures for determining the amount of dispersion from each other or the dispersion relative to the average. Of the most important dispersion parameters is the standard deviation. The value of this parameter for the variable "cfvol" is (0.04447) and for the variable "size" is equal to (1/57), which shows that among the research variables, these two variables have the highest and lowest dispersion, respectively.

Table1: Descriptive Statistics of research variables

Standard deviation	Mean	Number of observations	Variable
-0790	-0668	635	cash
-1454	-1463	635	cfo
-1802	-5849	635	lev
1.57	13.93	635	size
-0447	-0319	635	cfvol

Inferential statistics

Durability test of variables

If in a regression analysis the data are not durable, while the determination coefficient is great the statistics values of "t" coefficients may be high which may cause false inferences about the relationship between variables. In this case, a false or dummy regression has been created. To avoid this situation, the desired data must be made static. For investigating the presence of a unit root in the panel patterns, we can use tests like Lyon, Lin and Chu and Harris.

One way to make the variables durable is differentiation, but due to the data loss in this method, we examine the disturbing elements of the implemented model in terms of being durable. As we can see, the disturbing elements are durable, there will no need to the durability of each variable anymore and we acknowledge that the model is also durable as a co-integration. So we have:

Table 2: Durability test of residuals of research mathematical models

Variable	Model	Probability level
Model error elements (residuals)	First	0.000
Model error elements (residuals)	Second	0.000
Model error elements (residuals)	Third	0.000

As already explained, this model is durable as co-integration. Considering that the probability level of the test is lower than 5%, it indicates the durability of disturbing elements of implemented models.

Table 3: Results of F Limer Test (Chow) and Hausman Test

Research Hypotheses	F Limer Test (chow)		Hausman Test	
	F	p-value	F	p-value
First Model	3.78	0.000	9.66	-021
Second Model	4.52	0.000	103.7	0.025
Third Model	-792	0.9423	Non-panel data	

According to [Table 3] the significance level (p-value) of F-Limer test is less than 5% for the first and second models and represents the confirmed panel data. Also, the significance level for Hausman test is less than 5% for the first to second models that represents the constant effects of intercept. The significance level of F Limer test for the third model is more than 5% and panel data were not approved and there is no need to run the Hausman test.

Table 4: Results of variance dissimilarity

Research Hypotheses	Significance level and test statistic	
	F	p-value
First Model	8.05	0.000
Second Model	7.05	0.000
Third Model	31.057	0.000

The results in [Table 4] show that the significance level of this test is less than 5% which represents variance dissimilarity in residuals. It should be noted that this problem has been met in final estimation of models.

Table 5: Results of series auto-correlation test

Research Hypotheses	Significance level and test statistic	
	F	p-value
First Model	27.71	0.000
Second Model	29.36	0.000
Third Model	38.74	0.000

As can be seen in [Table 5], the significance level of this test for all models is less than 5% and represents a series auto-correlation between the residuals that has been resolved in the final estimation of models.

Table 6: Estimation of first model of research

Cash = $\beta_0 + \beta_1$ cfo + β_2LEV+ β_3SIZE+€				Mathematical model
81%	Determination coefficient		635	Number of panel observation
74%	Adjusted determination coefficient		127	Sections number
-000	Significance level of whole model (F)		5	Periods number
Significance level	"t" statistic	Standard error	coefficients	variables
-000	6.014	-0091	-0553	cfo
-000	-6.75	-0099	-.0669	Lev
-046	-2.00	-0022	-.044	Size
-000	5.17	-0310	-1606	C
0.2119			Jarque-bera (residuals)	
2.3			Durbin-Watson	

DISCUSSION
Analysis and test of research hypotheses

The significance level of F statistic is equal to 0.000 which is less than 5%. Therefore, one can say with 95% confidence that the above mathematical model is significant and acceptable generally. The independent variable (cash flows) has a positive coefficient which is significant at the 5% level. Therefore, one can say with 95% confidence that there is a direct and significant relationship between cash flows and cash holdings. Therefore, the first hypothesis is accepted. Financial leverage and firm size variables have also negative coefficients that at 5% level and 95% confidence have a significant relationship with the dependent variable. Also, the significance level of jarque-bera is more than 5% and represents the normal distribution of residuals. Also, the value of Durbin-Watson is equal to 2.3 and between the ranges of 1.5 to 2.5 which indicates the lack of auto-correlation in the final estimation model.

Table 7: Estimation of second model of research

Cash = β₀+ β₁ cfovol + β₂LEV+ β₃SIZE+€			Mathematical Model
83%	Determination coefficient	635	Observations number
78%	Adjusted determination coefficient	127	Sections number
0.000	Significance level of "t" statistic	5	Period numbers
Significance level	"t" statistic	Standard Erro	coefficients	Variables
.000	-9.47	.0844	-.8379	cfovol
.000	-10.51	.0066	-.0694	Lev
.000	-9.44	.0270	-.0146	Size
000.	12.47	.061	.3377	C
0.1034	Jarque-bera (residuals)			
3.2	Durbin-Watson			

The significance level of F statistic is 0.000 which is less than 5%. Therefore, one can say with 95% confidence that the above statistical model is significant and acceptable generally. The dependent variable (cash flow volatility) has a negative coefficient which is significant at the 5% level. Therefore, one can say with 95% confidence that there is an inverse and significant relationship between cash flow volatility and cash holdings. Thus, the second hypothesis is also accepted. Financial leverage and firm size variables have also negative coefficients that at 5% level and with 95% confidence has a significant relationship with the dependent variable. Also, the significance level of jarque-bera is more than 5% and represents the normal distribution of residuals. Also, the value of Durbin-Watson is equal to 2.3 and between the ranges of 1.5 to 2.5 which indicates the lack of auto-correlation in the final estimation model.

Table 8: Estimation of third model of research

Changes in cash= β₀+ β₁ cfovol + β₂LEV+ β₃SIZE+€			Mathematical model
13%	Determination coefficient	635	Observations number
12%	Adjusted determination coefficient	127	Sections number
0.000	Significance level of parent statistic	5	Period numbers
Significance level	"t" statistic	Standard Error	coefficients	Variables
000.	13.82	.0199	.2761	cfovol
.3428	-.9492	.0085	-.0081	Lev
.3093	1.017	.0006	.0006	Size
.5479	-.6012	.0088	-.0056	C
.0654	Jarque-bera (residuals)			
2.09	Durbin-Watson			

The significance level of F statistic is 0.000 which is less than 5%. Therefore, one can say with 95% confidence the above statistical model is significant and acceptable generally. The independent variable (cash flow volatility) has a positive coefficient which is significant at the 5% level. Therefore, one can say with 95% confidence that there is a direct and significant relationship between cash flow volatility and cash flows sensitivity. Thus, the third hypothesis is also accepted. Financial leverage and firm size variables have also negative coefficients that at 5% level and with 95% confidence have a significant relationship with the independent variable. Also, the significance level of jarque-bera is more than 5% and represents the normal distribution of residuals. Also, the value of Durbin-Watson is equal to 2.09 and between the ranges of 1.5 to 2.5 which indicates the lack of auto-correlation in the final estimation mode.

CONCLUSION

Conclusion and recommendations

This research shows that there is a positive and significant relationship between the cash flow and cash holdings which indicates that companies that have more cash flow hold more cash. Findings of the research, is consistent with findings of Han and Qui (2007) and Almeida et al. (2004). Also, cash flow volatility has a negative effect on cash holdings, that is, companies that have a higher cash flow volatility hold lower cash. This is consistent with the findings of Opler (1999), Ozcan Ozkan (2004) and Ferreira et al, (2004). The results show that cash flows and cash flow volatility have a significant effect on cash holdings. These findings may show us that corporate managers in order to adopt the appropriate policies to the cash held in the firm, note a factor other than cash flow and cash flow volatility. On the other hand, the actual and potential investors and other stakeholders can consider this factor when deciding about the amount of cash held by the companies. And also it seems that Iranian companies greatly tend to hold cash

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for their investments and precautionary needs. For this, the government needs to create a durable and sustainable economy to encourage the companies to further investments and reducing the cash holdings. Future researches can investigate the subject of present research in separate industries in Stock Exchange and in more time periods, and use other models and formulas to measure the volatility and sensitivity of cash flows.

CONFLICT OF INTEREST
There is no conflict of interest

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ARTICLE

THE IMPACT RATIO OF PRINT MEDIA IN TOURISM DEVELOPMENT AND MARKETING (CASE STUDY: HAMEDAN PROVINCE)

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ABSTRACT

BIn spite of Iran's capabilities in the field of tourism, unfortunately it could not achieve competent position in this industry yet. Among the factors that can develop and improve the country's tourism industry is to implement effective informing tools and parameters through media and marketing. This study intends to describe the thinking of exploitation of print media and marketing tool as the philosophical foundation of tourism development. In this study, three kinds of questionnaire with 230 questions were designed that were distributed among new agencies, travel agencies, and travelers. In order to collect data from the region under study, we performed a field operation (questionnaire), and to analyze the data SPSS software has been used, and to confirm or reject research hypotheses, Chi-square statistical test (X^2) has been applied as well. Regarding the field surveys (questionnaire) distributed among tourists in 2015, we require to plan basically and rapidly to develop and improve tourism in the region under study. Basically planning with accurate and correct goals can provide high incomes from valuables monuments of this city. Based on the research results, it was proved that publishing reports and topics about tourism in print media can be one of the driving factors for trip. There is also a relationship between professional publications of the tourism area and tourism development, and there is a significant relationship between tourism special occasion letters and brochures, promotional maps and tourist attraction.

INTRODUCTION

In the tourism section of the horizon of 2025 outlook document, Iran will be changed to the world's one of the important poles of tourism, and to realize it, the number of tourists entering Iran should reach about 20 million people. Getting36 billion dollars foreign exchange and realization of about four million job creations are among the important plans of Iran's tourism industry in the horizon of 2025 outlook document. Attracting six million and 700 thousand foreign tourists to the country till 2020, and attracting 20 million foreign tourists have also been predicted in the 2025 outlook. According to the compiled plan, 10 percent of foreign tourist attraction of country, equal to 670 thousand people, till the end of 2020 is the share of Hamedan provoince, and in the outlook document the share of Hamedan to attract foreign tourist is 15 percent (Unit of Research and Statistics of Cultural Heritage, Handicrafts, and Tourism of Hamedan). The realization of this statistics indicates that a path full of prowling is drawn for Hamedan province in respect of tourist attraction, and in this regard advertisements and introducing tourism capacities needs compiled planning.

Problem Statement

Introducing tourism potentialities and capacities principally and accurately in print media has basic role in tourist attraction, and this principle has been confirmed following numerous studies in the present era. However, these media not only in global arena but in national and regional arenas could not be planned for making people familiarized with cultural, tourism, and historical attractions. In spite of Iran's capabilities in tourism area, according to the existing statistics, unfortunately it could not achieve competent position in tourism industry yet. Among the factors that can develop Iran's tourism is to implement tools such as media, effective parameters of informing and advertisements and hence to perform marketing through press. This study intends to describe the impact ratio of print media on tourism development and marketing, and bring about the important studies about the role of print media in the tourism development.

In fact, what is the relationship between print publications and the development of tourism of Hamedan Province? What is the role of print media in tourism development and marketing for tourist attraction as a sign and symbol of social, economic, and cultural developments?

Research Questions

➢ Can publication of reports and topics about tourism in print media be one of the driving factors for trip?
➢ Is there any relationship between professional publications of tourism area and tourism development?
➢ Can print media be appropriate capacity for marketing and advertising in tourism area?

Importance and necessity of research

Tourism industry is among important industries with rapid growth in the world's economic development that by creating the highest ratio of added value can directly and indirectly impact on other economic and cultural activities. Hamedan province in recent decades could make income through various ways such as

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agriculture, industry, and manufacturing by providing and creating specific possibilities and resources, but according to the studies of experts and existing documents in recent decadein public organizations such as Hamedan Governor, the major pivot of province tourism development has been drawn. Probably, many developed countries and even developing countries have increased their national income through tourism; hence this principle would be realized for Hamedan province, if a compiled plan is acted in respect of introducing tourism capacities.

Research hypothesis

➢ It seems that publishing reports and topics about tourism in print media is one of the driving factors for trip.
➢ It seems that there is a relationship between professional publications of tourism area and tourism development.
➢ It seems that there is a significant relationship between tourism special occasion letters and brochures, promotional maps for marketing and tourist attraction.

Research goals

➢ Compiling appropriate strategy for province tourism development based on marketing and media advertisements,
➢ Offering appropriate solutions in order to develop tourism by planning for media advertisements,
➢ Studying the role and the impacting ratio of print media in tourism development and marketing of Hamedan province.

Concepts and key words

Tourism

Since tourism produces product and services and is related to workforce, capital, and added values, it can be regarded as industry. The services offered in this industry in some cases such as the ratio of tourists' satisfaction and their experiences are intangible, and thus cannot be compared with other industries. [1]

Development

Michael Todaro, the famous western sociologist: "Development should be known as multidimensional flow that requires basic changes in social structure, public attitude and national institutions and also accelerating economic growth, reducing inequality, and eradicating absolute poverty of the people. [2]

Marketing

One of the components of tourism development framework is marketing. With regard to the existing competition among tourism destinations, the issue of marketing has high importance. [3]

Advertisements

Advertisements and informing are regarded as very important topics in the economics. Nowadays informing and advertisements is performed by different methods in the world to attract tourists, and it has had the highest impact on tourist attraction. Being updated in informing has been among the effective cases in tourism development.[4]

Media

Actually the information related to the events and social problems has created horizontal relationship among people, and mass media such as press by reflecting the news has made them aware of the issues of each other. This application is particularly useful to the extent that in decision makings, corresponding with life programs for people or audiences can be interpreted as social lifeblood.[5]

Research history

Y. Kim (1988) in his dissertation tries to evaluate tourism from the spatial structure dimension and its impacts on tourism trips model. This dissertation by using "Pull Model" offers spatial heterogeneities of tourism trips and the evaluation and process obtained from it.

J. Lee (1992) in his dissertation has investigated and analyzed the approaches of various tourism groups to evaluate economic impacts of tourism andleisure times on various tours. This research has been formed by using various viewpoints of visitors of tourism regions.

Sh. Zahede (2004) in this article by giving importance to the nature and tourism considering it tries to deal with the relationship and impacts that these two have on each other. The result of this article indicates that mankind damages the natural environment with the speed more than what nature can tolerate.

Mankind's behavior often ignores sustainability principles, and at the end he recommends some programs and solutions.

Dinari (2006) in an article entitled as religion and tourism has investigated the tourism position in Islam religion and concluded that one of the most important motivations of tourism in the world is religious and pilgrimage trips, particularly if that geographical region has beautiful and natural perspectives, so it can have more impacts for attracting tourists.

Mahdizadeh (2007) in bases and solutions of tourism development in Iran has investigated the tourism industry and has offered solutions such as the development of activities of municipalities and other organizations, and has concluded that all issues related to Iran's tourism would be removed by the cooperation of related organizations.

Pelag described the relationship between growth and decline of tourism destinations with regard to the tourists' features in 1973, and declared that tourism destinations move along with a range related to various market segments in various development stages (Maktabi, 2005: 20).

Mass media such as press has created horizontal relationship among people, and mass media such as press by reflecting the news has made them aware of the issues of each other. This application is particularly useful to the extent that in decision makings corresponding with life programs for people or audiences can be interpreted as social lifeblood. Therefore, press as a sensitive and delicate cultural tool deals with people's thoughts and mentality (Atarzadeh, 1999: 36). Generally, the mass media, and particularly press are like double-edged blade that can take steps for stabilization and can harm as well; can promise development, and can spread the seed of anti-development ideology in the community atmosphere (Walker, 1991: 15).

Nuclear deal, an opportunity for planned advertisements in tourism

Iran's tourism market due to the sanctionshad become stagnant for several years, and it was revived after agreement, and this event should be an opportunity for Hamedanprovince too. Simultaneous with the great historical deal plan of Iran and 5+1 countries, a new wave of expressing interest of American and European countries for travelling to Iran has been emerged, and this wave is tangible under consideration of media. Professional tourism media of Hamedan should try to put Hamedan in the path of foreign tourists' trip by making relationship with foreign media.[6]

CNN:"Iran will change your imaginations"; the number of Iran's tourists is increasing, and the authorities of this country predict that the number of tourists reaches 20 million people till 2025.

Euro news: "Regions to travel in 2016"; one of the signs of events occurring in Iran is the opening of Akor Chain Hotels in Tehran International Airport. Rotana Chain Hotels has also planned to open 4 hotels in Iran in 2018 [7].

National geographic: "Blooming of desert flowers"; some years before, the future of tourism in this country seemed dark, but by the removal of sanctions, it seems that the desert flower blooms.

Journal of trip and leisure times: "Returning to global arena"(According to Table1) ;With the recent agreement of Iran with the United Nations Security Council and the 5 + 1 group, one of the greatest civilizations of world is returning to the global tourism arena[8]

Table 1: A Look at Approach Change of Foreign Media for Introducing Iran

No.	Date of Release	Newspaper Name	Country	Released Report/ News
1	August 2014	La Repubblica	Italy	In this newspaper travelling to Kish has been raised and Iran's Kish has been assimilated to Iran's Hawaii
2	October 2014	Daily Telegraph	England	Advertising a 12 days tour to Iran with 3150 pounds; in this report for the first time in England, travelling to Iran has been mentioned, and performing the tour in 2016has been predicted.
3	November 2013	Le Figaro	France	The introduction of Iranian gardens in the cities of Shiraz, Tehran, Isfahan and botanical garden of Mashhad by two French journalists in Iran; the prediction of this newspaper is that from March 2013 to March 2014 Iran will host 4 million and 500 thousand tourists.
4	May 2014	Los Angeles Times	America	(Iran is the best country for foreign tourists) Janet Morse Tourism Agency and Horizon in this report have declared that they sell two times tourists to Iran in 2016 compared with 2014.
5	January 2012	Financial Times	London	The newspaper is one of the oldest newspapers of political economy newspapers and it is printed concurrently in dozens of important world cities including London, Frankfurt, Milan, Madrid, Los Angeles, San Francisco, Washington, Hong Kong, and etc. This newspaper predicted that in 2014 Iran is the first option in the list of tourism destinations.

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6	December 2013	The Times newspaper	London	It recommended English tourists totravel to Iran in 2016.

Hamedan Press

- Although press grow in Hamedan later than the cities of Tehran, Rasht, and Tabriz, the interest and enthusiasm among Hamadani Libertarians and Constitutionalists has caused this city to be regarded among the pioneers of this cultural movement.
- Simultaneous with the signing of The Constitution by Mozaffareddin Shah, the work of preparing newspaper and journal was formed and developed in Hamedan. The first newspaper in Hamedan was AdlMozafar Newspaper held by Alikhan Zahirodolle (the Governor of Hamedan) in 1324 AH (corresponding with 1906 AD). In one statistics from 1324 to 1329 AH (1906 to 1911 AD), in The Constitution Covenant by expansion and intensification of press, 2.7 percent of publications were published in the West of country, namely Hamedan, Kermanshah and Borojerd. But exact information shows that the number of publications of Hamedan is higher than mentioned score. In this date, 8 journals including the AdlMozafar Newspaper as the first journal of Hamedan, were published in Hamedan that in summary they can be introduced as such[9]
- Currently in addition to 44 print weakly and journals, two newspapers of HamedanPayam and Hegmataneh are printed regularly.
  - The only newspaper of Hamedan Payam in the west of country with a special page on tourism in respect of introducing and informing in this area has published 1260 pages of tourism and 35 special issues with cultural, tourism, and handicrafts content concurrent with offering an informing website since 2011.
  - Although currently news websites and informing bases of Hamedan province do not have special page on tourism, they are activating in a sensitive competition in respect of covering news and offering reports in this area (According to Table 2).

Table 2: Print media Hamedan Province

Newspaper	Weakly	Fortnightly	Monthly
Hegmataneh Hamedan Payam	Mehrab Future Image Morning of Hope Voice of Alvand Voice of Malayer Hamedan in 1400 Your Call Sepehr of West Parsi Media Hi Hamedan Culture of Malayer Dawn of Hope Hamedan, Blooming Season	Voice of Alvand Publication of Bouzar Thought Green Culture Sun of West Hadith of Mehr With the People of Hamedan Prospect of Hamedan Hope of Vine Children's Song Moshkan Heaven Scent Hamedan Citizen Sarang	Purification

Data collection method

The required data for performing this research has been investigated and collected by the two following forms:

a) Document and Library Information: that has been collected by referring to the books, articles, sites, archives of related institutions and the press.

b)Field Method: that the required information has been collected by using questionnaire tool with regard to the basic goals and questions of research. In some cases interview has been used as well.

Data collection tool

This research contains three series of questionnaires. The questionnaire related to media including explanatory and multiple choices questions. The questions of travel agencies and travelers are all multiple choices. Having performed field researches and data collection, the obtained data was evaluated by SPSS software.

Data analysis method

In this research, the reliability of questionnaires was assessed by Cronbach's alpha and SPSS software, and the validity of questionnaire of this research was assessed through confirmation of experts, in a way that the questionnaire validity has been confirmed by the supervisor. In order to prove the hypotheses Chi-Square 2 test has been used. In this research, since it has been designed for three groups of community related to tourism, the obtained data for each questionnaire has been used to confirm each hypothesis. Then, by implementing SWOT technique, marketing strategy determinationand data analysis has been performed by this method.

MATERIALS AND METHODS

The method of this research is descriptive-analytical in respect of the nature, subject, and the goals predicted for it, and it is among the applied researches. Since the questionnaire and interview tools have been used for collecting required data in this research, hence from another angle it can be regarded as a survey (field) research.

Statistical Population

The statistical population in this research includes all managers of travel agency offices, the number of whom is 40, and all managing director of print media of Hamedan province the number of whom is 30, and all tours entering 5 travel agency offices that are 160 people chosen during 1 monthselectively.

Data related to media questionnaire

In order to confirm the hypothesis "It seems that there is a significant relationship between tourism special occasion letters and brochures, promotional maps for tourist attraction" the data extracted from this questionnaire was used,whether in print or multiple choice. In this group of questionnaire, both explanatory questions and multiple choice questions were used. The answers of explanatory questions will be investigated and evaluated in the next chapter. The sample explanatory questions are:
Describe the professional tourism journals published in Hamedan.

How can the choice of tourism destinations influence through print media?

How do you describe the mission of journals towards the accurate introduction of attractions in order to attract tourist?

State your opinion about the presence of experts in the field of tourism for the preparation and arrangement of tourism specialized publications.

State your opinion about the presence of experts in the field of tourism marketing and advertising in the preparation and arrangement of tourism specialized publications (According to Table 3).

Table 3: Frequency of the Options of Each Question

Questions	Very Good	Good	Medium	Weak	Very Weak
1	3	4	5	9	8
2	4	5	7	6	6
3	3	8	7	7	4
4	3	3	5	10	7
5	3	3	8	10	5
6	3	5	6	11	4
7	4	4	12	5	4

Investigating the Data of Multiple Choice Questions by Chi-Square 2 Test

In this section we have two hypotheses:
H0: The relationship between two nominal variables is not significant.
H1: The relationship between two nominal variables is significant.
According to the output table of software, (Table 3.1) the significant value in Chi-square2 test is as follows:

Table 3.1: Symmetric Measures Chi-Square Tests

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.809a	24	.046
Likelihood Ratio	37.006	24	.044
Linear-by-Linear Association	1.979	1	.160
N of Valid Cases	96		
a. 28 cells (80.0%) have expected count less than 5. The minimum expected count is.27.			

The P-value for Chi-square 2 is equal to 0.046; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.

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P-VALUE = 0,046 ≤ α= 0.05 → acc H1

Now, that the relationship is significant, we evaluate the Cramer's V value. The closer its value is to zero, the relationship between two nominal variables is lower; and the closer it is to one, the relationship is more. (According to Table 3.2):

Table 3.2: Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.619	.046
	Cramer's V	.310	.046
N of Valid Cases		96	

TheCramer's V value is 0.310; it means that its value is closer to zero; hence the relationship between two variables in this hypothesis is relatively low (fig.1).
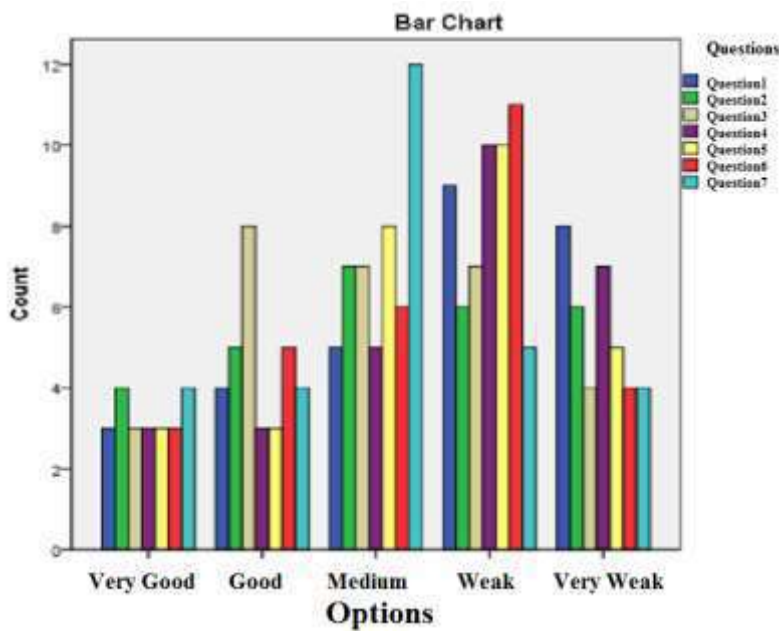

Fig. 1: Bar Chart of the Frequency of Options in Each Question (Source: Author)

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The Data Related to the Questionnaire of Providers ofService to the Travelers (Travel Agencies)

In this section, considering the questions asked from people offering services and the obtained data, we intend to confirm the hypothesis "It seems that there is a relationship between professional publications of tourism area and tourism development" by using Chi-square 2 test (According to Table 3.3) (fig.1).

Table 3.3: Frequency of Options in Each Question

Questions	Very Good	Good	Medium	Weak	Very Weak
1	4	10	10	9	6
2	5	11	12	8	4
3	4	13	13	5	4
4	4	5	16	8	7
5	5	12	12	7	4
6	4	6	18	8	4
7	4	9	10	9	6
8	5	9	15	5	5
9	5	14	8	8	4
10	4	9	12	11	4
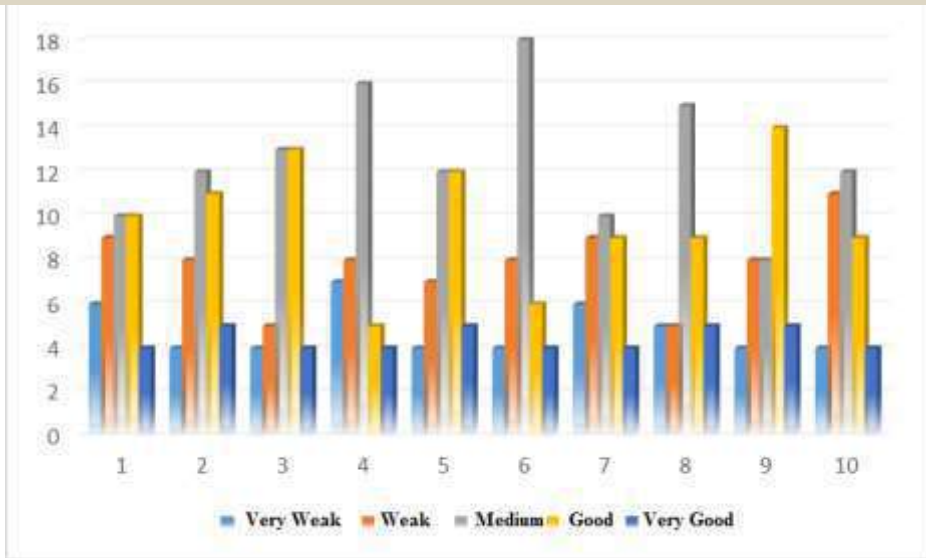
Fig. 2: Frequency of Options in Each Question

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Table 3.4: Questionnaire Reliability Case Processing Summary

		N	%
Cases	Valid	5	100.0
	Excludeda	0	.0
	Total	5	100.0
a. Listwise deletion based on all variables in the procedure.			

According to the result obtained from the output of SPSS software, the Cronbach's alpha value is 0.954, and since the range of Cronbach's alpha change is from 0 to 1, the Cronbach's alpha value of this research is 0.954, and due to proximityto the score 1, it has very appropriate reliability (According to Table 3.5).

Table 3.5: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.954	.965	10

Investigating Questions by Chi-Square 2 test

In this section we have two hypotheses (According to Table 3.6):
H0: The relationship between two nominal variables is not significant.
H1: The relationship between two nominal variables is significant.

Table 3.6: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	59.582a	36	.008
Likelihood Ratio	66.622	36	.001
Linear-by-Linear Association	.321	1	.571
N of Valid Cases	205		
a. 29 cells (58.0%) have expected count less than 5. The minimum expected count is.70.			

(According to Table 3.7), the significant value in Chi-square 2 test is as follows:

The P-value for Chi-square 2 is equal to 0.008; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.
P-VALUE = 0,008 ≤ α= 0.05 → acc H_1

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✓ Now, that the relationship is significant, we evaluate the Cramer's V value. The closer its value is to zero, the relationship between two nominal variables is lower, and the closer it is to one, the relationship is more.(According to Table 3.7):

Table 3.7: Symmetric Measures

Symmetric Measures		Value	Approx. Sig.
Nominal by Nominal	Phi	.539	.008
	Cramer's V	.270	.008
N of Valid Cases		205	

The Cramer's V value is 0.270, meaning that its value is closer to zero. Thus, the relationship between two variables in this hypothesis is relatively low.

## Data Related to the Questionnaire of Travelers

In this section, it should be mentioned that in the demographic information part, a series of questionnaires did not have information; hence the people's statistics do not correspond with the number of questionnaires (According to Table 3.8) (Fig. 3).

Respondents' Demographic Information

❖ **Respondents'Gender**

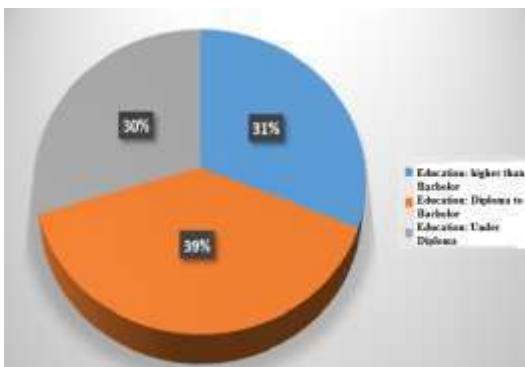**Table 3.8:** Frequency of Respondents'Gender

Gender	
Female	Male
67	69
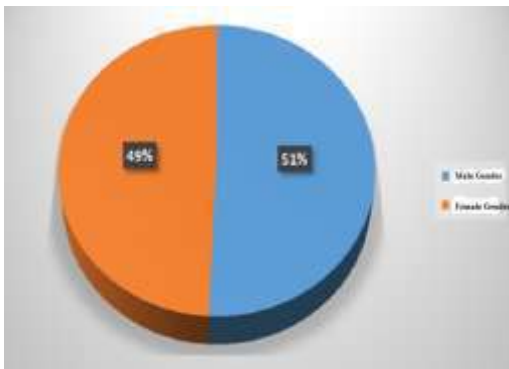
Fig. 3: Respondents' Gender

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❖ **Respondents' Education** (According to Table 3.9) (Fig. 4).

Table 3.9: Frequency of Respondents'Education

Education		
Under Diploma	Diploma to Bachelor	Higher than Bachelor
40	52	42

Fig. 4: Respondents' Education

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❖   **Respondents' Original City** (According to Table 3.10) (Fig 5).
❖

Table 3.10: Frequency of the Origin of Destination Cities

Original Cities	Ilam	Zanjan	Khuzestan	Gilan	Isfahan	Kermanshah	Bojnoord	Kerman	Kurdistan	Cities of Hamedan province	Shiraz	Ahvaz	Tehran
Frequency	9	9	9	10	9	9	9	9	9	9	9	6	14
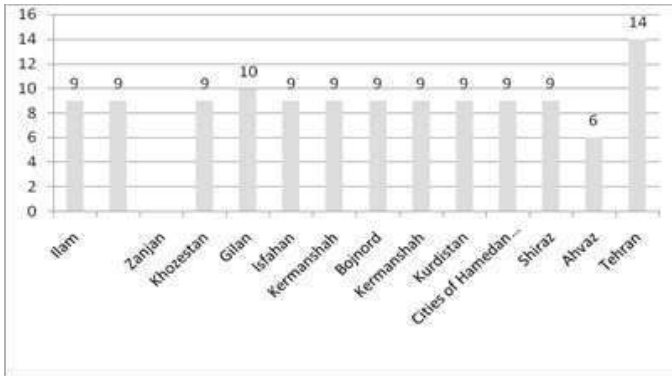
Fig.5: Frequency of Travelers Entering the City of Hamedan, Responding the Questionnaire
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Data related to the questionnaires

In this section considering the questionnaire data, it will be tried to investigate the hypothesis: "It seems that publishing reports and topics about tourism in print media is one of the driving factors for trip" by Chi-square 2 test (According to Table 3. 11).

Table 3.11 : Frequency of the Options in Each Question

Questions	Very Good	Good	Medium	Weak	Very Weak
1	28	32	35	36	29
2	28	31	37	36	28
3	32	33	36	31	28
4	31	36	31	33	29
5	29	36	34	33	28
6	28	32	37	33	30
7	29	33	34	36	28
8	29	32	34	35	30
9	29	37	33	32	29
10	28	32	32	33	35
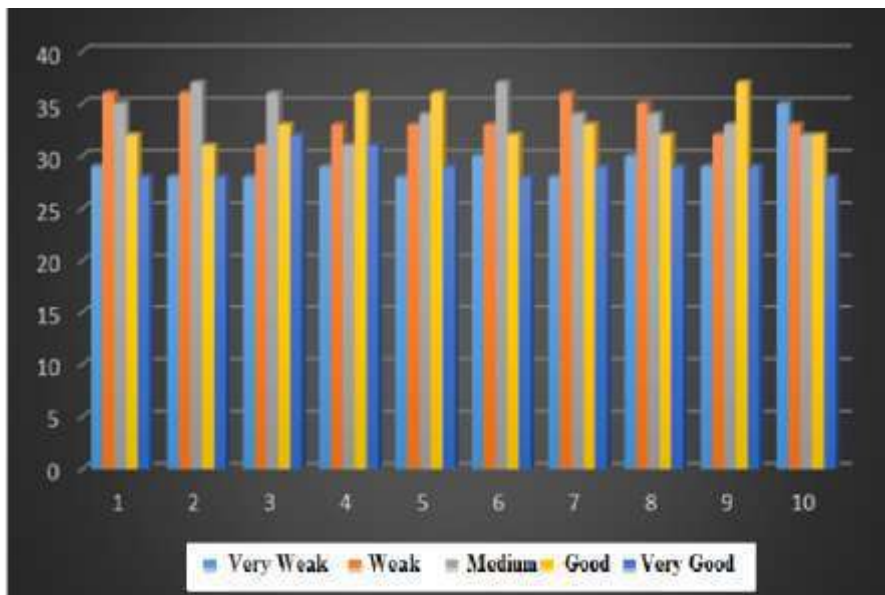
❖ **Questionnaire Reliability:**

Table 3.12: Frequency of the Options in Each Question

Case Processing Summary		N	%
Cases	Valid	5	100.0
	Excludeda	0	.0
	Total	5	100.0
a. Listwise deletion based on all variables in the procedure.			

According to the result obtained from the output of SPSS software(Table 3.12), the Cronbach's alpha value is 0.929., and since the range of Cronbach's alpha change is from 0 to 1, the Cronbach's alpha value of this research is 0.929, and due to proximity to the score 1, it has very appropriate reliability (Table3. 13).

Table 3.13: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.929	.924	10

❖ **Investigating Questions by Chi-Square 2 Test**

In this section we have two hypotheses:
H0: The relationship between two nominal variables is not significant.
H1: The relationship between two nominal variables is significant.
According to the output table of software, the significant value in Chi-square 2 test is as follows (Table 3.14):

Table 3.14: Investigating Questions

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	58.064a	36	.011
Likelihood Ratio	57.594	36	.013
Linear-by-Linear Association	.292	1	.589
N of Valid Cases	204		
a. 20 cells (40.0%) have expected count less than 5. The minimum expected count is 1.37.			

The P-value for Chi-square 2 is equal to 0.011; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.
P-VALUE = 0,011 ≤ α= 0.05 → acc H1
Now, that the relationship is significant, we evaluate the Cramer's V value. The closer its value is to zero, the relationship between two nominal variables is lower, and the closer it is to one, the relationship is more (According to Table 3.15):

Table 3.15: Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.534	.011
	Cramer's V	.267	.011
N of Valid Cases		204	

The Cramer's V value is 0.267; it means that its value is closer to zero; hence the relationship between two variables in this hypothesis is relatively low.

Hypotheses test
The present research is based on the following three hypotheses:

- It seems that publishing reports and topics about tourism in print media is one of the driving factors for trip.
- It seems that there is a relationship between professional publications of tourism area and tourism development.
- It seems that there is a significant relationship between tourism special occasion letters and brochures, promotional maps for marketing and tourist attraction.
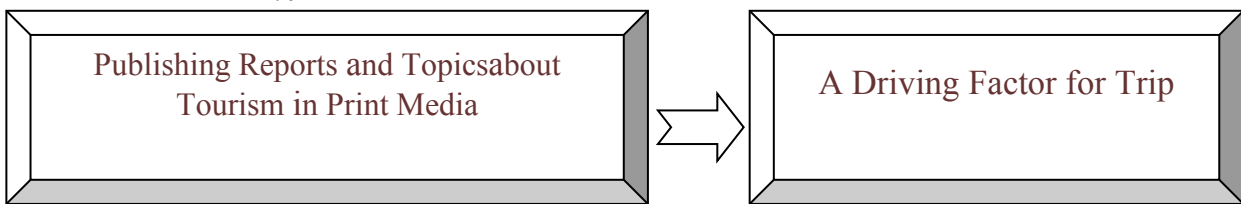
First hypothesis:

- It seems that publishing reports and topics about tourism in print media is one of the driving factors for trip.
- H0: Publishing reports and subjects about tourism in print media is not one of the driving factors for trip.
- H1: Publishing reports and subjects about tourism in print media is one of the driving factors for trip.

Table 4: Table of questions of the questionnaire of publications asked to confirm or reject first hypothesis.

Questions	Very Good	Good	Medium	Weak	Very Weak
1	10%	12%	17%	30%	31%
2	15%	18%	25%	21%	21%
3	10%	28%	24%	24%	14%
4	10%	10%	20%	35%	25%
5	10%	10%	28%	34%	18%
6	10%	18%	20%	38%	14%
7	14%	14%	40%	18%	14%

According to output table of software the test value is equal to 0.046; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.
Thus, with regard to the above points, the first hypothesis is confirmed (Table 4).

First hypothesis

Publishing Reports and Topicsabout Tourism in Print Media	⇨	A Driving Factor for Trip

According to output table of software the test value is equal to 0.046; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.
Thus, with regard to the above points, the first hypothesis is confirmed(According to Table 4.1).

Table 4.1: First hypothesis

Independent Variable	Dependent Variable	Chi-Square 2	Significance Level
Publishing reports and topics about tourism in print media	A driving factor for trip	0.046m	**0.000

The First Hypothesis is Accepted
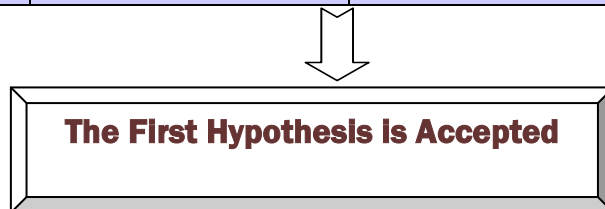
Second Hypothesis

It seems that there is a relationship between professional publications of tourism area and tourism development and marketing.
In this section we have two variables of professional publications of tourism area and tourism development:
H0: There is not a relationship between professional publications of tourism area and tourism development.
H1: There is a relationship between professional publications of tourism area and tourism development.

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Table 4.2 : Questions of the Questionnaire of Publications Asked to Confirm or Reject Second Hypothesis

Questions	Very Good	Good	Medium	Weak	Very Weak
1	12%	25%	25%	23%	15%
2	14%	20%	32%	22%	12%
3	10%	33%	33%	14%	10%
4	10%	12%	40%	20%	18%
5	12%	30%	30%	18%	10%
6	10%	15%	45%	20%	10%
7	10%	24%	27%	24%	15%
8	12%	22%	42%	12%	12%
9	15%	35%	20%	20%	10%
10	12%	24%	32%	20%	12%

According to output table of software(Table 4.2), the P-value for Chi-square 2 is equal to 0.008; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.

Thus, with regard to the above points, the second hypothesis is confirmed.

Second hypothesis

Professional Publications of Tourism Area ⟹ Tourism Development and Marketing
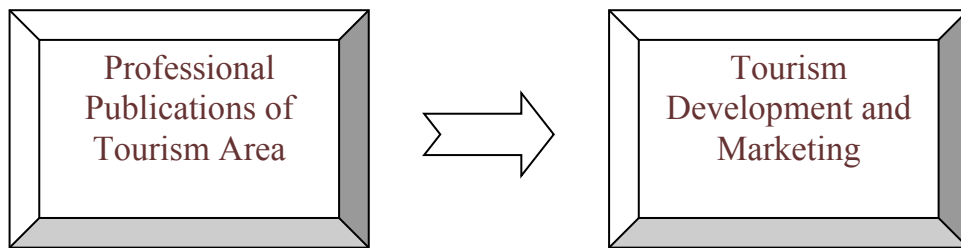
According to output table of software, the P-value for Chi-square 2 is equal to 0.008; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.

Thus, with regard to the above points, the second hypothesis is confirmed(According to Table 4.3).

Table 4.3 : Second hypothesis

Independent Variable	Dependent Variable	Chi-Square 2	Significance Level
Professional publications of tourism area	Tourism development and marketing	0.008	**0.000

Third Hypothesis

It seems that there is a significant relationship between tourism special occasion letters and brochures, promotional maps for marketing and tourist attraction.

In this section we have two variables of tourism special occasion letters and brochures, promotional maps and marketing and tourist attraction.

H0: there is not a relationship between tourism special occasion letters and brochures, promotional maps and marketing and tourist attraction.

H1: there is a relationship between tourism special occasion letters and brochures, promotional maps and marketing and tourist attraction.

Table 4.4 : Table of questions of the questionnaire asked to confirm or reject third hypothesis.

Questions	Very Good	Good	Medium	Weak	Very Weak
1	17%	21%	22%	22%	18%
2	20%	20%	15%	25%	20%
3	20%	21%	23%	19%	17%
4	19%	23%	19%	21%	18%
5	18%	23%	21%	21%	17%
6	17%	20%	23%	21%	19%
7	18%	21%	21%	22%	18%
8	18%	20%	21%	22%	19%
9	18%	23%	21%	20%	18%
10	18%	20%	20%	20%	22%

According to output table of software (Table 4.4), the P-value for Chi-square 2 is equal to 0.011; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.

Thus, with regard to the above points, the third hypothesis is confirmed.

Third hypothesis

| Tourism special occasion letters and brochures | ⟹ | Tourist attraction |
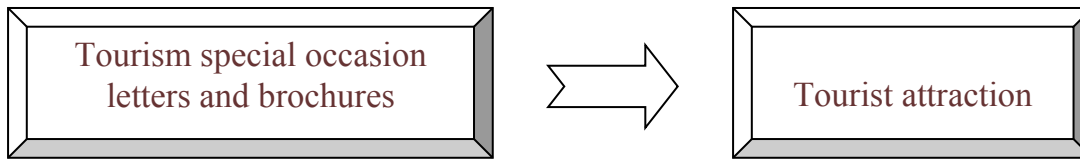
According to output table of software(Table 4.5), the P-value for Chi-square 2 is equal to 0.011; hence H1 is accepted with 5 percent error level. In other word, the relationship between two nominal variables is significant.

Thus, with regard to the above points, the third hypothesis is confirmed.

Table 4.5: Third hypothesis

Independent Variable	Dependent Variable	Chi-Square 2	Significance Level
Tourism special occasion letters and brochures	Tourism attraction	0.011	**0.000

The Third Hypothesis is accepted
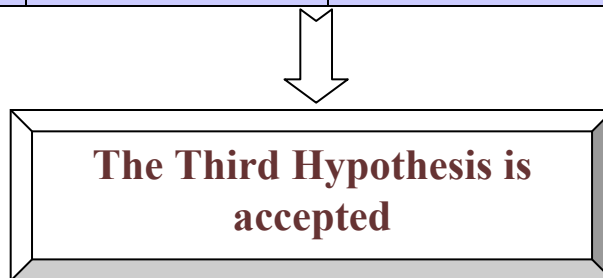
RESULTS

Hamedan province has high capabilities in respect of tourism activities, in a way that it is one of the unique regions in the country in respect of cultural and natural attractions.

But, unfortunately no accurate planning, as it should be, proportionate with tourism principles has been performed in it, and we witness many shortages and problems in all tourism regions in respect of infrastructure and superstructure services and facilities, and tourists' entering to them is only based on their varied attractions; and the mass media and advertisements whether at provincial level or at country level had the least consideration to it. This province lacks considerable and distinguished professional publications in tourism area, and the existing publications are not responsive to the province's requirement either. It seems that such an issue causes a great gap in this important and pivotal area in the province. Lack of infrastructures and superior thinking in the management area, and corresponding with global indicators in the tourism domain is a common factor that has exhausted the media activists in this sector.

In order to develop and improve tourism in the region under study we have an urgent and basic need for planning. Basicplanning with correct and accurate goals can provide high income from valuable monuments of this city.

CONCLUSION

➢ Vacancy of publishing professional publications exclusively in the tourism area in the province is tangible; this publication with a range of national and international distribution is the need of province.

➢ Utilizing experts and professionals in the tourism area for introducing attractions in the print media should be taken seriously.

➢ Using advertisements and marketing to find the appropriate position of publicationsof province in national and international arena should be planned.

➢ Preparing brochures to be compiled sustainably according to the international standards.

➢ Using creativity in respect of attracting tourists by activating informing tourism websites should be taken seriously.

➢ Hamedan is unknown in virtual world, by publishing print media pages in informing websites, we should institutionalize the culture of using press.

➢ Forming the committee of advertisement and informing for investigating the publication of peer reviewed reports and an advertisement should be taken seriously.

➢ To register images of tourism regions of Hamedan, the skillful news photographers along with journalists and stylish authors should be called to the province.

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CONFLICT OF INTEREST
There is no conflict of interest.

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None

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None.

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ARTICLE

INTRODUCING THE PROMISING MINERAL AREAS OF THE NORTHWEST OF QAZVIN PROVINCE BASED ON GEOCHEMICAL STUDIES

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ABSTRACT

The study area is located in the northeast of Qazvin Sheet 1: 100,000 and the south of Javaherdeh Sheet 1: 100.00 in the Hir area. The aim of this study was to conduct geochemical studies on Hir Region using heavy mineral and stream sediments. In regional and even semi-detailed geochemical explorations, regarding the relatively vast area under exploration, secondary geochemical halos were investigated. The present study aimed at finding anomalies and possible mineralization in Baijan and the surrounding areas. For this purpose, all data of the region were investigated. Then, using these maps and satellite imagery of the digital elevation model (DEM), the stream network map, heavy minerals, and stream sediment sampling points were prepared. After sampling and sending the samples to the laboratory, analysis was done on raw data. Then, the final map of geochemical exploration and anomalous areas were plotted.

INTRODUCTION

The Hir sheet of 1: 25.000 in the northwest of Qazvin province is located between geographical lengths of 50 degrees and 30 minutes as well as latitudes of 36 degrees and 45 minutes and 36 degrees and 30 minutes in the area of Hir village [Fig. 1]. Hir is a village in the western Alamut, Rudbar of Qazvin province in Iran with a coal mine[1]. Due to the geographical position of Qazvin province on the southern slopes of Alborz Mountains and abundant mineral traces of this province, geological and explorative activities have a long history in this province [2].

LITERTURE

Conducted regional explorations are limited to the northwest corner of Qazvin province. Unlike regional explorations, thematic explorations are significant, particularly in the field of alunite, kaolin, copper, lead and zinc. Regional explorations in the province of Qazvin are of geochemical type performed by geographical maps with a scale of 1: 100,000. The northern section units (Alborz) and the southern part of the province (Central Iran) are not appreciably different and rock sequences with late Precambrian platform deposits (Soltanieh Formation) are seen everywhere which continue more or less with several large and small sedimentary units to the Middle Triassic[3]. Upper Triassic-Middle Jurassic rows of a unit are limited to two orogeny events of early Cimmerian (Upper Triassic) and Middle Cimmerian (Middle Jurassic) which are mainly composed of shale and sandstone (Shemshak Formation) and are the coal-bearing sediments of Iran which have been accumulated on early Cimmerian forelands. All over Qazvin Province, Upper Cretaceous-Middle Jurassic rocks are [composed of] carbonate marl rows with small outcrops in the north and south of the province (Avaj). Cenozoic rocks begin with Eocene clastic igneous collections (Karaj formations) where granitic intrusions related to the Pyrenean orogeny are sometimes injected into them [Fig. 2]. Most parts of Cenozoic rocks of Qazvin province are the rows simultaneous with Cenozoic orogeny which have mainly been accumulated in the basins between mountains and have limited outcrops at the foot of heights [4][5].

Geological study of the area

The study area is a part of the complex tectonic system on the southern part of Central Alborz. Geological structures include fractures and folds that mainly have a northwest - southeast trend and follow the main trend of Alborz folding. These fractures are mainly of compressional faults. In addition to these fractures, other fractures were also observed in the area which follow the northeast - southwest trend.

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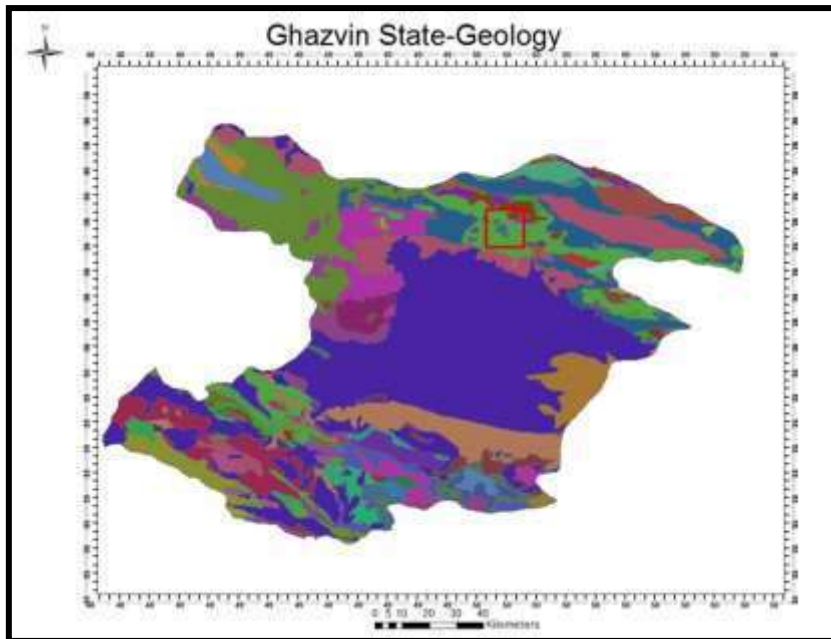
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Fig. 1: Road maps of the area under study

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Fig. 2: Geological map of Qazvin Province

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MATERIALS AND METHODS

Digital elevation model (DEM): In order to provide a sampling network of stream sediments, stream network and catchment area were provided. There are different ways to map the stream network of a region including the provision of river maps, review of topographic maps and aerial photos. One of the best and most important tools to study and design the sampling network of stream sediments is to use DEM satellite imagery in order to map the stream network and catchment of an area [6]. After defining the direction of flows in pixels of digital elevation images using Flow Accumulation tool, flow accumulation (i.e. the direction toward which each pixel flows) is identified [Fig. 3]. Having acquired the flow direction in the study area with use of various hydrology tools in GIS software, the drainage basin and stream network maps of the intended area are obtained[7].
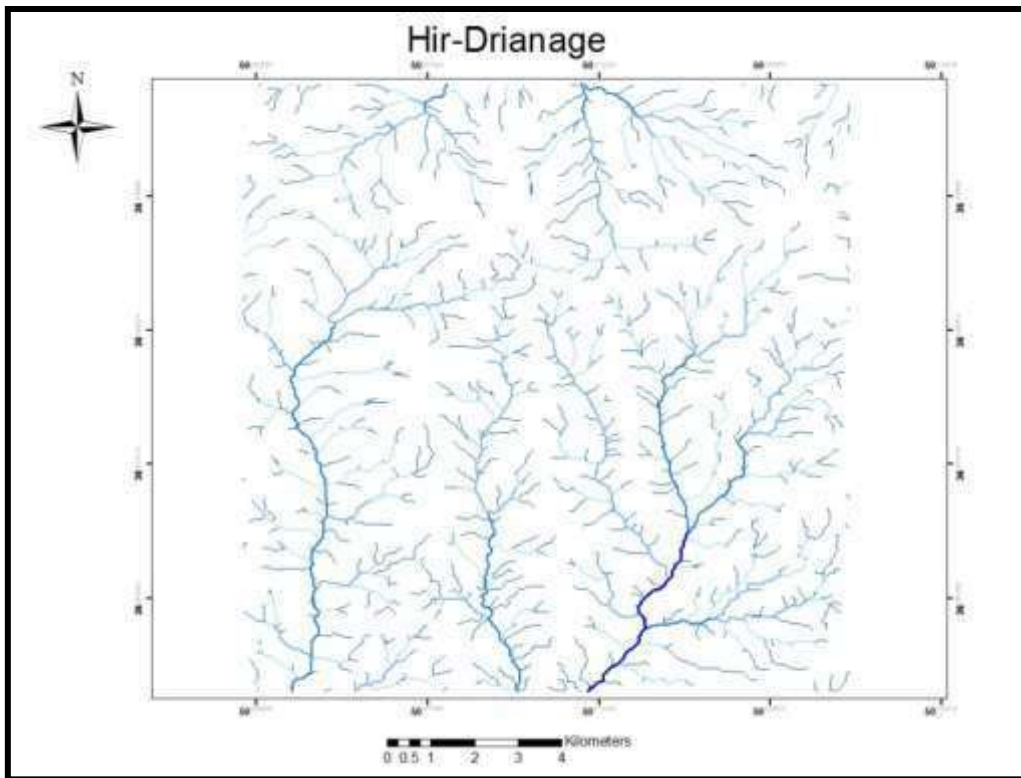
Fig. 3: Drainage using DEM

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Heavy mineral sampling

Heavy mineral sampling density is mainly a function of the area which should be assessed using this method. The greater is the basin area under study, the more is the number of samples needed for precise evaluation. Respective lithology could also be effective in heavy mineral sampling density. In this division, it is assumed that one or two samples are enough for each basin with an area of one or a few kilometers. Heavy mineral sample weight changes depending on the intended target. Usually, some amounts of heavy mineral samples of the river sediment are taken to obtain about 4 liters of -20 to +80 mesh after sieving and they are sieved in place. Samples are balled out in place and the sample size is measured before and after ball out. Then, pan washing is carried out on the samples. The remaining part was divided with standard intensities into three parts of strong and weak magnetic components as well as the non-magnetic part and the volume of each was measured. The non-magnetic part is then sent to be exposed to bromoform for separating the heavy and non-heavy parts [8]. Following the above steps, each component is studied and its percentage in the component is determined. Finally, using this percentage and the initial sample size in each stage, the amount of each of the heavy minerals is determined in ppm. It is obvious that the resulting numbers do not represent ppm in their stream environment because the samples are already sieved and their coarse components are removed. Of course, we can say that the values in their environment should certainly be less than the obtained values [Fig. 4]. It should be noted that the areas selected for heavy mineral sampling are introduced through the geochemical sample number in the same area. Each geochemical sample contained about 300 grams of stream sediments with a size of less than 80 mesh which were poured into a clean sack after sieving and numbered. After geochemical sampling, heavy mineral samples were also taken independently of the alluvia developed along the lithofacies. In heavy mineral sampling, it was attempted to design the sampling site on the separation border of heights with the low areas so as to achieve the highest concentration of heavy minerals due to sudden lowering of water velocity [9].
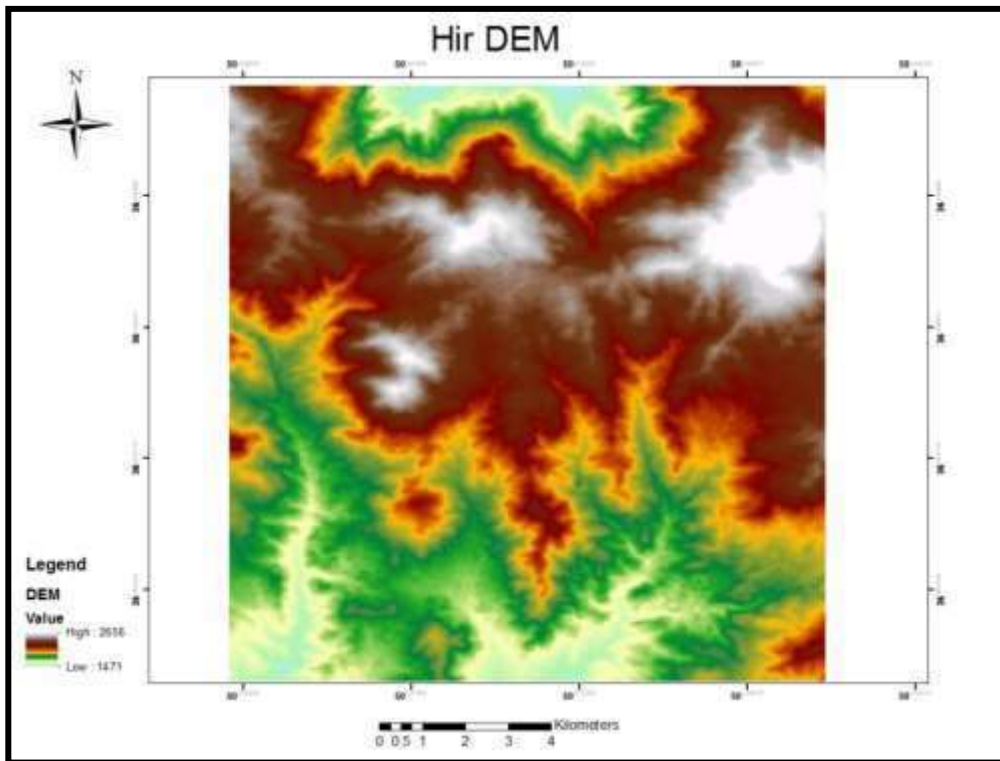
Fig. 4: Satellite imagery, digital elevation model of the study area DEM

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Analysis of geochemical samples

When sampling stream sediments mainly containing detrital components, sieving sediments and selecting components of suitable size is essential. This size is usually considered as 100 mesh based on experience in geochemical work carried out or being done in the country [10]. After transferring the samples to the laboratory, sample preparation steps such as drying, removing organic materials, powdering, and other tasks were done. After preserving half of the samples as control, the rest were sent for analysis of the elements to the Alborz Zarkavan Co. laboratory. After preparation, all samples were analyzed for [presence of] 44 elements. Measurement of all elements except gold was done using ICP-MS machine and FIRE ASSAY method was used for analysis of the gold element [11].
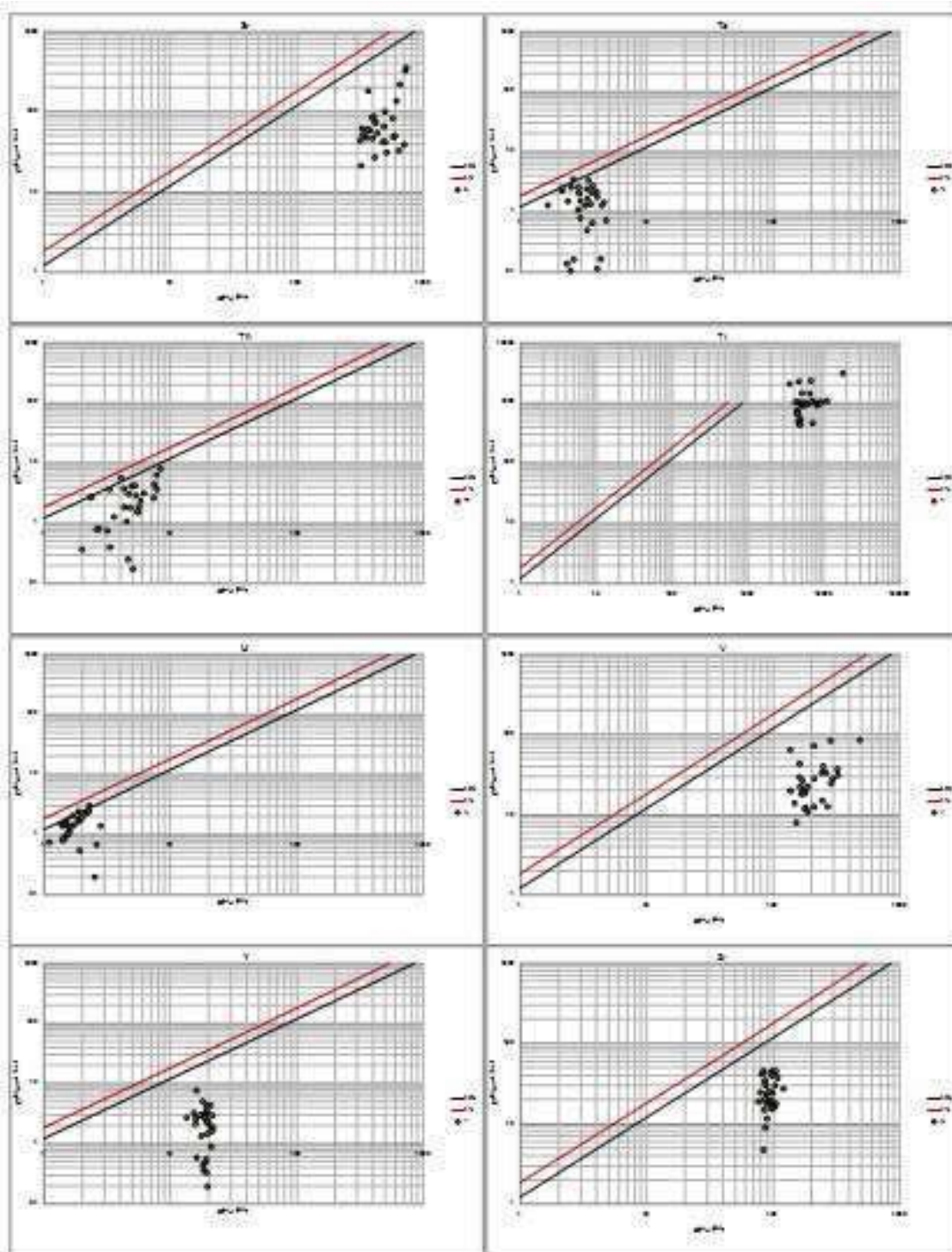
Fig. 5: Some elements of the graphical approach logarithmic graph Thompson – Havars

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Estimates of the censored data

Before analysis of geochemical data, censored data and errors have to be removed [Fig. 5]. Censored data are the ones among which some data can be found with quantities smaller than the device sensitivity limit due to the high sensitivity limit of measurement devices. Presence of such numbers among a series of data can disrupt statistical data [12].

Most important causes of such disorders include:

1. Statistical methods need a complete set of non-censored data;
2. In cases where relative measurements are carried out, such as separation of the anomaly from the field, the presence of censored data results in imprecise evaluations;

If censored data are estimated and replaced, the field value and anomaly intensity will be calculated more accurately.

There are different methods for estimating censored values which are used for data censored from top and bottom. In this project, a simple alternative method is used. Meanwhile, there is no data censored from top among the existing data. In this simple method, values less than the sensitivity limit at the lower bound are replacing by 3.4 of it. Generally, if the number of censored data vs. the whole data is negligible (around 15-10 percent), we can usually use this method [13].

Elements Ag, B, Cd, Hg, and Te have been removed from the process flows with 100% of censored data. In the case of Au element with 31% of censored data, process stages will be done with care. Regarding all elements of censored data, 3.4 of their sensitivity limit is used as the alternative value.
In cases where the data are mutually linked together, investigating their relationship with a bivariate statistical method yields appropriate answers. In this study, bivariate statistical methods of correlation coefficient and cluster analysis were used[14].

As stated in the analysis error section, the error values measured for a number of elements, particularly gold, has been more than 10%. Anomalies observed in interpretation of the data tree structure are most likely associated with the errors applied in the analysis of samples. According to the data tree structure, geochemical variables are divided into two groups.

According to the dendrogram, two main categories can be distinguished. The first category begins with Fe and ends with Au; it contains three sub-groups which collectively encompass all ore-forming elements.

The second category begins with As and ends with S; it has two sub-groups which collectively contain pathfinder elements of mineralization in the area.

Elements of Fe, V, Sc, and Cu are in the first subgroup of the first category indicating copper mineralization in the area along with enrichment of the iron group elements. This is observed frequently in the study area. In the second sub-group that is immediately below the first subgroup, there are Cr, Co, Ni, and other elements of the iron group which show the association of iron mineralization in the region with the main mineralization. Main mineralizers of the region, i.e. the elements Pb, Zn, Mn, and Au, are in the third subgroup which are in direct contact with the first and second sub-groups indicating their accompany with each other[15].

All mineralization pathfinder elements such as As, Sb, Tl, Bi, Be, W, Sn, Mo, Ba, and S are in the second category, some of which are related to the intrusive mineralizer mass in the region and are the associated elements of mineralization. With slight variations, such relations are visible in all statistical analyses for understanding the interrelationship between various elements. In this category, low and high temperature elements are respectively placed in the first subgroup (As, Sb, Tl) and the second subgroup (Bi, W, Sn, and Mo) and show a proper separation.

Factor analysis

One of the most complex and important issues in geochemical explorations is the simultaneous study of elements. One of the reliable methods in this field is factor analysis. This method has two huge advantages:

1. Reduction in data dimensions
2. Showing the relationship between various elements
With regard to the large number of elements and samples, the role of factor analysis is revealed more than ever which makes comprehension of data variability much easier[16].
Factor analysis is based on PCA method. This method is a technique for finding a linear combination of the primary variables forming new coordinate axes. These linear combinations are known as principal components and have the following properties:

1. A large part of variability can be justified by a limited number of new variables;
2. New variables, as a product of the linear combination of primary variables, are not correlated [Fig. 6].
   It is important to note two points before using PCA method:
•
 If the primary variables are not correlated (with a small correlation coefficient), there is no reason to use this method because it does not offer satisfactory results;
• Factor analysis is used only when there is a sufficient number of primary variables.

Factor analysis is performed in four steps:

1. Calculation of the correlation coefficients;
2. Extracting factors (i.e. determining the number and calculation method of factors)
3. Rotations and specific conversions of factors for better interpretation of the relationship between data;
4. Calculating the score of each factor for all samples.
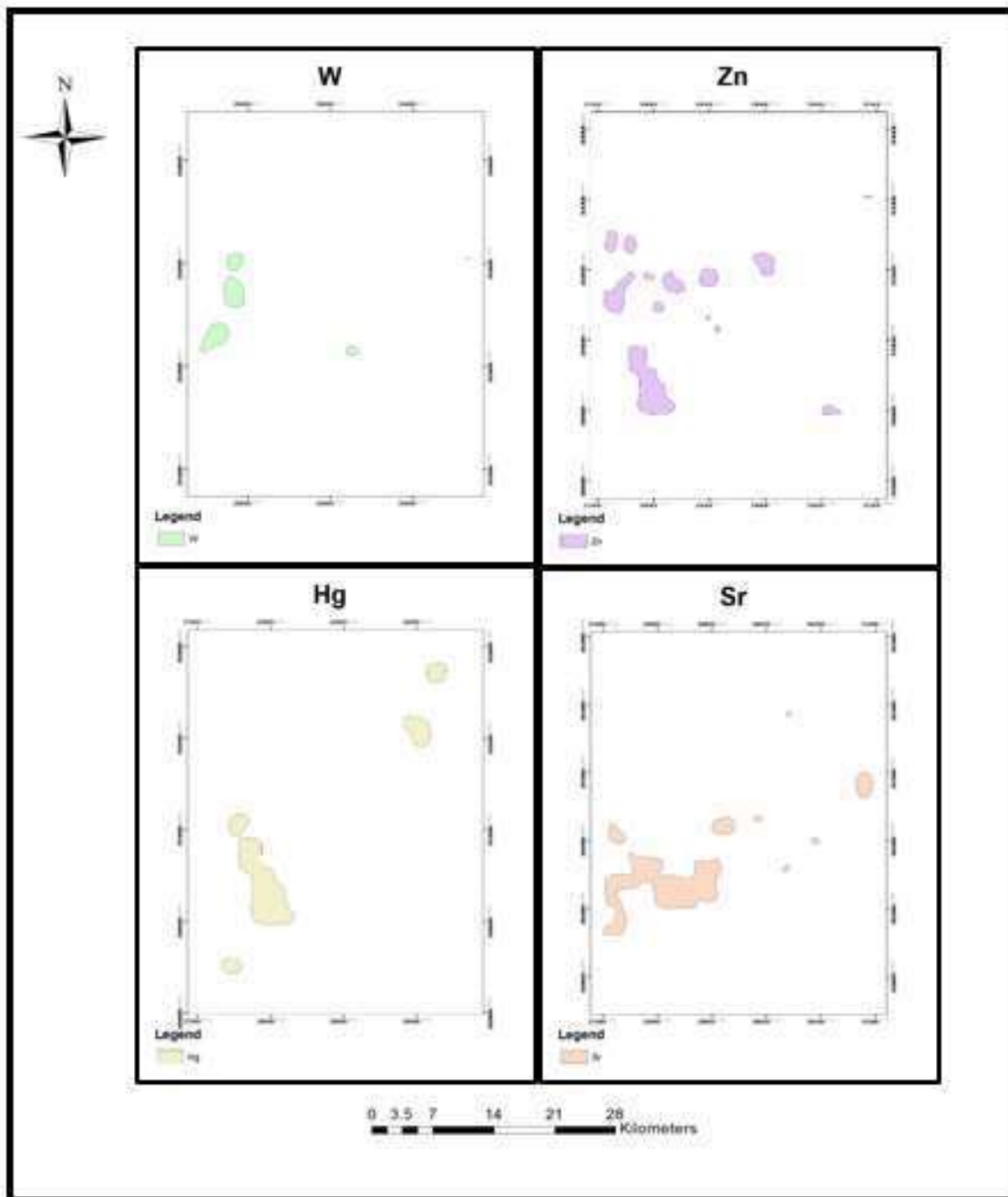
Fig. 6: Anomaly map elements univariate statistical method

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Drawings estimated maps

Final geochemistry map of Hir region was obtained using ArcMap software. In this map, areas of possible and suitable anomalies can be introduced as the areas having suitable potential. Here, we explore the promising areas [Fig. 7]. The final map of geochemical studies was obtained with regard to various samplings and statistical studies on geochemical data of the study area. After the investigation, four areas having anomaly and potential were introduced. Then, the areas introduced as having the potential are assessed [17].
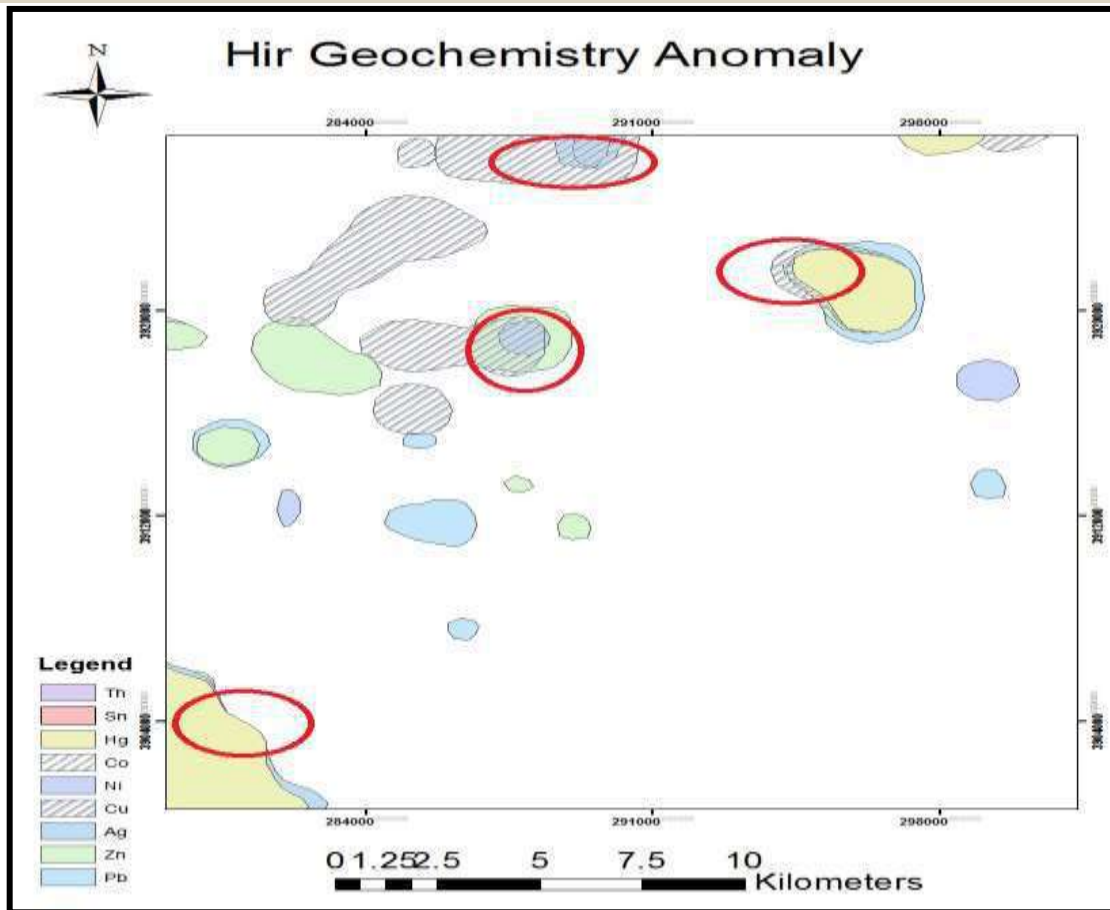
Fig. 7: Zone anomaly

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CONCLUSION

The results of geochemical explorations in the Hir sheet of 1: 25.000 resulted in identification of 4 areas having anomaly among which only one promising area was identified. This area is in the southwest of the study area and most of its anomalies are due to the elements zinc, copper, barium, cadmium, bismuth, iron, and manganese which can be used as pathfinder elements in exploring the resources.

For years, BLEG sampling has been used in mining countries of the world, especially in Australia and it can be very effective and useful in exploration of gold over large areas with low sample concentration. We can have a full confidence in the results of BLEG sampling in case of careful sampling and analysis of samples. Accordingly, planning to continue exploration activities of the following stages can be done without concern and high risks. Compliance of more than 90% of BLEG sample outputs with the results of geochemical samples within Hir region is a firm reason for high accuracy of the results of samplings carried out in this region.

3. The big advantage of BLEG vs. the traditional method is the possibility of identifying small amounts of gold at very long distances from the mineralization center due to which BLEG has become a very important and useful method in regional exploration projects.

4. Stream sediment samples were analyzed for 44 elements. Using ICP-MS device, the measurement method yielded reliable answers for all elements except gold; and FIRE ASSAY method was used for analysis of gold element.

5. After the review, elements of Ag, B, Cd, Hg, and Te were removed from the process flow with 100% of censored data. The processing will be done with care in the case of element Au with 31% of censored data. In the case of all elements with censored data, 3.4 of their sensitivity limit is used as the alternative value.

6. To determine accuracy of the laboratory, a total of 30 duplicate samples were selected and one of the best ways to determine the accuracy of measurements is using the graphical method of Thompson - Howarth in this project.

7. One, two, and multivariate statistical methods were used in this study, and it was observed that overlap

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among these methods increases the accuracy of assessments.

8. In examining the correlation coefficient, it was observed that the element Be has a good correlation with Pb, Sb, Sn, Ti, and W and the maximum correlation of Be in this group was 0.649 with the element W. According to the surveys conducted in the study area, major mineralization in the area is of hydrothermal vein-type and these elements are always present in such mineralization as trace elements and byproducts.

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ARTICLE

UTILIZING FUZZY EXPERT SYSTEM IN ORGANIZATIONS' PERFORMANCE ASSESSMENT

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ABSTRACT

This article provides a fuzzy expert system for evaluating organization performance. Organization evaluation is used for identifying and improving organization's competitive situation with the aim of alignment with market competitive atmosphere. Excellence models are self-assessment tools, one of which is EFQM. In this paper, expert performance evaluation is based upon EFQM. Application of fuzzy expert system in organizations' performance assessment causes a powerful control system for continuous assessment and enhancement of organizations' performance. This system evaluates all activities and metrics of organization and, based on this, points of strength and improvable points are proposed for performance enhancement.

INTRODUCTION

Every organization, regardless of its activities, size, structure, maturity, and its achievements in pursuing goals, needs to assess and evaluate its success in reaching business goals and guidelines. There exist several different models for performance assessment amongst which EFQM is more popular in Iran. EFQM was founded in 1998 in Europe and now it is an executive tool to help firms in measuring how much they are in organizational excellence balanced growth path. This tool helps organizations to compare their current and ideal situations and find the differences and, based on them and their reasons identify the solutions of optimizing the current situations and execute them.

The general goal of self-assessment is to find and analyze the strength points and improvable areas. For this aim, EFQM with cause-and-effect relationships between enablers and results is utilized. But the important point is that because of the qualitative nature of the assessment the selection of the framework is not enough to solve all the problems. Some of the problems are:

- The assessment results are variable regarding the views of persons to a degree, so the scores of different assessments would be different somehow.
- Due to the variety of criteria and sub-criteria of model and the complexity of relationships between them, it is difficult and inconvenient to invent the rules.

Thus, fuzzy expert systems are used in the form of EFQM model in order to resolve the above problems.

In designing the fuzzy expert system in EFQM excellence model, the goal is assessment based on the data given to the system about the situation of the organization. The results are scored criteria and listed strength points and improvable areas. The advantage of this method, besides facilitating the assessment process, is independence of the assessment results of the opinions of different persons, which could be a reliable and general option for assessing all organizations. Furthermore, based on fuzzy logic, the evaluators would be more convenient in determining the scores of approach, and results and the diversity of different evaluators' scores would be red uced.

A review on the literature of applying EFQM model in organizations reveals that it could be divided into two groups: the first group includes papers only executing and implementing EFQM model [1-11], the results of which was application and analysis of EFQM model and movement in the excellence path. Papers in the second group endeavor to combine E FQM model with other tools and models such as Data Envelopment Analysis [12], Intellectual Capital Management [13], DEMATEL technique [14], AHP technique [15,16], and System Dynamics [17-19] with the aim of improving the efficiency of EFQM model.

Moreover, with a review on the applications of Expert Systems a lot of utilization areas are found, such as car failure diagnosis [20, 21], compiler performance improvement [22], human disease diagnosis [23], detection of roller bearing defects [24], hybrid short-term load forecasting system execution [25], data quality fuzzy expert system [26], multi-sensor data fusion for land vehicle attitude estimation [27], analysis of the survey results in evaluation of university teachers [28], and modeling pipe deterioration using soil properties [29].

But, it seems that the application of expert systems in excellence models such as EFQM is unattended. Accordingly, in this research the application of fuzzy expert system for enhancement of organization

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SUPPLEMENT ISSUE

assessment using EFQM excellence model is studied. In this paper, first performance evaluation using fuzzy method is reviewed. Then, design of fuzzy expert system in EFQM excellence model is described and finally the results of applying this system are presented. Following are brief introductions to the key concepts used in the paper.

EFQM Excellence Model

EFQM model has 9 criteria. 5 criteria are enablers and the other 4 are results. Enablers cover what an organization does and results criteria refer to what an organization earns. Results are outcomes of executing enablers, and enablers are improved regarding feedbacks gained from results.

Enablers include leadership, policy and strategy, employees, partnerships and resources, and processes, and results consist of customer results, employees' results, people results, and key performance results. All the enabler criteria, except policy and strategy, involve 5 sub-criteria. Policy and strategy criterion includes 4 sub-criteria. Each results criterion is constituted of 2 sub-criteria. Accordingly, 28 sub-criteria are defined for enablers and 8 for results.

Expert System

Expert systems are systems used for processing and providing results or presenting knowledge. Expert systems are the most significant part of artificial intelligence. Generally, expert systems help in solving problems by using inductive knowledge and methods. The most important section in studying expert systems is knowledge engineering. In knowledge engineering the process of extraction and acquisition of knowledge from an expert person for considering it from a knowledge-based point of view is attended. Expert systems have different applications in diverse scientific areas nowadays and there is a bright vision of their more utilization in the future.

Fuzzy Logic

Fuzzy logic is a type of multi-value logics and is based upon fuzzy sets theory. Fuzzy sets are generated by generalization and expansion of sets in a natural way. In the real world, human recognizes a lot of concepts in a vague and imprecise way and uses them as. are a sort of variables accepting words and phrases of human or machine language as their values instead of numbers. As numerical variables are used in the mathematics calculations, in fuzzy logic are involved are expressed regarding the lingual values in set of phrases.

FUZZY PERFORMANCE ASSESSMENT

Regarding the fact that in the normal method each sub-criterion is given a score between 0 and 100 percent (with 5 percent step width) and the range is wide (20 different possible scores), the response of all assessors about a particular sub-criterion would not possibly be the same. Thus, the range 0 to 100 could be divided into smaller ranges. This would provide smaller number of options (5 selectable fuzzy choices) for assessors, which would lead to less confusion during the scoring process, more similar responses, and so more realistic scores.

In the proposed method, the scores are assumed to be triangular fuzzy numbers and assessors would choose amongst the following choices in scoring each sub-criterion:

1- 0% (very low): no evidence or reason (a small part of the areas)
2- 25% (low): limited evidences (almost one fourth of the areas)
3- 50% (normal): visible evidences (almost half the of areas)
4- 75% (much): precise and many evidences (almost three fourth of the areas)
5- 100% (very much): complete and wide evidences (almost all of the areas)
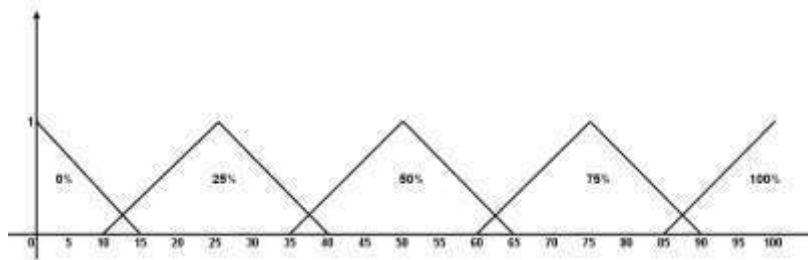
Figure 1. Triangular Fuzzy Numbers of 5 Choices

Table 1. Triangular Fuzzy Numbers

Choice	Qualitative Number	Triangular Fuzzy Number(m و α و β)
1	(very little) no evidence or reason	(0,0,15)
2	(little) limited evidences	(25,15,15)
3	(normal) visible evidences	(50,15,15)
4	(much) precise and many evidences	(75,15,15)
5	(very much) complete and wide evidences	(100,15,0)

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Finally for computing organization's total score, using fuzzy logic concepts and the formula of transferring fuzzy numbers to crisp numbers ('s formula: $\chi = m + \frac{\alpha - \beta}{4}$), the organization's total score which has been calculated in the fuzzy format is transformed into number.

In enablers' scoring tables, the score of each feature of approach, elements is assigned as a fuzzy number. Then using summation of two fuzzy numbers and scalar multiplication the direction of average, sub-criteria scores, criteria scores, and total score are computed. Finally as stated before the fuzzy number are transformed into equal numbers. The same steps are taken for results scoring tables.

It is worthy to know that in this method the scoring accuracy deteriorates, but it should be noted that in reality decision making is qualitative, such that all assessors mention that their scores are not definite and is a range of scores. So, this method is more natural and rational than the current method and is closer to reality.

DESIGNING FUZZY EXPERT SYSTEM IN EFQM EXCELLENCE MODEL
In designing this system the strength points, improvable areas, and scores of each activity and indicator is derived by the system regarding the information provided to the system by the user and rules defined in the system.

Information Provided by the User
The data needed to be entered by the user and the information gathered by the system through questioning is divided into two chief groups of results and enablers.

Results
The user is required to enter data such as indicator title, values of indicators during 4 years, aims during 2 years, comparison with dominant organizations for 4 years, and reason (e.g. the reason of reaching or not reaching the goals, the reason of having good or bad trend). The questions asked by the system from the user are mentioned in table 4 below.

Table 2. Questions Related to Results Section

Question		Answer	Description
A- Whether the indicator trend would be increasing or decreasing?		Increasing ☐ Decreasing ☐	If the trend is increasing 1 is assigned, otherwise -1 is assigned
Are the indicator goals defined well?	B- Are the goals alligned with strategy?	Yes ☐ No ☐	If the answer is 'Yes' 1 is assigned, otherwise 0 is assigned
	C- Regarding the organization's situation is it possible to reach the identified goals? Are the values of goals defined rationally according the easiness of achieving them?	Yes ☐ No ☐	If the answer is 'Yes' 1 is assigned, otherwise 0 is assigned
D- Based upon the descriptions provided in cause section, are there cause and effect relationships between the indicator and the approach, the settlement, or the evaluation and revision?		Yes ☐ No ☐	If the answer is 'Yes' 1 is assigned, otherwise 0 is assigned
E- How many areas has been covered by the indicator?		almost all areas ☐ almost three forth of areas ☐ almost half of areas ☐ almost one forth of areas ☐ just a small part of areas ☐	for the choices all areas, three forth of areas, half of areas, one forth of areas, and small part of areas, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively

Enablers
The user is required to enter data such as activity title and number of indicator related to this activity (for searching indicator and reasons related to it).
Questions asked by the system are as declared in table 5 below.

Table 3. Questions Related to Enablers Section

Question	Answer	Descriptions
F- Which approach element affects information of the results feedback column?	approach ☐ settlement ☐ evaluation and revision ☐	for approach, settlement, and evaluation and revision, numbers 1, 2, and 3 are assigned respectively
G- Is the process defined and formulated well?	very little ☐ little ☐ medium ☐ much ☐ very much ☐	for the choices very much, much, medium, little, and very little, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively
H- Is focused on the stakeholders' requirements?	very little ☐ little ☐ medium ☐ much ☐ very much ☐	for the choices very much, much, medium, little, and very little, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively
I- Does support strategy and policy?	very little ☐ little ☐ medium ☐ much ☐ very much ☐	for the choices very much, much, medium, little, and very little, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively
J- Is related to other approaches?	very little ☐ little ☐ medium ☐ much ☐ very much ☐	for the choices very much, much, medium, little, and very little, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively
K- Is the approach implemented?	very little ☐ little ☐ medium ☐ much ☐ very much ☐	for the choices very much, much, medium, little, and very little, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively
L- How many areas has been covered by the indicator?	almost all areas ☐ almost three forth of areas ☐ almost half of areas ☐ almost one forth of areas ☐ just a small part of areas ☐	for the choices all areas, three forth of areas, half of areas, one forth of areas, and small part of areas, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively
M- Is the effectiveness and transmission of the approach measure regularly?	very little ☐ little ☐ medium ☐ much ☐ very much ☐	for the choices very much, much, medium, little, and very little, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively
N- Is the learning activities used for identifying and sharing the best activities and improvement situations?	very little ☐ little ☐ medium ☐ much ☐ very much ☐	for the choices very much, much, medium, little, and very little, amounts 1, 0.75, 0.5, 0.25, and 0 are assigned respectively

System's Rule Set
Results Section
The first rule (Trends):
IF $A*(Data_{t-2} - Data_{t-3})>0$ **AND** $A*(Data_{t-1} - Data_{t-2})>0$ **AND** $A*(Data_t - Data_{t-1})>0$ **THEN** trend=1 **ELSE** trend=0
In other words, if the amounts of indicator have a good trend during 4 years (the value of the indicator is better than the previous year), then the amount of trend would be 1, otherwise it would be 0 (1 means appropriate trend and 0 means inappropriate trend).

The second rule (Goals):
IF $A*(Data_t - goal_t)>=0$ **AND** B=1 **AND** C=1 **THEN** goal=1 **ELSE** goal=0
In other words, if the indicator has been able to reach the goals and the goals are aligned with organizational strategy and regarding the organization's situation it is possible to reach the identified goals and the values of goals are defined rationally according the easiness of achieving them, then the amount of goals are 1, otherwise they are 0.

The third rule (Comparison):
IF $comparison_t$<>Null **AND** $comparison_{t-1}$<>Null **AND** $comparison_{t-2}$<>Null **AND** $comparison_{t-3}$<>Null **THEN** comparison=1 **ELSE** comparison=0
In other words, if the comparison is done for all values of indicator during 4 years, then the value of comparison equals 1, otherwise it equals 0.

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Enablers Section
The fourth rule (Approach Rationality):
IF A=1 **AND** trend=1 **AND** A*(Data$_t$ - goal$_t$)>=0 **AND** B=1 **AND** C=1 **THEN** rational=1 **ELSE** rational=0
In other words, if the information of the results feedback column is affected by the approach element, the trend of indicator values are appropriate during 4 years, the indicator has been able to reach the goal, the goals are aligned with the organizational strategy, regarding the organization's situation it is possible to reach the identified goals, and the values of goals are defined rationally according the easiness of achieving them, then the amount of approach rationality is 1, otherwise it is 0.

The fifth rule (Systematic Implementation of the Approach):
IF A=2 **AND** trend=1 **AND** A*(Data$_t$ - goal$_t$)>=0 **AND** B=1 **AND** C=1 **THEN** systematic=1 **ELSE** systematic=0
In other words, if the information of the results feedback column is affected by the settlement element, the trend of indicator values are appropriate during 4 years, the indicator has been able to reach the goal, the goals are aligned with the organizational strategy, regarding the organization's situation it is possible to reach the identified goals, and the values of goals are defined rationally according the easiness of achieving them, then the amount of systematic approach implementation is 1, otherwise it is 0.

The sixth rule (Analyzing and Using Results):
IF A=3 **AND** trend=1 **AND** A*(Data$_t$ - goal$_t$)>=0 **AND** B=1 **AND** C=1 **THEN** analysis=1 **ELSE** analysis=0
In other words, if the information of the results feedback column is affected by the element, the trend of indicator values are appropriate during 4 years, the indicator has been able to reach the goal, the goals are aligned with the organizational strategy, regarding the organization's situation it is possible to reach the identified goals, and the values of goals are defined rationally according the easiness of achieving them, then the amount of analyzing and using results is 1, otherwise it is 0.

Extracting Points of Strength and Weakness
Results Section
IF trend=1 **THEN** indicator has a good trend **ELSE** indicators have not good trends
In other words, if the response of the first rule (i.e. Trends) is 1, then it could be told that there is information related to each year and indicator has a good trend, otherwise the indicator does not possess a good trend.
IF goal=1 **THEN ELSE** the goals are not achieved
In other words, if the response of the second rule (i.e. Goals) is 1, then it could be told that the goals are determined and achieved, otherwise they are not achieved.
IF comparison=1 **THEN ELSE** the comparison are not for all years
In other words, if the response of the third rule (i.e. Comparison) is 1, then it could be told that the comparisons are conducted for all years, otherwise they are not conducted for all years.
IF D=1 **THEN**
In other words, if the answer to question "Based upon the descriptions of the cause section, is there any cause and effect relationship between approach or implementation or evaluation and revision and the values of this indicator?", which is asked from user by the system, is 'yes', then based upon the descriptions provided in cause section, there are cause and effect relationships between the approach and the indicator, otherwise there is no such relationship between them.
IF E=1 **THEN** this indicator covers all areas **ELSE** this indicator doesn't cover all areas
In other words, if the response to question "How many areas has been covered by the indicator?", which is asked from user by the system, is 'almost all areas', then it could be said that this indicator covers all areas, otherwise the indicator does not cover all areas.

Enablers Section
Suitability of approach:
IF average(G, H, rational)<0.25 **THEN** there is not any evidence that approach is suitable **ELSE IF** 0.25<average(G, H, rational)<0.5 **THEN** there are a few evidences that approach is suitable **ELSE IF** 0.5<average(G, H, rational)<0.75 **THEN** it's partly evidence that approach is suitable **ELSE IF** 0.75<average(G, H, rational)<1 **THEN** there are explicit evidences that approach is suitable **ELSE IF** average(G, H, rational)=1 **THEN** it's comprehensive evidence that approach is suitable
In other words, if the average of the answers to the questions "Is the process defined and formulated well?" and "Is it focused on the demands of stakeholders?" and the rule of "Rationality", which is asked from user by the system, is less than 0.25, then it could be said that there is no evidence for suitability of the approach. Else, if the average is between 0.25 and 0.5, then the existence of a few evidences for suitability of approach could be concluded. Else, if the average of responses is between 0.5 and 0.75, then it could be claimed that it is partly evidenced that the approach is suitable. Else, if the average is between 0.75 and 1, then the existence of explicit evidences for approach suitability is concluded. Else, if the average equals 1, then there are comprehensive evidences that the approach is suitable.

Integrity of approach:
IF average(I,J)<0.25 **THEN** there is not any evidence that approach is Integrated **ELSE IF** 0.25<average(I,J)<0.5 **THEN** there are a few evidences that approach is Integrated **ELSE IF** 0.5<average(I,J)<0.75 **THEN** it is partly evidenced that approach is Integrated **ELSE IF** 0.75<average(I,J)<1 **THEN** there are explicit evidences that approach is Integrated **ELSE IF** average(I,J)=1 **THEN** there are comprehensive evidences that approach is Integrated

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In other words, if the average of the answers to the two questions "Is the approach supporting strategy and policy?" and "Is it related to other approaches?" , which are asked from user by the system, is less than 0.25, then it could be said that there is no evidence for integrity of the approach. Else, if the average is between 0.25 and 0.5, then the existence of a few evidences for integrity of approach could be concluded. Else, if the average of responses is between 0.5 and 0.75, then it could be claimed that it is partly evidenced that the approach is integrated. Else, if the average is between 0.75 and 1, then the existence of explicit evidences for approach integrity is concluded. Else, if the average equals 1, then there are comprehensive evidences that the approach is integrated.

Implementation of approach:
IF K<0.25 **THEN** there is not any evidence that approach is implemented **ELSE IF** 0.25<K<0.5 **THEN** there are a few evidence that approach is implemented **ELSE IF** 0.5<K<0.75 **THEN** it's partly evidenced that approach is implemented **ELSE IF** 0.75<K<1 **THEN** there are explicit evidences that approach is implemented **ELSE IF** K=1 **THEN** there are comprehensive evidences that approach is implemented
In other words, if the average of the answers to the question "Is the approach implemented?", which is asked from user by the system, is less than 0.25, then it could be said that there is no evidence for implementation of the approach. Else, if the response is between 0.25 and 0.5, then the existence of a few evidences for implementation of approach could be concluded. Else, if the response is between 0.5 and 0.75, then it could be claimed that it is partly evidenced that the approach is implemented. Else, if the response is between 0.75 and 1, then the existence of explicit evidences for approach implementation is concluded. Else, if the response equals 1, then there are comprehensive evidences that the approach is implemented.

Systematic implementation of the approach:
In other words, if the response to the rule "Systematic Implementation of the Approach" is less than 0.25, then it could be said that there is no evidence for systematic implementation of the approach. Else, if the response is between 0.25 and 0.5, then the existence of a few evidences for systematic implementation of approach could be concluded. Else, if the response is between 0.5 and 0.75, then it could be claimed that it is partly evidenced that the approach is implemented systematically. Else, if the response is between 0.75 and 1, then the existence of explicit evidences for systematic approach implementation is concluded. Else, if the response equals 1, then there are comprehensive evidences that the approach is implemented systematically.

Measuring the effectiveness of the approach:
IF M<0.25 **THEN** there is not any evidence that approach is measured **ELSE IF** 0.25<M<0.5 **THEN** there are a few evidence that approach is measured **ELSE IF** 0.5<M<0.75 **THEN** it's partly evidenced that approach is measured **ELSE IF** 0.75<M<1 **THEN** there are explicit evidences that approach is measured **ELSE IF** M=1 **THEN** there are comprehensive evidences that approach is measured
In other words, if the response to the question "Is the effectiveness and of the approach measure regularly?" which is asked from user by the system, is less than 0.25, then it could be said that there is no evidence for measurement of the effectiveness of the approach and its implementation. Else, if the response is between 0.25 and 0.5, then the existence of a few evidences for measurement of the effectiveness of the approach and its implementation could be concluded. Else, if the response is between 0.5 and 0.75, then it could be claimed that it is partly evidenced that the approach effectiveness is measured and implemented. Else, if the response is between 0.75 and 1, then the existence of explicit evidences for measurement of the effectiveness of the approach and its implementation is concluded. Else, if the response equals 1, then there are comprehensive evidences that the approach is measured and implemented.

Learning activities:
IF N<0.25 **THEN** there is not any evidence that approach is **ELSE IF** 0.25<N<0.5 **THEN** there are a few evidence that approach is **ELSE IF** 0.5<N<0.75 **THEN** it's partly evidenced that approach is **ELSE IF** 0.75<N<1 **THEN** there are explicit evidences that approach is **ELSE IF** N=1 **THEN** there are comprehensive evidences that approach is
In other words, if the response to the question "Is the learning activities used for identifying and sharing the best activities and improvement situations?", which is asked from user by the system, is less than 0.25, then it could be said that there is no evidence for learning activities. Else, if the response is between 0.25 and 0.5, then the existence of a few evidences for learning activities could be concluded. Else, if the response is between 0.5 and 0.75, then it could be claimed that it is partly evidenced that the approach is . Else, if the response is between 0.75 and 1, then the existence of explicit evidences for learning activities is concluded. Else, if the response equals 1, then there are comprehensive evidences that the approach is.

Improvement activities:
IF analysis<0.25 **THEN** there is not any evidence that approach is improvable **ELSE IF** 0.25<analysis<0.5 **THEN** there are a few evidence that approach is improvable **ELSE IF** 0.5<analysis<0.75 **THEN** it's partly evidenced that approach is improvable **ELSE IF** 0.75<analysis<1 **THEN** there are explicit evidences that approach is improvable **ELSE IF** analysis=1 **THEN** there are comprehensive evidences that approach is improvable
In other words, if the response to the rule "Analyzing and Using the Results" is less than 0.25, then it could be said that there is no evidence for analysis and exploitation of results. Else, if the response is between 0.25 and 0.5, then the existence of a few evidences for analysis and exploitation of measurement results

for improvement could be concluded. Else, if the response is between 0.5 and 0.75, then it could be claimed that it is partly evidenced that the measurement results are analyzed and used for improvement. Else, if the response is between 0.75 and 1, then the existence of explicit evidences for analysis and exploitation of measurement results for improvement is concluded. Else, if the response equals 1, then there are comprehensive evidences that the measurement results are analyzed and used for improvement.

Score of each Activity and Sub-criterion
Results Section
For computing the score of each indicator, regarding the scoring method in EFQM model, the following formula is used:
Indicator score = 0.5 × AVERAGE (rounded score, goals, comparison, reason) + 0.5 × score
For computing the score of each sub-criterion, the scores of the indicator of that sub-criterion are averaged and then for calculating the score of each criterion, the scores of all of its sub-criteria are averaged.

Enablers Section
For computing the score of each activity, regarding the scoring method in EFQM model, the following formula is used:
Approach score = AVERAGE (approach integrity score, approach suitability score)
 Score = AVERAGE (approach implementation score, approach structured implementation score)
 Score = AVERAGE (results analysis, learning activities score, approach effectiveness and measurement)
For computing the score of each sub-criterion, the scores of the indicator of that sub-criterion are averaged and then for calculating the score of each criterion, the scores of all of its sub-criteria are averaged.

Organization's Total Score
Finally for computing the total score of organization, based on the weights determined in EFQM model (version 2010), the following formula is used:
Organization score = 1 × (people score + employees score + processes + partnerships and resources + employees + policy and strategy + leadership indicator score) + 1.5 × (key performance results + customer results indicator score)

APPLICATION OF THE DESIGNED EXPERT MODEL IN LOCAL POWER COMPANY

The expert model designed in this paper is applied to the local power company of Yazd (i.e. a city in the middle of Iran), and the results is compared with the current methods, which indicated no significant difference between the outcomes. Consequently, it could be concluded that the proposed method could be a substitute for the current methods.

CONCLUSIONS

The aim of designing fuzzy expert system for organizational performance assessment is automation of assessment process regarding the information provided to the system about the situation of organization. The result is scoring the criteria and finding the strength and weakness points of the organization. The advantage of this method, besides facilitating the assessment, is independence of the assessment results of the personal opinions of the expert, which could introduce this method as a reliable and comprehensive method for assessing all organizations. Furthermore, using fuzzy logic, determining the scores of approach, settlement, evaluation and revision, and results is expedited and unlike the current methods, in which it is possible to have different scores by different persons for one particular criterion, in this method, the scores are defined in a standard format and the accuracy and speed of assessment are improved.
Regarding that the application of expert systems in performance assessment is not attended yet, utilization of this method could be a new step into this road. The design of expert system could not be of benefit, unless it is customized and examined in different organizations, which could be the subject of future further researches.

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ARTICLE

INVESTIGATION OF THE FACTORS AFFECTING THE DEFERRED DEBTS IN COMMERCIAL BANKS AND PRESENTATION OF APPROPRIATE MARKETING STRATEGIES TO REDUCE THEM (CASE STUDY - FACILITY GRANTED BY THE BMI BRANCHES OF GILAN PROVINCE)

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ABSTRACT

Macroeconomic conditions and government interventions in the economy as well as the trade cycles formed in the context of the global economy can stimulate the profitability of the corporations and individual borrowers and affect a total of facility and deferred debts of the banking system. This study examines the effective factors in creating deferred debts at the BMI (Bank Melli Iran/Iran National Bank) branches of Gilan Province from 2010 to 2014. In this paper, we have selected the files, having the largest deferred liabilities to each of the BMI branches, that their resolutions have been issued by the Province Committee and the information needed for investigation and analysis was extracted with reference to them. In this study, all the branches of Gilan province have been divided into five districts of Central, North, West, East, and South. In each district, 131 files of deferred debts have been separately and randomly identified and evaluated during the mentioned period. Chi-square test has been used for analyzing the data and testing the research hypotheses, and Cramer's V coefficient has been applied to determine the most effective factor in each district. All calculations have been done with SPSS statistical Software. Regarding the data analysis, the results revealed that there is a significant relationship between type of economic activity, duration of payment credits, type of credit, type of collaterals received, and type of payment credit with deferred debts in all districts. Then the effect of each factor was separately studied in each of the five districts. And finally, the appropriate marketing strategies were designed and proposed in order to reduce deferred debts.

INTRODUCTION

I *Different countries' experience has shown that the deterioration in the balance sheets of the banks and the banking system is the starting point for most of the economic crises at the national and international levels. In many countries, increasing the share of loans in proportion to the bank assets is the primary cause for the deterioration in the banks' balance sheets. the importance and sensitivity of the banking system in regulating domestic economic relations and occasions of each country on one hand; and its tremendous impact on the scene of the global economy and the facilitation and promotion of international trade, on the other hand, caused economic experts to consider "banks" as one of the factors for the economic development and the formation of countries' productivity potential. Banks are considered as one of the most important tools for implementing monetary policy under the power of each country's government and economic system, because they collect small savings and the funds caught in the hands of people on one hand, and in line with the implementation of regulated and obligated economic and credit policies, they allocate financial resources to the intended sectors on the other hand, and inevitably confront a series of issues and problems that are essential to be noticed. One of the most fundamental problems that banks are facing today is the problem of deferred debts. [1]*

A bank's deferred debt is the outcome of the economic conditions and a high inflation level and also highlights the poor performance of the bank in the management of their resources and expenditures. It is obvious that the increased deferred debts of banks makes banking resources rather less than banking expenditures, causing the reduction of bank facility-granting and wider consequences at the national level including inflation growth and the development of brokerage and underground economy [2] . Competition in the banking sector is typically considered as the stability of financial losses. When banks intensify their competition in depositing, their franchise value disappears; in this case banks have more motivation to perform high-risk activities, leading to the risk of increasing the rate of deferred debts. This debate can be very important and effective in regulating the banking system all around the world [3]. On the other hand, with privatization and public offering in the capital market, stressful factors change the stock price and institutions' profitability is of the highlights in the decision-making of participants to take part in the capital market; therefore the factors affecting profitability are: the amount of capital, the amount of resources, the quality of expenditures, the status of debts and liabilities .[4]

1.2. Problem Statement:

One of the key elements of any economic system is banking system that its correct and principal function may contribute to the growth and prosperity of economic system; otherwise, the sculpture of the economy will be heavily shocked. One of the problems which the banking system of various countries such as Iran

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faces is to increase the amount of expired and deferred debts of the banks showing off like a frozen ocean to the total facilities granted in banking network. This represents a decline in the quality of the banking network's assets and consequently leads to probably financial instabilities. Since the banking system bears all the burden of a country's financial system, the decrease in the amount of these debts indicates the banks' ability to preserve available resources and the high amount of these current facilities indicates a threat to the banking resources and undoubtedly a national concern. The main goal of financial institutions and banks is to attract low-cost resources and effective expenditures (granting facility) and to reduce the claims and ultimately profitability. A bank with less deferred debts can invest its released resources on other new activities or accept further payment obligations that consequently it increases the bank's programming potential in connection with the consumption of resources or acceptance of obligations and acquisition of income. Due to the sensitivity of the subject and according to the basic paper, in this study we attempt to examine the influence of in-house factors on the creation of deferred debts and to propose new solutions from marketing perspective to reduce claims and to answer a fundamental question as follows:

Is there a significant relationship between the deferred debts as a dependent variable and the duration of credit, type of collateral, use cases, economic activity and type of payment credit as the independent variable?

1.3. The importance of research:

To illustrate the necessity and importance of the topic of the current research, the following cases can be proposed:

1. Ratio of non-current debts to the total debts (NPL) is considered as one of the main criteria for studying a bank's soundness of performance so that with a glance at this indicator in the banking system of developed countries and according to the statistics of the global banks from 2009 to 2013, its value has been announced as 2.3% for America, 3.2% for Japan, 4.3% for France and 1.4% for Australia on average. However, according to the declaration of Valiollah Saif, the governor of the Central Bank of Iran, statistics related to NPL in the country banking system is equal to 6.15%. These figures may be compared with the ratios of the countries such as Pakistan, Bosnia and Herzegovina and Ghana . [5]

2. Due to the article 44 of the constitution and necessity to implement it in the promotion and transparency of the country's economic and fiscal system, banks are considered as the axis of these changes and variations, therefore the existence of expired and deferred debts is considered as an obstacle on the way of privatization.

3. On the other hand, with privatization and public offering in the capital market, stressful factors change the stock price and institutions' profitability is of the highlights in the decision-making of participants to take part in the capital market; therefore the factors affecting profitability are: the amount of capital, the amount of resources, the quality of expenditures, the status of debts and liabilities.[6]

4. The role of the government should also be considered in pricing fairly in the banking sector. The importance of this issue in the banking sector will become more obvious when it has a transparent system of fairly pricing, but if the financial statements of the banks are opaque and non-transparent, they will face the excessive risk, leading to increase banks' deferred debts in long-term period . [7]

Research questions:

Thus, the following questions arise in this research on the basis of a conceptual model:

1. Is there any significant relationship between the independent factors such as type of credit, duration of credits, type of collateral, the use cases and deferred debts as the dependent variable?

2. Which of the independent variables has the greatest effect on deferred debts?

3. What is the appropriate marketing strategy to reduce debts?

Research purposes:

Undoubtedly, one of the most important challenges the banking system has faced over the past few years has been the increasing trend of deferred debts induced from granting unreal, non-expert and improper facilities. It has also affected on money-market networks and banking system performance and increasingly weakened banks' lending potential. Since today all banks, both public and private, as well as financial and credit institutions face a major problem called deferred debts for various reasons such as the economic situation, macroeconomic policies of the central bank, government intervention in the facility-granting process and domestic weaknesses of institutions, and since the title of this research is completely practical and related to the study of the effective factors on creating the deferred debts and the ways to reduce them, this research can be used by these banks and institutions to deal with this phenomenon in banking system. Due to the stated subjects, the following practical purposes can be provided for the research:

1- Studying the in-house factors affecting the deferred debts, including systemic ways for granting facilities
2- Studying the significance of the relationship between dependent and independent variables
3- Identifying the most effective parameter on the deferred debts among the independent variables
4- Explaining the concept of marketing at the bank and its relationship with deferred debts
5- Considering the deferred debts from a marketing management viewpoint, out of a traditional look and financial management
6- Designing marketing strategies using the opinions and guidelines of the group of experts and specialists in marketing and providing proper solutions for planning, implementing and monitoring

1.6. Theoretical framework for the research:

This research has been carried out, using a research model by Dr. Rostomian et al., under the title of the study of the factors affecting the creation of the deferred debts of the industrial and commercial banks (case study, the branches of Mellat Bank of Kish Free Zone) in 2010. Variables used in that study have

been determined with the consultation of a group of experts and specialists in banking. The mentioned research was published at No. 29 of Accounting and Finance Bulletin in the same year. The purpose of using this model is to study the systemic and controllable in-house factors that create deferred debts. Independent variables of this pattern include economic activity, duration of credit, uses of credits, type of payment credit, and type of received collaterals. And dependent variable is the deferred debts.
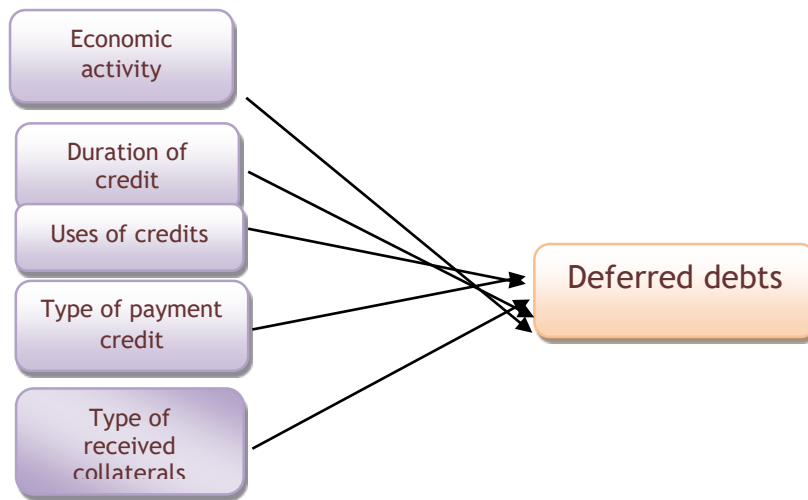

Figure 1.1.Conceptual model of the research [source:7]

In this model, the deferred debts are considered as a dependent variable and the factors such as economic activity, duration of credits, uses of credits, type of credits, type of collaterals and fluctuations in exchange rate are considered as independent variables.

Hypotheses

According to the studies based on the previous researches and the interviews conducted with senior managers of the bank's credit sector and regarding the obtained evidences on this issue, the following hypotheses were formulated.[7]

Hypotheses for the causes of creating the deferred debts:

1. There is a significant relationship between type of economic activity and creation of deferred debts.
2. There is a significant relationship between duration of the offered credits and creation of deferred debts.
3. There is a significant relationship between type of the uses of the offered credits and creation of deferred debts.
4. There is a significant relationship between type of payment credit (contracts/Oqood) and creation of deferred debts.
5. There is a significant relationship between type of received collaterals and creation of deferred debts.

Theoretical and operational definitions of variables

The Cabinet approved a regulation on 26 Jan 2007 for the collection of expired, deferred and bad debts of the credit institutions (Rial and Foreign Currency) and notified it to the Central Bank, Ministry of Economic Affairs and Finance, Ministry of Justice, Ministry of Labor and Social Affairs for implementation. According to the article 1 of this regulation, a number of terms and phrases related to the reorganization plan of deferred debts are defined as follows:

Current debts

The debts that their interest and principal repayment is paid in specific maturities or that more than two months have not passed from their maturity date

Expired debts

The debts that more than two months have passed from maturity date of their interest and principal or more than two months have passed from cut-off date of their installment repayment but have not exceeded six months yet

Outstanding debts

The debts that more than 6 months and less than 18 months have passed from the maturity date or installment repayment

Doubtful debts

The debts that more than 18 months have passed from maturity date or cut-off date of their installment payment

Bad debts

That portion of the credit institutions' debts that, regardless of the maturity date, is not collectable for certain reasons such as a debtor's death or bankruptcy or other causes and is considered as bad debts by the approval of the Board of Directors of the credit institutions.[8]

Economic activities:

Standard classification for all economic activities is formed from an integrated structure, relying on a set of concepts, definitions, and classification principles and rules. It also provides a comprehensive framework in which the economic data such as deferred debts can be collected in form of a stereotype designed for the analysis, planning, decision-making and economic policy-making. Classification is practically used to provide a continuous flow of information essential for monitoring, analysis and evaluation of the functioning of an economy over time. [8]

In this paper, the economic activities are classified into the following five groups based on the research model [9] and related to banks:

1. Agriculture: in the form of civil partnership facility of forward sales and installment sales for agricultural implements

2. Commerce and Services: in the form of facility of installment sales for the purchase of goods and the facility of Mudaraba

3. Export: In the form of the documentary credit and the opening of LC

4. House and Building: In the form of the facility of Jualah, hire purchase and civil partnership in building and construction

5 – Industries and Mines: in the form of the facility of quick-impact projects and installment sales

Duration of credits

In this study, based on the duration of credits the facilities granted are classified into three groups: (1) less than one year, (2) one to three years and (3) more than three years.

Type of payment credit

Based on the structure of the facilities granted by banks being in accordance with the instructions of the Central Bank, in this research, type of facilities granted to the customers is classified into seven groups as follows:[10]

1. Mudaraba
2. Civil partnership
3. Installment sale
4. Hire purchase
5. Jualah
6. Gharz-ol-Hasanah (beneficence loan)
7. Documentary credit

Type of collateral

The Persian translation of the word "collateral" (Wasiqa) literally means "firm", "what can be trusted" and "some kind of precautionary guaranteed measure" but it technically refers to any movable or immovable property that a borrower gives to a lender in exchange of a loan under one of the legal forms such as mortgage or conditional transactions. If the loan is not timely repaid, the lender can collect the borrower's total or partial claim after selling the pawned collateral. [10]

Based on the instructions issued by the Central Bank, there are two types of collaterals, including movable (portable) and immovable (non-portable). Banks usually receive four groups of the following collaterals belonging to one of those two types:

1. Promissory note (movable)
2. Estate (immovable)
3. Enforceable contract (guarantee of the third parties) (movable)
4. Long-term investment deposits of the customers (movable)

Type of use

In this research, in order to identify and clarify the use of the facilities granted to the customers, type of capital used in the facility has been considered.

In this study, capital is divided into two types: working capital and fixed capital.

Working capital

That portion of the current assets provided from long-term financial sources is called working capital. Gross working capital and net working capital are defined as total current assets and surplus of current assets in proportion to the current liabilities, respectively. The working capital is an indicator to determine liquidity rate of a company, especially when used in comparison with other indicators and financial ratios.

Fixed capital

That portion of the capital manifested in the form of production, tools, and raw materials is called fixed capital. It is referred to as fixed, because it cannot add more than its own value to the product value. Fixed capital is divided into fluid and patient capital. [11]

The definition of bank facilities

According to the central bank's definition, the purpose of facilities both monetary and foreign exchange includes facilities granted to natural and juridical persons, clients' liabilities in temporary debtors' account, loans from foreign-exchange reserves, clients' liabilities in the form of documentary credits and paid letters of guarantees, clients' liabilities on documentary credits and paid term bills of exchange, facilities granted for the prepayment of "the purchase of properties of transactions", "properties purchased for contracts", "commodity of the forward transactions" and "working in Jualah and factoring documents and purchased bills of exchange".[12]

Deferred debts as a supply and demand market

From the marketing perspective, banks consider the "deferred debts" category as a supply and demand market in which there is a certain product, called deferred debts, and a bank's goal is to make a balance between supply and demand.

In this market, banks are the suppliers of the product (deferred debts) and the borrowers, with overdue or deferred installments, are the demanders. With regard to this shape of the market, marketing strategies proportional to this pattern can be discussed and examined. Before proposing the related strategies, marketing concepts in banks are described.

Marketing plans to reduce debts

a) Conversion Marketing

The category of deferred debts is considered as a supply and demand market in which the debts are supplied as a product and also the debtors actually pay their liabilities to the bank by purchasing this product. It is clearly evident that the demand in this market is negative and the debtors have no propensity to pay their debts for various reasons such as poor economic conditions, lack of timely payment of installments, being time-consuming of payment of installments and the other factors.[13] In a market where demand is negative, a conversion marketing strategy should be used. Here the marketing's function is to analyze and explore the ways to attract the customers and collect the debts and whether it is possible to turn the market demand from negative into positive, using a compiled marketing program and a revision to the method of collecting debts and lower selling prices (lower percentage of delay penalties) and better promotional advertisements. Promotional advertising for sales can be used to increase sales in the short term, access the market share in the long term, retain previous customers and/or hunt the new ones.

b) Direct marketing

Direct marketing is a form of marketing in which a suspicious customer is directly communicated with. In this way, the people who are marketed are directly chosen from the target market that is the same market of deferred debts. The advantage of direct marketing is that it can be measured and sued, in order that marketing success rate can be determined; this feature helps greatly in measuring the amount of the debt collection. It means that the percentage of marketing success can be determined by dividing the number of people encouraged in different ways to pay their debts in the market by the number of people who have referred. This type of marketing utilizes a variety of communication tools such as post, e-mail, SMS and fax. In some cases, the direct marketing can be done by the use of cookies stored in the web browser. In this case, debt collection agents can act as direct marketers in advertising campaigns formed by banks and in addition to phone calls and face-to-face references that are usually unpleasant and annoying for the customers, they can also experience other communication ways with the mentioned communication tools.[14]

c) Relationship Marketing

The other strategy that can be used in the market of deferred debts is the relationship marketing. This type of marketing is today's art of business. The creation of proper relationship is absolutely essential in order to retain available key customers and attract new ones as debtors to the bank [15]. Today every customer either as a depositor or as a debtor has its own special value. The main goal of relationship marketing is to create a stable and secure relationship with a customer of any kind. Creation of such a relationship with the customers who are the subjects of this study and have deferred installments is also very complex and has its own psychological subtlety. Technical and moral compliance with these subtleties in the bargaining process to collect installments is completely necessary.

d) Creativity and innovation in debts market

Modernity, rarity, and how to utilize are three main characteristics of innovative methods that can be used in marketing. Similarly, an important prerequisite for being successful and receiving payments in debts market is to use innovative methods different from the other competitors and banks which have all the above-mentioned features.

Materials AND Methods

According to the specialists, research methodology is a set of rules, tools, valid methods and systematic ways to examine realities, to discover unknowns and to access the solutions. Since the aim of the current study is to investigate the factors affecting the creation of deferred debts and to provide solutions to prevent creating new debts in order for the optimal consumption of facility in different economic sectors, methodologically the current paper is a kind of survey, description and correlation research.

Statistical population and sample

In this study, the statistical population contains total facilities granted to customers in the BMI branches of Gilan province, with more than three deferred installments. A list of facilities for each separate district was provided based on the spatial domain of the research for each district with reference to the Facility Section of Gilan Branches Affairs Office and Statistics, Informatics and Comprehensive Management System Department recently designed and used in banks. In this statistical population, sampling was taken from the people who had the most deferred debts in each branch of BMI.

421 files in the central district (the largest number), 392 files in the North, 364 files in the West, 359 files in the East and 340 files in the south were identified as deferred debts.

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Since each district should be investigated and analyzed separately and in order to facilitate and accelerate in the process of data analysis and statistical tests, the average of 375 files as the statistical population of each district was calculated and after being replaced by Cochran's finite population formula 131 files were determined as a statistical sample size. Referred to the Comprehensive Management System, 131 files were randomly selected in each district and then by reviewing the facility files available at the branches, the necessary information for analyzing the data was extracted.

A sample is a set of signs, selected from a part of a group or a larger population, describing the qualities and characteristics of that part of a group or population. Sampling is a process of selecting a sufficient number of statistical population members. By studying the sample group and finding its properties, the observed characteristics can be generalized to the statistical population members. Random sampling is a method of selecting a part of the population in which the probability of selection is the same for all samples.

Sampling method and sample size

The sample size should be so chosen that it can be generalized to the entire population. For this reason, in order to determine the minimum required sample size, due to limitation of the statistical population study, the following formula (the finite population) is used to calculate the sample size formula

$$ n = \frac{N\left(Z_{\frac{\alpha}{2}}^2\right)pq}{(N-1)d^2 + \left(Z_{\frac{\alpha}{2}}^2\right)pq} $$

Where,

n=131, the sample size
N=375, the statistical Population size
P: is a proportion for the presence of the attribute in the statistical population. Here variance is considered as a maximum level, and then P=0.5
P or 1-p: is a proportion of the absence of the attribute in the statistical population. Here, since p=0.5, then the result of q=1-p is equal to 0.5.
Z: in this study, with regard to the significance level of 0.95, Z value is equal to 80.31.
d: is the desired probability precision (error level) which is here considered as 0.1.

375 facility files as the statistical population of each district were calculated and after being replaced by Cochran's sample size formula, 131 files were determined as a statistical sample size. Referred to the Comprehensive Management System, 131 files were randomly selected in each district and then by reviewing the facility files available at the branches, the necessary information for analyzing the data was extracted

Having replaced the number 375 (of the facility files) into Cochran's sample size formula, the final sample of 131 files was obtained. Then the necessary information for analyzing the data was extracted, referring to the customers' files randomly selected.

Field of study

This study examines the factors affecting deferred debts of the banks and presents the appropriate marketing strategies to decrease them, conducted at the BMI branches of Gilan province. In order to facilitate the collection, analysis and classification of data, BMI branches of the province have been divided into five districts of Central, North, South, East, and West. In time terms, facilities granted to customers in a five-year span from 1388 to 1392 Solar Hijri (2009-2013) in the form of Islamic contracts (Oghud) at the BMI branches of Gilan province were examined and analyzed. The current research variables include deferred debts, type of collateral, type of use, type of activity, type of payment credits and the credit period which are studied in the fields of financial management and marketing management, providing the appropriate solutions.

Statistical data analysis

The analysis was done by means of inferential statistics and SPSS statistical software version 19. To analyze the data, Chi-square test and Cramer's V coefficient were used in order to determine the most effective factor. According to the studies based on the previous researches and the interviews conducted with senior managers of the bank's credit sector and evidences obtained for this issue, the research hypotheses were formulated.

In this study, in order to investigate the factors affecting the creation of debts and determine the intensity of effect of each factor, on the basis of information obtained from deferred facility files based on the statistical sample, the following analyses were conducted by chi-square test and Cramer's V coefficient. These analyses were conducted separately in five districts of Gilan province.
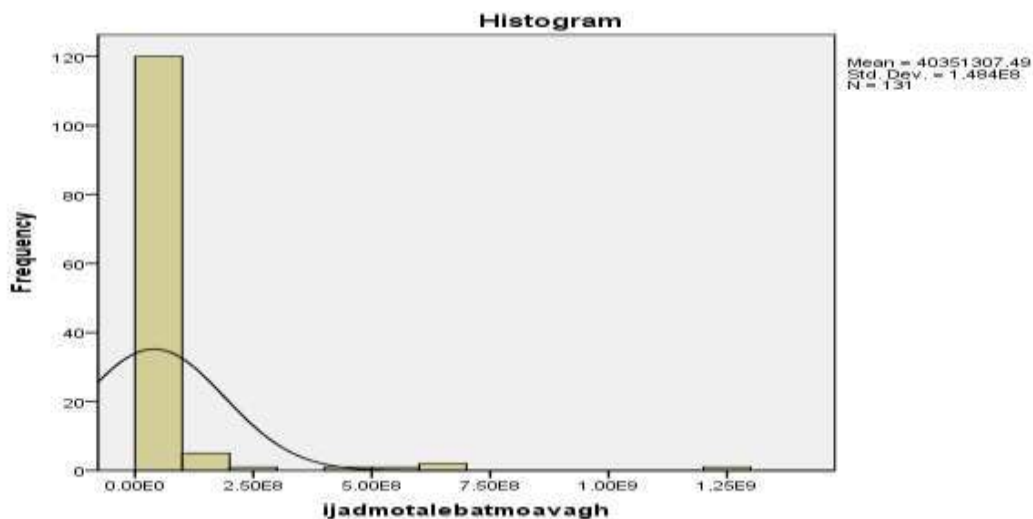
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Statistical test of the research hypotheses in the central district
The following data and statistical indicators were calculated by means of SPSS software for data analysis:
Table 4.*1.*Statistical indicators of deferred debts (variable) for the sample in the central district

Number	131
error	2
Mean	40351307.4885
Median	900000.0000
Mode	41000.00[a]
Std. Deviation	1.48389E8
Variance	2.202E16
Skewness	5.985
STD. Error of Skewness	.212
Kurtosis	41.665
STD. Error of Kurtosis	.420
Minimum	990.00
Maximum	1.28E9
Sum	5.29E9

Figure 4.1. *A frequency distribution histogram of deferred debts in the central area*

Hypothesis 1: There is a significant relationship between type of economic activities and the creation of deferred debts.

According to the studies conducted, most of the deferred debts are related to the commerce and service sector and the results indicated further effect of this sector on deferred debts. Similarly, by more examinations and accurate tests it was clearly specified that the commerce and service sector, having higher amount of deferred debts, had a greater effect on the BMI deferred debts. For this reason, new standard procedures need to be applied to grant facility in the commerce and service sector; so as to control more at the facility-granting stages and to prevent the creation of more deferred debts in this sector.

As shown in Table 1, the critical statistic for the chi-square test at the 95% confidence level and with 4 degrees of freedom equals to 9.488 and at the 99% confidence level is equal to 13.277. According to the calculations conducted, the value of 201.405 for chi-square statistic has been observed. Since the calculated chi-square statistic is greater than the critical values of 9.488 and 13.277 with 4 degrees of freedom, sample test function is located at both 95% and 99% confidence levels in the critical area, and this statement can also be observed in the SPSS output with Sig smaller than the error level of the test 0.05 and 0.01, so the null hypothesis is rejected and the opposite hypothesis as the accurate hypothesis is accepted. Similarly, Cramer's V coefficient is equal to 0.899.

Table 4.2.Chi-square test results for the hypothesis 1

Indices of chi-square test		Difference	expected numbers	Observed numbers	Type of activity
201.405	X² statistic	-24.2	26.2	2	Farming
4	degrees of freedom	-5.2	26.2	21	Industry and mining
0.00	Margin of error	63.8	26.2	90	Commerce and services
0.889	Cramer's V coefficient				
critical statistic at two levels		-16.2	26.2	10	House and building
9.488	X²$_{95\%,4}$	-18.2	26.2	8	Exports
13.277	X²$_{99\%,4}$			131	Total
The null hypothesis has been rejected at both confidence levels, thus the research hypothesis is accepted.					Test result

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critical statistic at two levels		-16.2	26.2	10	House and building
9.488	$X^2_{95\%,4}$	-18.2	26.2	8	Exports
13.277	$X^2_{99\%,4}$			131	Total
The null hypothesis has been rejected at both confidence levels, thus the research hypothesis is accepted.					Test result

Hypothesis 2: There is a significant relationship between duration of the offered credits and the creation of deferred debts.

A facility is divided into three groups in terms of the period of time: (1) less than one year (2) one to three years and (3) more than three years. The number of deferred debts created in a facility of the second group type (1-3 years) has been reported more than that of the groups 1 and 3. According to the investigations conducted and the interview arranged with senior managers of the bank, it probably seems that most of the facilities were offered in the commerce and service sector and in the form of Mudaraba contracts and documentary credits, and facility receivers must have settled their debts after selling the goods subject to each of the above contracts; whereas, due to the remaining time until the credit maturity, they adopted to reinvest the above-mentioned capital into the other fields such as housing, leading to a delay in repayment of the received facilities because of the necessity to stop the house construction at least for one year.

As a result, continuous monitoring at the time of spending credits and receiving stronger collaterals can be a temporary solution. As you can see in Table 3, the critical statistic for the chi-square test at the 95% confidence level and with 2 degrees of freedom shows the value 5.991 and the 99% confidence level equals to 9.210. According to the calculations carried out, the value of 63.496 for chi-square test statistic has been observed. Since the chi-square (X^2) statistic is greater than the critical value at both levels, sample test function is located at both 95% and 99% confidence levels in the critical area, and this statement can also be observed in the SPSS output with Sig smaller than the error level of the test 0.05 and 0.01, so the null hypothesis is rejected and the opposite hypothesis as the accurate hypothesis is accepted. The results of chi-square test are presented in Table 3. Similarly, Cramer's V coefficient equals to 0.751. The critical statistic values at two 95% and 99% levels are extracted from Table 1, chi-square distribution probability values.

Table 4.3. Chi-square test results for the hypothesis 2

Indices of chi-square test		Difference	expected numbers	Observed numbers	duration of credits
63.496	X² statistic	-14.6	43.6	29	**Less than 1 year**
2	Degree of freedom	42.4	43.6	86	**Between 1 to 3 years**
0.000	margins of error	-27.6	43.6	16	**more than 3 years**
0.751	Cramer's V coefficient				
Test result: the null hypothesis has been rejected at both confidence levels, thus the research hypothesis is accepted.				131	**Total**
			X²$_{99\%,2}$	X²$_{95\%,2}$	**critical statistic at two levels**
			9.210	5.991	

Source:

Collegian Findings

Hypothesis 3: There is a significant relationship between the use cases of the offered credits and the creation of deferred debts.

Investigating the statistical population of this research revealed that deferred debts related to the working capital have been remarkably greater than the facilities for purchasing fixed assets. In this case, banks identify the most important procedures by which individuals and companies plan how to use their money in the working capital sector, and consider more control by specifying these factors and providing advice and practical solutions concurrent with lending facilities to these sectors. The chi-square (X2) test result is presented in Table 4.

As you can see in Table 4, the critical statistic for chi-square test at the 95% confidence level and with 2 degrees of freedom equals to 3.841 and at the 99% confidence level equals to 6.635. According to the calculations made, the value of 7.336 for chi-square test statistic has been observed. Since the calculated chi-square statistic is greater than the critical value at both levels, sample test function is located in the critical area at both 95% and 99% confidence levels, and this statement can be also observed in the SPSS output with Sig smaller than the error level of the test 0.05 and 0.01. As a result, the null hypothesis is rejected and the opposite hypothesis is accepted as the accurate hypothesis. The Cramer's V coefficient is also equal to 0.864.

Table 4.4. Chi-square test results for the hypothesis 3

Indices of chi-square test		Difference	expected numbers	Observed numbers	type of use
7.336	X² statistic	15.5	65.5	81	**working capital**
1	Degree of freedom	15.5-	65.5	50	**fixed capital**
0.000	margins of error			131	**Total**
0.864	Cramer's V coefficient				
Test result: the null hypothesis has been rejected at both confidence levels, thus the research hypothesis is accepted.			$_2$.X²$_{99\%}$	$_2$.X²$_{95\%}$	**critical statistic at two levels**
			6.635	3.841	

Source:Collegian Findings

Hypothesis 4: *There is a significant relationship between type of the payment credits (contracts/Oqood) and the creation of deferred debts.*

As you can see in Table 4, the critical statistic for chi-square test at the 95% confidence level and with 6 degrees of freedom equals to 12.592 and at the 99% confidence level equals to 16.812. According to the calculations made, the value of 58.214 for chi-square test statistic has been observed. Since the

*calculated chi-square statistic is greater than the critical value at both levels, sample test function is located in the critical area at both 95% and 99% confidence levels, and this statement can be also observed in the **SPSS** output with **Sig** smaller than the error level of the test 0.05 and 0.01. As a result, the null hypothesis is rejected and the opposite hypothesis is accepted as the accurate hypothesis.*

Table 4.5 Chi-square test results for the hypothesis 4

Indices of chi-square test		Difference	expected numbers	Observed numbers	type of credit
58.214	X^2 statistic	21.3	18.7	40	**Mudaraba**
6	Degree of freedom	-12.7	18.7	6	**Civil partnership**
0.000	margins of error	9.3	18.7	28	**installment sale**
0.968	Cramer's V coefficient				
critical statistic at two levels		-18.7	18.7	5	**Hire purchase**
12.592	$X^2_{95\%,6}$	8.3	18.7	2	**Jualah**
16.812	$X^2_{99\%,6}$	5.3	18.7	24	**Gharz-ol-Hasanah (beneficence loan)**
the null hypothesis has been rejected at both confidence levels, thus the research hypothesis is accepted.		-12.7	18.7	6	**Documentary credit**
				131	**Total**

Source: Collegian Findings

Hypothesis 5: *There is a significant relationship between type of the received collaterals and the creation of*

the creation of deferred debts.

X^2 test results in Table 5 show that the critical statistic for chi-square test at the 95% confidence level and with 7 degrees of freedom equals to 14.067 and at the 99% confidence level equals to 18.475. According to the calculations made, the value of 25.000 for chi-square test statistic has been observed. Since the calculated chi-square statistic is greater than the critical value with 4 degrees of freedom, sample test function is located in the critical area at both 95% and 99% confidence levels, and this statement can be also observed in the SPSS output with Sig smaller than the error level of the test 0.05 and 0.01, accordingly the null hypothesis is rejected and the opposite hypothesis is accepted as the accurate hypothesis.

Table 4.5 Chi-square test results for the hypothesis 5

Indices of chi-square test		Difference	expected numbers	Observed numbers	received collaterals
25.000	X² statistic	-6.75	32.75	26	Estate
7	Degree of freedom	-12.75	32.75	20	Promissory note
0.000	margins of error	24.25	32.75	57	enforceable contract
0.749	Cramer's V coefficient				
critical statistic at two levels		-4.75	32.75	28	deposits
14.067	X²₉₅%₇				
18.475	X²₉₉%,₇				
The null hypothesis has been rejected at both confidence levels, thus the research hypothesis is accepted.					
				131	**Total**

Source: Collegian Finding

Similarly, the statistical hypothesis testing was conducted for four districts including North, East, West, and South, just as it was done for the central district and the significance of the relationship between research hypotheses and deferred debts was determined and proved separately in each district by means of chi-square test, listed a summary of its results in the table below due to the limitation of this paper size.

5. *Test results of the research hypotheses and comparing with previous researches*

Test result	Comparison of ratios		Research hypotheses
	Research hypothesis $p_o \square \square p_e$	Null hypothesis $p_o \square \square p_e$	
Approved	✓	x	There is a relationship between type of economic activity and creation of deferred debts.
Approved	✓	x	There is a relationship between duration of the offered credits and the creation of deferred debts.
Approved	✓	x	There is a relationship between the type use of the offered credits and the creation of deferred debts.
Approved	✓	x	There is a relationship between type of payment credit and creation of deferred debts.
Approved	✓	x	There is a relationship between type of receivable collaterals and creation of deferred debts.

RESULTS

The central district of Rasht

According to Cramer's V coefficient obtained (0.968), type of payment credit exercised the greatest influence on the deferred debts in the west district. Therefore, hypothesis 4 had the most effect in the central district. [hypothesis 4: there is a significant relationship between type of the payment credits (contracts/Oqood) and creation of deferred debts].

Proposal: types of the credits paid to the clients include Mudaraba, Civil partnership, installment sale, hire purchase, Jualah, Qard-ol-Hasanah (beneficence loan), and documentary credit. It is recommended that bank managers should apply more controlling procedures in this sector and thereby identify the customers' uses and provide consulting services for other borrowers so as to prevent creating the deferred debts.

The role of marketing programs in choosing the right types of contracts (Oqood) payable to the customers is also noteworthy. Resource allocation, facility granting, interest earning, and charges arising from loans are considered as the most important ways to receive income for Iranian banks. As a result, banks are able to apply marketing techniques for choosing a customer and type of payment facility to sell their goods (facilities). Today there are customers who, due to the amount of their requirements, demand for a specific type of facilities by referring to the banks, while banks have to minimize the credit risk using direct marketing technique and validation of the customers who refer to the banks to receive some facility. In direct marketing, banks communicate with a customer without any intermediary and proceed to offer facilities by a mutual agreement after receiving the necessary information from the customer as well as validating and acquainting her/him with all kinds of payable contracts. Adopting such a procedure can help greatly in preventing and reducing the debts.

The north district

According to Cramer's V coefficient obtained (0.975), type of economic activity exercised the greatest influence on the deferred debts in the north district. Therefore, hypothesis 1 had the most effect in the north district. [hypothesis 1: there is a significant relationship between type of economic activity and creation of deferred debts].

Proposal: According to the studies conducted, most files of the deferred debts have been reported in the commerce and service sector that, on the basis of the results, indicated further impact of this sector on the deferred debts. Similarly, more accurate tests and examinations clearly specified that commerce and service sector with higher deferred debts had a greater effect on the BMI deferred debts. For this reason, new standard procedures need to be applied to grant facilities to the commerce and service sector; so as to control more at the facility-granting stages and to prevent the creation of more deferred debts in this sector.

Absence of marketing strategies for the facility granting in commerce and service sector is quite evident. In this sector, facilities are paid to customers mostly in the form of Mudaraba and documentary credit, being a kind of short-term loans, creating more relationship with the customer. To maintain and strengthen the relationship with merchants and service companies in today's competitive market, in addition to the above-mentioned direct marketing, is also possible by using relationship marketing strategy. The existence of such a relationship has an important role in the prevention of the deferred debts. Today every customer either as a depositor or as a debtor has her/his own special value. The main goal of relationship marketing is to create a stable and secure relationship with a customer of any kind. Creation of such a relationship with the customers who are the subjects of this study and have deferred installments is also very complex and has its own psychological subtlety. Technical and moral compliance with these subtleties in the bargaining process to collect installments is completely necessary.

The west district

According to Cramer's V coefficient obtained (0.955), type of credit use exercised the greatest influence on the deferred debts in the west district. Therefore, hypothesis 3 had the most effect in the west district. [hypothesis 3: there is a significant relationship between uses of the offered credit and creation of deferred debts].

Proposal: A survey on the statistical population of this research revealed that the deferred debts related to the working capital have been remarkably greater than the facilities for purchasing fixed assets. In this case, banks identify the most important procedures by which individuals and companies decide and plan for their own money in the working capital sector and consider more control over these sectors by specifying the related factors and providing advice and practical solutions concurrent with lending facilities. Direct marketing should be applied for identifying and specifying these factors so as to form a stronger control system by creating a more complete database from the use of the capital to prevent and reduce the deferred debts.

The east district

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According to Cramer's V coefficient obtained (0.896), duration of use exercised the greatest influence on the deferred debts in the east district. Therefore, hypothesis 2 had the most effect in the east district. [hypothesis 2: there is a significant relationship between duration of the offered credits and creation of deferred debts].

Proposal: the duration of the deferred debts, related to the facilities, with 1 to 2 years is longer than that of the deferred debts with a period less than 1 year and also with a period more than 3 years. According to the investigation conducted and the interview arranged with senior managers of the bank, it probably seems that most of the facilities were offered in the commerce and service sector and in the form of Mudaraba contracts and documentary credits, and facility receivers needed to settle their debts after selling the goods subject to each of the above contracts, and due to the remaining time until the maturity, they adopted to reinvest the above-mentioned capital into the other fields such as housing, leading to a delay in repayment of the received facility because of the necessity to stop the house construction at least for one year. In order to avoid this problem banks need to have more control and supervision on how to use the facility and timely payment of debts on behalf of their customers. The existence of such a monitoring depends on having a sustainable and effective relationship at the period of repayment, in which relationship marketing and type of behavior with a customer play a key role.

The southern district

According to Cramer's V coefficient obtained (0.975), type of the received collaterals exercised the greatest influence on the deferred debts in the southern district. Therefore, hypothesis 5 had the most effect on the deferred debts. [hypothesis 5: there is a significant relationship between type of the received collaterals and creation of deferred debts].

Proposal: The results showed that most of the collaterals received have been in relation to the enforceable contracts for the guarantee of the third parties. Then the deposits received are reported as the most number of collaterals. In order to reduce the debts, bank managers should use other collaterals, having greater capability for liquidity, and thereby proceed to cash the collaterals at the time of creating debts to collect part of them.

CONCLUSION

the results revealed that there is a significant relationship between type of economic activity, duration of payment credits, type of credit, type of collaterals received, and type of payment credit with deferred debts in all districts. Then the effect of each factor was separately studied in each of the five districts. And finally, the appropriate marketing strategies were designed and proposed in order to reduce deferred debts.

The following general proposals can also be submitted to solve the problem of deferred debts:

1. One of the most important points that banks need to consider in applying the marketing strategies in all districts to reduce debts is to use the conversion marketing and to change the negative demand into positive one. Banks can increase the tendency to the purchase of goods from the debt market, using creativity and innovation in the ways of lending facilities, collecting installments and presenting promotional advertisements such as remission of delay penalties, making installments of debts, indulgence (Imhaal), converting deferred facilities into current liabilities and so on.

2. Banks should completely describe marketing concept and its relationship with deferred debts in the banking system and also plan and arrange the proper marketing strategies and then implement them, monitoring the applied strategies and evaluating rate of their success in reducing debts with several methods such as direct marketing.

3. It is recommended for the statistical population organizations to employ the educated forces that are familiar with financial affairs to prepare reports on credit information in Credit Information office and Credit Department of the districts and avoid lending facilities to ineligible individuals by reviewing and amending of the existing directives and instructions. An instructions needs to be prepared and regulated to establish a responsibility for the appraisers of credit customers' estates, to receive vendible collaterals, to have a precise control, supervision and tracking of overdue accounts, to negotiate with debtors before the transfer of liabilities to the heading of the deferred debts, to control maturities and status of customer accounts in terms of liquidity, and to immediately investigate the installments deferred by a branch manager.

4. Banks also should set up educational courses to familiarize their employees and train them how to act in accordance with new methods of collecting installments and deferred debts, leading to a customer's convenience and saving his/her time.

5. Banks should train their personnel to identify unclaimed properties of debtors, to timely inform the guarantors in connection with the deferral of the facilities guaranteed, to choose the best legal system for collecting the debts and to avoid doing the parallel actions.

6. In addition, banks should not ignore the main role of employees' motivation in preventing and collecting the deferred debts. Finally, according to the results of this research and since the legal and financial methods employed by banks so far have little effect in reducing debts, that are still growing as the central bank declared, it is recommended that banks should not observe the deferred debts phenomenon only from financial management perspective. Nowadays, with the great advances occurred in the field of strategic and marketing management we can design, plan and implement the proper marketing strategies

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for reducing banks' deferred debts, with a broader and more innovative consideration and concurrently with today's technology.

CONFLICT OF INTEREST
There is no conflict of interest.

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ARTICLE

THE STUDY OF RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL COMPONENTS AND EFFECTIVENESS OF IN ISLAMIC AZAD UNIVERSITY OF AHVAZEDUCATIONAL PROGRAMS

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ABSTRACT

In this ultra-competitive age, the organizations face with an environment with some characteristics such as increase in complexity, globalization, and getting dynamic. In the knowledge economy, knowledge or intellectual capital as a factor of wealth production is more preferable in comparison with other tangible and physical capitals. In this economy, intellectual capitals especially human capital are regarded among the most important organizational capitals and the potential success of an organization rooted in its intellectual capabilities. This study aimed to investigate the relationship between the components of intellectual capital, including human capital, structural capital and relational capital with the educational effectiveness and they were studied in order to examine their potentials for the use of intellectual capital and accordingly six research questions have also been raised.

The statistical population consisted of two groups of faculty members and students of Islamic Azad University of Ahvaz including 52 faculty members and 3,500 students. Data collection was done by using two questionnaires; first educational effectiveness assessment questionnaire which was developed by the researcher and second intellectual capital questionnaire by Bontis (1998). Then, they were distributed among 221 students and 11 faculty members in Islamic Azad University of Ahvaz. The sample size was determined through Cochran formula that was used in a definite population. Thus, regarding 95% confidence level and the maximum relative error to 0.05, the sample size for students was obtained 221 and for faculty members it was 11. Sampling was done randomly and the results which were obtained by using correlation, regression and structural equation modeling showed no significant relationship between intellectual capital components together and between these components (except human capital) and educational effectiveness.

INTRODUCTION

Over the past 10 years, different economic, social and technological factors have been increasingly raised and they have changed the workplace. These changes happened so fast and they made so much competition that organizations like huge dinosaurs but with small brains grew in the twentieth century, while they cannot survive in the new world of the twenty-first century any more. Because of the nature of this age, the present organizations are completely different with the past ones. In the knowledge-based economy, intellectual capital is used to create value for the organization. Today, the success of any organization is related to the ability to manage these capitals. The future decade will attempt to value the intellectual capital for the organizations and countries. Therefore, regarding the intellectual capital in the global and regional level and since this issue is new, so it can be considered as an advantage for our country. Intellectual capital or intellectual property has been mentioned in the society, government, industry and academia levels and the accumulation of them makes the intellectual property of a country. In the national level, according to the priorities of the twenty-year vision, development of intellectual capital can help in the field of innovation, entrepreneurship, business development and the establishment of basic knowledge. Intellectual capital as a combination of intangible resources and defined activities allows an organization to transfer to a value making beneficiary and powerful system through a mass of human resources, finance and raw materials[1]. The experts define intellectual capital as what shows the intangible value of an organization. Intellectual capital is intellectual-knowledge materials, information, intellectual property and experience and the use of that can create the wealth (Stewart)[2]. According to the definition of Europe Commission intellectual capital is a combination of intangible resources and activities that enable an organization to change a set of human, financial and material resources to a system that is capable of creating value for shareholders[3,4] . Intellectual capital is a set of knowledge-based capitals that are specific to an organization and they are categorized in its characteristics and by adding value to key stakeholders of the organization, and they significantly improve the competitive position of the organization [5] Intellectual capital includes several components or dimensions. Bontis stated three types of capitals including human capital, structural capital and customer capital and in 2000 he changed his classification into human capital, structural capital, relational capital and intellectual capitals or property Chen et.al. (...) believed that intellectual capital has four elements; 1 human capital, 2. customer capital, 3 innovation capital and 4. structural capital. They believed that the structure and components of intellectual capital are very weak and fragile unless they are supported by a series of continuous and interconnected relations. In fact, they emphasized on the relationship between intellectual capital components rather than its components. It is concluded that when in the literature of study, the intellectual capital is examined, it seems that most of intellectual capital models regard three human, relational and structural aspects with some common features for intellectual capital. [5] Human capital means a level of personal capital, and a level of individual knowledge that the employees working in an organization possess and this knowledge is normally implicit. Mayo defined human capital as something that consists of ability, knowledge, skills, experience and working network with the ability to achieve potential results and growth, motivation in terms of ambition, working motivation, efficiency, effectiveness of teamwork in support and assistance, mutual respect, leadership in transparent vision and ability to communicate and announced that vision, organizational climate in terms of culture (especially innovation freedom, , openness, flexibility, and respect to individuals). In academia level, human capital is a set of

explicit and implicit knowledge of manpower in universities (professors, researchers, PhD students and administrative staff, etc.) which are achieved through formal or informal educational and practical processes and embodied in their activities. The structural capital means all non-human capitals or organizational capabilities. Structural capital is defined as the total capitals which have the ability to make the creativity of an organization possible[6]. Mission, vision, basic values, business strategies and systems and internal processes within an organization can be counted among these types of capitals Structural capital can be referred to anything exists in the organization and it supports employees (human capital) in their work. Structural capital is owned by the organizations and even when employees leave the organization, it can be seen in the organization) [7]. Structural capital of the university remains within the organization after the withdrawal of the employees from the organization and it includes all non-human resources of knowledge. Structural capital in university covers all supportive infrastructures to strengthen the university human capital. Thus, administrative rules and practices, organizational procedures and levels, cultural systems, databases and intellectual property are especially important. The relational capital means all learned knowledge from an organization relationship with its environment, including customers, suppliers, scientific associations and so on. According to Chen, the most important part of a relational capital is the customer capital since the organization success depends on the customer capital. In general, the customer capital that acts as a bridge and intermediate in intellectual capital process is the main determining factor in the transformation of intellectual capital to the market value and consequently it is the business function in the organization In the academia level, the relational capital is a set of implicit and explicit knowledge which are related to the practices and the ways in which universities can interact with other institutions and social organizations, such as the exchange letters, memorandum of understanding or contracts for research and etc. Relational capital is to create the relationship between the university and its unscientific partners such as companies, nonprofit organizations, public authorities, the government and generally the society. In fact, it is the university relational capital to achieve a broad set of continuous and developed economic, political and organizational relationships. Higher education is the core of sustainable development of any country and the university as a scientific, educational and research reference plays a legitimate role in the process of sustainable development in the global, national and local communities. If human is the heart of sustainable development, the university can make a generator of knowledge and skills appropriate with different educational levels. In this era when knowledge is associated with it, the university is the most important institution of higher education which makes some challenges. While one of the traditional functions of university is to make knowledge, certainly the advent of the knowledge-creation companies to universities will be accompanied by some challenges. Regarding the importance of higher education institutions, especially universities in today society, universities are experiencing some profound crisis as Peter Drucker the scholar in management science warned that in thirty years, the major universities will be as a memorial and the higher education remains in a deep crisis. The environment is changing and facing with globalization and the advent of advanced communication of relationship and information are major challenges that universities are confronted with. As it was previously mentioned, growth and rapid development of knowledge have drastically changed the educational system, because it allows the faster and more affordable transfer of data (the amount of knowledge doubles every 5 years)[8]. Also, if in these situations the traditional universities do not coordinate with the phenomenon of globalization and don't consider the impact of new technologies on the diffusion of knowledge, it will become the end of their lives. Today the survival and life of the organizations in present knowledge-based community requires intellectual capital in the university. Universities must take a leadership role in the creation and development of intellectual capital because basically the main task of universities is knowledge-creation. Optimal utilization of the information available at the University at a time when universities are facing with massive amounts of diverse data is an important issue. Does intellectual capital management to implement mechanisms of intellectual capital management in organizations require to turn them into economic capital in the university? According to the meaning of university some people might believe that university is a place to get knowledge which is implicit in its meaning and it covers intellectual capital management. But in order to have effective education, the universities require management of intellectual capital. In our country, some foundation were designed to develop knowledge-based economy for the first time in the economic, social and cultural development programs and knowledge-based development was considered as a key strategy to achieve sustainable development in this program from 2006 to 2009. However, the main question that has been raised is that when in the economical social and cultural development program in our country, knowledge has been mentioned as a basic strategy, how much some organizations especially universities where have been regarded as the place of producing knowledge rely on knowledge? Do universities have the essential organizational contexts in order to develop and train the knowledge-based economy? Thus, evaluation of contexts and infrastructures in order to apply a new system, particularly with regard to social nature and complexity of intellectual organizations is very important. Using the models related to new approaches of intellectual capital management regardless of the availability of the contexts and examining their strengths and weaknesses are often faced with failure and ruin the effectiveness of educational programs. Since recently, networks and formal and informal modes of production and distribution of knowledge have been presented, universities pay attention to various aspects of intellectual capital in order to achieve their goals.

Since the main purpose of universities is effectiveness of educational programs, the present study attempts to investigate if there is any significant relationship between intellectual capital present in universities and the effectiveness of their educational programs. In fact, by determining the effectiveness of educational programs it can be judged that the achievement of goals in universities is desirable and it is important to know how much it should be improved[9].

Recently, many studies have been done on the relationship between intellectual capital with factors such as knowledge management, organizational culture, organizational learning and etc. in Iran. However, no study have been done on the role of intellectual capital on effectiveness of curriculum. Most of the studies have measured the intellectual capital management at the level of international organizations and institutions. Bontis et al. in the service and non-service industries in Malaysia have done a study titled "The relationship between intellectual capital and business performance" and they concluded that there is a mutual relationship between the components of intellectual capital and they fairly affect the business function about 20 to 30 percent. In order to provide a framework to measure intangible capitals in higher education and research institutions in Italy, Schando et.al.investigated existing theories and practical experiences of the fundamental conceptual model by combining measurement indicators of intellectual capital and he found that the development of intangible capitals is done by focusing on the mission of educational and research organizations. Thus, identification and measurement of intellectual capital is an operational priority in assessing the alignment between the strategic direction and performance within such institutions. The supposed comprehensive set of indicators can be useful to refine them in order to make a relationship between strategy and management subjects and indicators. On the other hand, it is the practical application that the indicators set can be used as a communication tool and support the strategic decisions related to structural, human and social capitals and educational and research organizations

In Iran some studies were conducted to examine the intellectual capital which often belongs to economic and non-scientific organizations. Sattari Ghahfarkhi conducted a study which was done by using descriptive and correlation methods to predict organizational intelligence based on intellectual capital component among the faculty members and university administrative employees in Mazandaran PayamNour University. He found that the relationship between the organizational intelligence and intellectual capital is relatively strong and it is about 54%. The findings of this study are consistent with Jong theoretical framework in which intellectual capital has been considered as an element of organizational intelligence. The findings of the fifth hypothesis based on stepwise regression showed that all components of intellectual capital are significantly able to predict organizational intelligence and in fact these findings introduce the components which can improve organizational intelligence. This means that organizations invest in any of the three components of intellectual capital (human capital, structural capital and relational capital) and they can expect decrease in collective idleness and increase in organizational intelligence[10].

Conceptual model of the research
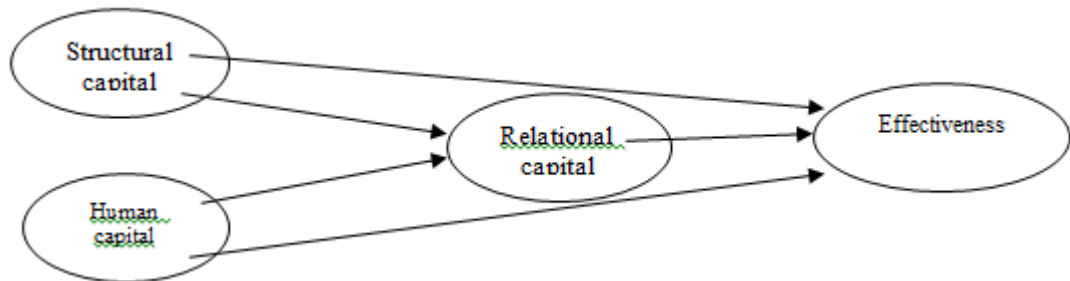
Research objectives
1. To explain the relationship between the components of the human capital (intellectual property) and the effectiveness of educational programs in Islamic Azad University of Ahvaz
2. To explain the relationship between the components of the social capital (intellectual property) and the effectiveness of educational programs in Islamic Azad University of Ahvaz

3. To explain the relationship between the components of the structural capital (intellectual property) and the effectiveness of educational programs in Islamic Azad University of Ahvaz
4. To present strategies and suggestions in order to improve the effectiveness of intellectual capital level of educational courses in Islamic Azad University of Ahvaz

Research hypotheses
1. Components of intellectual capital are significantly and positively correlated with the effectiveness of educational programs in Islamic Azad University of Ahvaz.
2. Components of human capital (of intellectual capital) are significantly and positively correlated with the effectiveness of educational programs in Islamic Azad University of Ahvaz.
3. Components of social capital (of intellectual capital) are significantly and positively correlated with the effectiveness of educational programs in Islamic Azad University of Ahvaz.
4. Components of structural capital (of intellectual capital) are significantly and positively correlated with the effectiveness of educational programs in Islamic Azad University of Ahvaz.

RESULTS

The research method was descriptive and a survey. The statistical population consisted of two groups of faculty members and students of Islamic Azad University of Ahvaz including 52 faculty members and 3,500 students. Data collection was done by using two questionnaires; first effectiveness assessment questionnaire which was developed by the researcher and second was intellectual capital questionnaire by Bontis and they were distributed among 221 students and 11 faculty members in Islamic Azad University of Ahvaz. The sample size was determined through Cochran formula that was used in a definite population. Thus, regarding 95% confidence interval and the maximum relative error to 0.05, the sample size for students was obtained 221 and for faculty members it was 11. Data analysis was done by using descriptive statistics (frequency, percentage, mean, standard deviation for components and questions in the questionnaire) and regression analysis to test hypothesis of the relationship between intellectual capital components and educational effectiveness (SPSS.19 was used). Then, the structural equations modeling: SEM was used for confirmatory factor analysis and analysis of the relationship between intellectual capital components and effectiveness of educational program was analyzed based on conceptual model of the study.

Background information of the students and faculty members: The statistical distribution of variables such as gender, education, age, educational group and scientific rank.

Table: 1. Distribution of frequency percentage of students' gender

Gender	Frequency	Valid percentage	cumulative percentage
Female	78	36.8	36.8
Male	134	60.6	100
Total	212	100	-

Table: 2. Distribution of frequency percentage of students' education

Education	Frequency	Valid percentage	cumulative percentage
Bachelor	131	78	92.3
Master	24	14.3	0
PhD	13	7.7	100
Total	168	100	-

Table: 3. Distribution of frequency percentage of students' educational group

Educational group	Frequency	Valid percentage	cumulative percentage
Literature	98	48.8	48.8
Basic sciences	24	11.9	60.7
Technical	76	37.8	98.5
Agriculture	3	1.5	100
Total	201	100	-

Table: 4. Distribution of frequency percentage of professors' gender

Gender	Frequency	Valid percentage	cumulative percentage
Female	4	44.4	44.4
Male	5	55.6	100
Total	9	100	-

Table: 5. Distribution of frequency percentage of professors' scientific rank

Education	Frequency	Valid percentage	cumulative percentage
Lecturer	6	66.7	66.7
Assistant professor	-	-	100
Associate professor	-	-	-
Master	3	33.3	-
Total	9	100	-

Table: 6. Distribution of frequency percentage of the professors' educational group

Educational group	Frequency	Valid percentage	cumulative percentage
Literature	5	45.5	71.4
Basic sciences	2	18.2	100
Technical	-	-	-
Agriculture	-	-	-
Total	7	100	-

Research instrument

In this study, two types of questionnaires were used. Inventory dimensions of intellectual capital in higher education by Bontis (1998) have been used and it was designed, validated and applied earlier. The questionnaire contained 53 questions, and it measured the components of human capital, structural capital and relational capital. The educational effectiveness measurement questionnaire in first level of KorkPatric model was designed by the researcher and according to the supervisor's experiences and some valid resources, it evaluates the effectiveness of educational programs in the Likert scale with five options. The questionnaire contained 37 questions. Both questionnaires have been introduced following:
A. Questionnaire of intellectual capital in higher education. The components of this questionnaire with the number of questions related to each component were presented in the table below. An example of the

questionnaire has been presented in Appendices.

Table:7. Components and relationships between questions of the intellectual capital questionnaire and its statements

Title of components	Number of item
Human capital	1-20
Relational capital	21-37
Structural capital	38-53

B. The educational effectiveness measurement questionnaire in first level of KorkPatric model was designed by the researcher. The statement and number of them have been stated in the following table.

Table: 8. Components and relationships between the statements of the question naire of evaluating the effectiveness of educational programs with its items

Title of components	Number of item
Lesson features	1-9
Content features	10-16
Professor features	17-24
Management features	25-29
Possibilities features	30-37

Validity and reliability assessment of the questionnaire

In this study, to assess the reliability of the questionnaire, Cranach's alpha was used. The results obtained from Cronbach's alpha analysis to assess reliability were analyzed by SPSS.19 for all components of both questionnaires which have been presented in the table below.

Table: 9. The reliability coefficients of the questionnaire components of intellectual capital in higher education based on Cronbach's alpha

Components	Cronbach's alpha	Cronbach's alpha (Babazadeh)	Number of the statement questions	Considerations
Human capital	84%	88%	20	Proper reliability
Relational capital	77%	80%	17	Proper reliability
Structural capital	80%	79%	16	Proper reliability

Table: 10. Reliability coefficients of main component of the educational effectiveness questionnaire based on Cronbach's alpha

Component	Cronbach's alpha	Number of the statement questions	Considerations
Lesson features	67%	9	By deleting question 6 of this component alpha reached to 0.705
Content features	82%	7	Proper reliability
Professor features	58%	8	By deleting question 1 and 2 of this component alpha reached to 0.71
Management features	82%	5	Proper reliability
Possibility features	64%	8	By deleting question 4 of this component alpha reached to 0.69

These figures show that the reliability of the components of intellectual capital questionnaire used in the study has a good reliability. Although reliability in this study is mostly lower when it is compared with Bontis (1998) study, the general reliability is proper.

The researcher made questionnaire on educational effectiveness for two components of content features and management features showed also a good reliability. However, for the lesson features, the sixth question should be deleted, and in professor features; question 1 and 2 and in possibilities features; question 4 should be deleted to achieve an acceptable and proper reliability. So in chapter four, an analysis has been done after deleting the mentioned questions. The lack of reliability of the questions mentioned above, perhaps shows lack of clarity or intelligibility of the question for students and faculty members. So as it was mentioned, subsequent analysis can be done by removing the mentioned questions from the questionnaire.

Assessment of validity of the questionnaire: The validity in this research has been done in two ways. Content validity (formal) and construct validity.

To measure the content validity of the questionnaire in case of intellectual capital questionnaire in higher education, the results of Bontis (1998) study were satisfactory. In case of educational effectiveness questionnaire the following steps were followed :
1. Designing a questionnaire based on theoretical model and research literature.
2. Showing the questionnaire to the supervisor and consultant to study the preliminary questions and give opinion
3. Using other professors' opinions and their views and actions were investigated and applied under the guidance of the supervisor

Another way to check the validity of components and the questions in the questionnaire was construct validity which is one method of assessing the validity of the questions and components of the questionnaire through factor analysis which is done in two ways; exploratory and confirmatory factor analysis.

Table: 11. The results of exploratory factor analysis for fit criteria of the intellectual capital questionnaire to

Fitting criteria Factors	KMO	Bartlet significance test	Variance	Number of extracted factors
Human capital	0.737	0.022	20.3	1
Relational capital	0.853	0.010	18.5	1
Structural capital	0.890	0.018	14.7	1
Total percentage	--	--	53.5	--

Table: 12. The results of factor analysis for fit criteria of the educational effectiveness questionnaire to assess the validity of components

Fitting criteria Factors	KMO	Bartlet significance test	Variance	Number of extracted factors
Lesson features	0.799	0.013	15.8	1
Content features	0.805	0.025	12.4	1
Professor features	0.720	0.011	11.7	1
Management features	0.889	0.032	10.9	1
Possibilities features	0.665	0.047	10.04	1
Total percentage	--	--	60.84	--

In **Table- 11**, the value of KMO and Bartlett's test show that the number of samples used in the study is sufficient to run a factor analysis of all components because KMO coefficient for all of them is higher than 0.6.Besides, the significance value of Bartlett's test for all factors was lower than 0.05which shows the extracted factors by factor analysis are significant. Thus, the questions of each component (as a whole) could explain the mentioned component. In other word, these questions are valid to make the desired component (validity). (It should be noted that the fourth column (share percentage) Bartlett test are kind of validity coefficient test for the questions). In addition to the abovementioned, in general it can be said that these three components together explain 53.5% of the whole variance of intellectual capital. Besides, in case of the educational effectiveness questionnaire, KMO and Bartlett's test show that the number of samples used in the study is sufficient to run a factor analysis of all components because KMO coefficient for all of them is higher than 0.6.Besides, the significance value of Bartlett's test for all factors was lower than 0.05which shows the extracted factors by factor analysis are significant. Thus, the questions of each component (as a whole) could explain the mentioned component. In other word, these questions are valid to make the desired component (validity). (It should be noted that the fourth column (share percentage) Bartlett test are kind of validity coefficient test for the questions). In addition to the abovementioned, in general it can be said that these five components together explain 60.84% of the whole variance of educational effectiveness.

Findings

Table: 13. The mean and standard deviation of the components of intellectual capital and educational effectiveness in the total sample

Statistics Component	Number of samples	Mean	SD
Educational effectiveness	232	3.26	0.77
Human capital	232	3.01	0.59
Relational capital	232	2.97	0.55
Structural capital	232	2.97	0.54

As it can be seen in the above table, descriptively mean of one component of intellectual capital (human capital) and educational effectiveness are positively different with the average amount (3 value), and the truth (or so-called significance) of the difference must be tested. And other components of intellectual capital (relational capital and structural capital) are not positively different with the average amount (3 value).

First hypothesis: The components of intellectual capital (human, relational and structural capital) have a significant relationship with the effectiveness of educational programs in Islamic Azad University of Ahvaz.

Table: 14. The results of t - a single model for intellectual capital component and educational effectiveness status in Islamic Azad University of Ahvaz

Test values Component	T statistics value	Degree of freedom	Significance level
Educational effectiveness	5.16	231	0.00
Human capital	0.44	231	0.66
Relational capital	-0.59	231	0.55
Structural capital	-0.71	231	0.47

As it can be seen in the above table, the significance value of the three components of intellectual capital is higher than 0.05 (0.000 means the fourth decimal gets rounded and to three decimal places is zero). Thus, for all three components, the null hypothesis was confirmed and therefore in reality (non-random) the mean of educational effectiveness status of all components of intellectual capital in the population is lower than 3 (lower than average). Therefore, just the component of educational effectiveness is lower than 0.05, and so H1 is confirmed. Based on the results, to answer the subsidiary hypothesis among the general one, the following are summarized:

Hypothesis (2 to 4): Components of human capital, structural capital and relational capital by professors have a positive significant relationship with the educational effectiveness in Islamic Azad University of Ahvaz.

Table: 15. Regression coefficients of the relationship between intellectual capital and educational effectiveness in Islamic Azad University of Ahvaz

Predictors	Non-standard Beta coefficient	standard Beta coefficient	T value	Significance value
Fixed value	65.30	--	5.61	0.000
Human capital	0.59	0.24	2.44	0.015
Relational capital	-0.08	0.30	-0.27	0.785
Structural capital	0.48	0.29	0.14	0.097

Table- 16 shows that the components of human capital has a significant positive relationship at the level of 99% with the educational effectiveness in Islamic Azad University of Ahvaz, and it can be a significant predictor for the effectiveness of education. Other components (relational capital and structural capital) at 95 percent have a significant positive relationship with the educational effectiveness in Islamic Azad University of Ahvaz and they can be a significant predictor for the educational effectiveness.
Analysis of the structural part of the model based on structural equation: the final result of the structural model of research has been presented in the following figure;
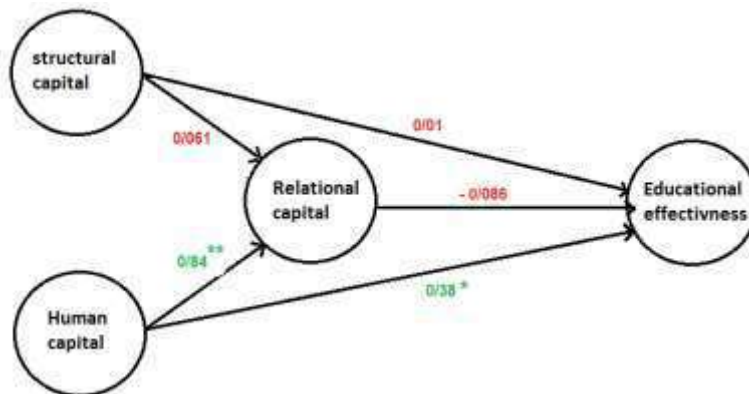
As it can be seen, the relationship between human capital and educational effectiveness was significant at 95% confidence level. Other relationships between intellectual capital components and educational effectiveness were not significant. Besides, the relationship between human capital with another components of intellectual capital (ie, relational capital) was significant.

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ARTICLE

EXPRESSING THE RELATIONSHIP BETWEEN ORGANIZATIONAL LEARNING AND JOB ENGAGEMENT WITH THE MEDIATING ROLE OF EMPLOYEES' READINESS FOR CHANGE (CASE STUDY: EMPLOYEES OF TEHRAN CUSTOMS)

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ABSTRACT

Background: The present research aims to investigate the relationship between organizational learning and job engagement with the mediating role of employees' readiness for change.. Methods: The statistical population in the present research includes 230 of the employees of Tehran's Customs organization. The sampling method of the present research is a simple random method and by using Cochran's formula, the sample volume is equal to 144 persons. The data necessary for the present research has been collected by using a questionnaire, the validity of which was tested. In order to determine the validity and reliability of the questionnaires, content validity and Cronbach's alpha coefficient were used and the reliability coefficient for the organizational learning questionnaire was calculated to be 0.88, 0.86 for the job engagement questionnaire and 0.87 for the readiness for change questionnaire. In this study, the structural relationship model was used to analyze the data. In order to analyze the data and to test the hypotheses and other analyses of this study, the statistical software LISREL was used. Results: In general, the results showed that there is a significant relationship between organizational learning, job engagement and employees readiness for change.

INTRODUCTION

In the 21st century, organizations face change constantly. In order for us to reinforce them to effectively compete in the competitive markets, the key point is for them to know how to learn and produce new knowledge. Organizational learning is a determining factor in the long term performance and survival of the organization [1]. and it is an effective factor for organizational success and a source for achieving competitive advantage [2]. A successful organization in the evolving and complex world of this century is an organization that can direct the process of learning and acquiring knowledge by using data technology mechanisms towards group and collective knowledge and create a substrate and a space in which the employees share their subjective knowledge which is the result of their own personal experience and savings and those that can try to create a new competitive advantage and ultimately wealth by developing and integrating them. The need of the organizations for compatibility with environmental changes has made the concept of organizational learning very important and its importance is increasing daily [3]. Studies show that the more it is added to people's organizational learning ability, the more an organization can adapt to the changing environment. Therefore, survival and growth of the organizations in the current world which is full of change require the ability for an on time and proper reaction to the successive environmental changes and only the organizations that focus and put emphasis on organizational learning can predict environmental changes and necessities on time and continue their survival in the changing environment. Therefore, one of the undeniable necessities for being successful in making these changes is the presence of readiness for change in the organization. The concept of readiness for change comply with the thoughts of Levine about exiting the state of being frozen and it is indicative of the individual approaches which occur during a process of change[4]. Individuals are important factors in guiding the process of organizational change and are essential for each effective change. Beliefs, ideas, assumptions and approaches of the individuals are challenged and clarified. Creation of a continuous change inside the organizations requires a change in the individuals of an organization which forms the basic axis of each job system. On the other hand, organizations, in order for the survival of the knowledge-oriented, valuable and talented employees, shall pay a special attention to another important and positive component that is job engagement. Job engagement is considered as an important and positive component in the health of the employees. The important issue of the progression of the organizations is how they increase the levels of engagement of their employees. By creating job engagement, a kind of unity and cohesion is created between the employees of the organization which means reaching results that are desirable for the person and the organization. These results for the employees are: positive approaches associated with job, probability of lower burnout, desirable performance, acquiring job resources and individual resources especially self-sufficiency and all of these results are directly or indirectly of advantage for their organization as well [5]. Therefore, the purpose of the present research is to express the relationship between organizational learning and job engagement with the mediating role of employees' readiness for change.

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RESEARCH'S LITRATURE

Organizational learning

It seems that the word "organizational learning" has been used in 1963 for the first time by March in their preliminary study on behavioral aspects of organizational decision making [6]. But some believe that the attention university assemblies pay to how the organizations learn is traced back to 1950 [7]. Regardless of the exact date of the beginning of the organizational learning discussion, this issue was not focused on much until late 1970s. that was when a number of theorists focused their activities on organizational learning [8]. Although research activities on this issue continued in the 1980s, in 1990s the issue of organizational learning was only one of the prominent issues in various areas of management studies such as production management and strategy and from that date forward, the discussion of organizational learning was overshadowed by new management issues including the issue of learning organizations. Given the definitions above, it can be said that organizational learning is not a fixed condition or a limited goal but it is a continuous process of adaptation with the environmental condition and evolution during which the groups inside an organization are encouraged so that the skills, knowledge and work regarding the target would be developed [7]. Argyris and Schon (1978) have divided the learning process into three categories single-loop learning, double-loop learning and deutero-learning. In the opinion of Figueiredo (2002), learning in the organizations has four secondary processes of acquiring knowledge outside of the organization, inside of the organization, knowledge generalization and encryption and development of knowledge. Choe (2004) refers that the main facilitators of organizational learning are interaction and communication between group members, job rotation and experience, interaction and communication including state, direction and frequency of the current of the information between the group members and job group and experience refers to the capacity of real exchange of the work between the members [9]. Some of the researchers put emphasis on the point that organizational learning is the main component of the learning organization and in order to do it, the factors associated with organizational culture such as entrepreneurship, innovation and awareness of the market and factors associated with organizational atmosphere such as dynamic structure, facilitator leadership, unfocused strategic planning and presence of knowledge-oriented human force seem necessary [10]. Also the results of previous studies have shown that presence of knowledge and information has a positive effect on organizational learning [9]. The term organizational learning apparently refers to individual learning in the organization but organizational learning mostly refers to group learning or learning at a level of the organization. Individual learning is done through studying, interview, recognition, experiencing, exercising and developing the effective mental models in mind; but organizational learning occurs when a group learns to interact, share knowledge and act as a group in such a way that the combined capacity of the group will grow and they will achieve the ability of perception and doing effective work [11]. In today's varying and competitive world, the organizations can continue surviving or claim to be superior so that they would be able to exploit the capabilities, commitment and capacity of learning of the individuals at all organizational levels and in other words, be a learning organization [12].

Job engagement

In most studies job engagement is introduced as an instance of positive aspects of work and today the owners of organizations expect their employees to be very active and show creativity in their work and be responsible for their responsible improvement and try to do their tasks with high quality. Therefore, they need employees who feel loyal and energetic and are attracted to their work which means that they are engaged with their works [13]. Job engagement, as one of the dimensions of well-being in the work environment, is indicative of a active and positive feelings which is known as a high level of work with interest and pride and in other words, it is associated with a progressive and humanistic psychological purpose [14]. Engaged employees become one completely and consider the organization their identity and consider the failure or success of the organization as their own. They are not angered when it comes to doing their work but they take a step towards doing impossible things and reinforce each other at times of difficulty and crisis to use their power one more time [15]. In the recent years, job engagement has attracted special kind of attention. Job engagement is important because job is considered as an inclusive and effective component of welfare which not only affects people's quality of life but their mental and physical health as well. Most people have to work to make a living which makes working an obligation rather than a choice. Nonetheless, despite the lack of this apparent choice, people's experiences regarding the work are very different and work has been considered as a repeated and homogenous process and even a manifestation of individual identity [16]. Today's organizations need energetic and engaged employees who are very interested in their jobs. Generally, engaged employees are completely drawn to their jobs and do their tasks desirably [17].

Readiness for change

The purpose of organizational change is to become compatible with the environment and to improve the performance [18]. Madison, et al. (2006) observed that change at the level of organization cannot be completed without people and people don't change unless they are ready for it. Robert (2008) and Fredrick Nicoles define change as: a thing which is moved from one place to another (movement from a problematic situation to a problem solving situation). As Romanly and Tashman (1994) have stated, change happens in 5 domains of the activity of the organization: organizational culture, strategy, strategy

through main competitive, technological and social changes I the environment [19]. Numerous factors can play a role in the success or lack of success in the implementation of the planned changes. One of the most important of these factors plays a critical role in executing the change process is the employees' approach to change [20]. Thus, this factor is seen as basic factor in the literature of readiness for change. Approaches are the value judgements of people which are obtained from various types of information which vary in terms of quality (emotional and cognitive). In the opinion of Armenakis, et al. (1993) approach to change refers to belief and tendency of the employees to change [21]. Employees must believe that the organization needs to change and that they can take the responsibility of making these changes positively. Readiness for change has been studied as the most common positive approach to change. In other words, employees' readiness can be considered as the best manifestation of their positive approach to change. Approximately 90% of the literature of approach to change ends with readiness for change by resisting it [22]. The term readiness is used both against behaviors resisting change and behaviors supporting it [21]. It is obvious that people's responses to change are different; some consider it a useful factor and consider it valuable and support it; whereas some others consider it a threat and resist it with negative reactions ([23]. Paige, et al. (2005) have believed readiness for change as the extent to which employees have a positive approach to and view of change and also the extent to which the employees believe that such change probably has positive consequences for them and for the organization [24]. Huy (1999) defines readiness for change as the extent to which a person is ready to do organizational activities [25]. Readiness occurs when the environment, structure and approach of the members of the organization are in such a way that they accept the change happening soon [26]. Dunham, et al. (1989) have defined their views about readiness for change as follows: their view generally includes person's recognition regarding change, emotional reactions to change and behavioral tendencies to change. Cognitive reaction to change shows the extent to which that person perceives the occurrence of change and its goal in making profits for the organization and its members. Emotional reaction to change shows the extent to which the person enjoys change in the organization. Behavioral tendency to change is the extent to which the person makes efforts to support change or start it [27].
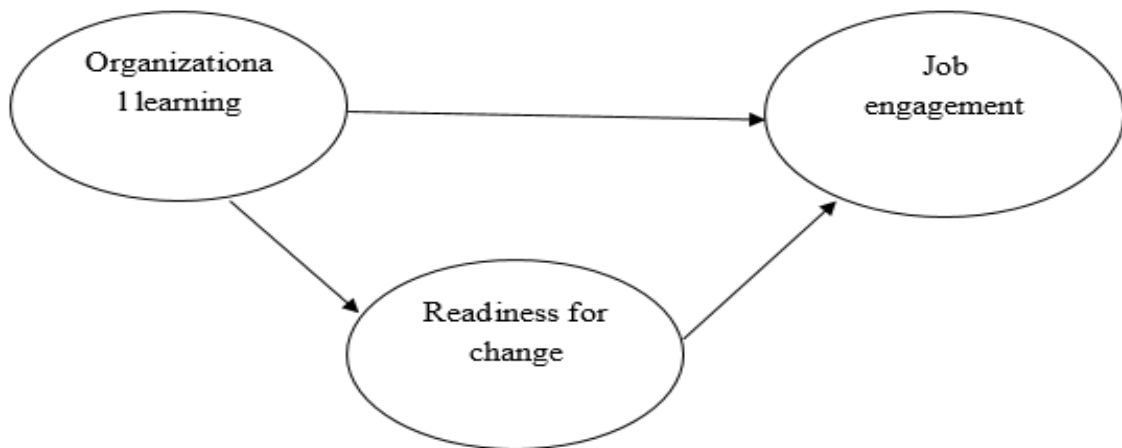

Fig. 1: conceptual model

Research's hypotheses

1-There is a significant relationship between organizational learning and readiness for change.
2-There is a significant relationship between readiness for change and job engagement.
3-There is a significant relationship between organizational learning and job engagement.
4-There is a significant relationship between organizational learning and job engagement with the mediation of readiness for change.

MATERIALS AND METHODS

The data required for the present research has been collected through using a questionnaire the validity of which was tested. The researcher has used a questionnaire with 32 questions all of which are questions with a 5-option Likert spectrum to collect data. This data has been analyzed by the LISREL software. The statistical population in the present research includes 230 of the employees of Tehran's Customs. The sampling method of the present research is a simple random method and the sample volume was calculated to be equal to 140 persons by using the Cochran's formula. The data required for the present research has been collected through using a questionnaire the validity of which was tested. In order to determine the validity of the questionnaires the content validity and Cronbach's alpha coefficient were used and the reliability coefficient for the Gomez, et al. (2005) organizational learning questionnaire was calculated to be 0.88, it was 0.86 for Shofley, et al. (2006) job engagement questionnaire and 0.87 for the readiness for Dunham, et al. (1989) change questionnaire. In the present study, after drawing the analytical model of the research based on the data, through Path diagram program the measurement model was obtained by running the Perlis program of the LISREL software. In this model, by using B coefficients and by using a t-test the hypotheses were tested. In addition, the fitting indexes of the model were calculated by running the Perlis program for the required model.

Data analysis

Table 1: Fitness indicators of research's model

Fitting index	Standard values	Estimated values
Degrees of freedom	----	432
Chi-Square	Due to the dependency on the sample volume, this is not a suitable criterion	1142.70
RMSEA	0.05	0.091
NFI	0.90	0.90
NNFI	0.90	0.95
CFI	0.90	0.96
RMR	0.05	0.057
GFI	0.90	0.75
AGFI	0.90	0.71

As it is seen in [table 1], the indexes of the rate of compliance of the goodness of the fitting are relatively acceptable.

Testing the structural model

In this study, the confirmatory factor analysis method was used for testing the measurement model and path analysis for drawing the structural model of research. The two following graphs show the overall models which are the output of the LISREL software which simultaneously includes the structural model and the measurement model and as the study goes on, we will separate them in details and we will review them.
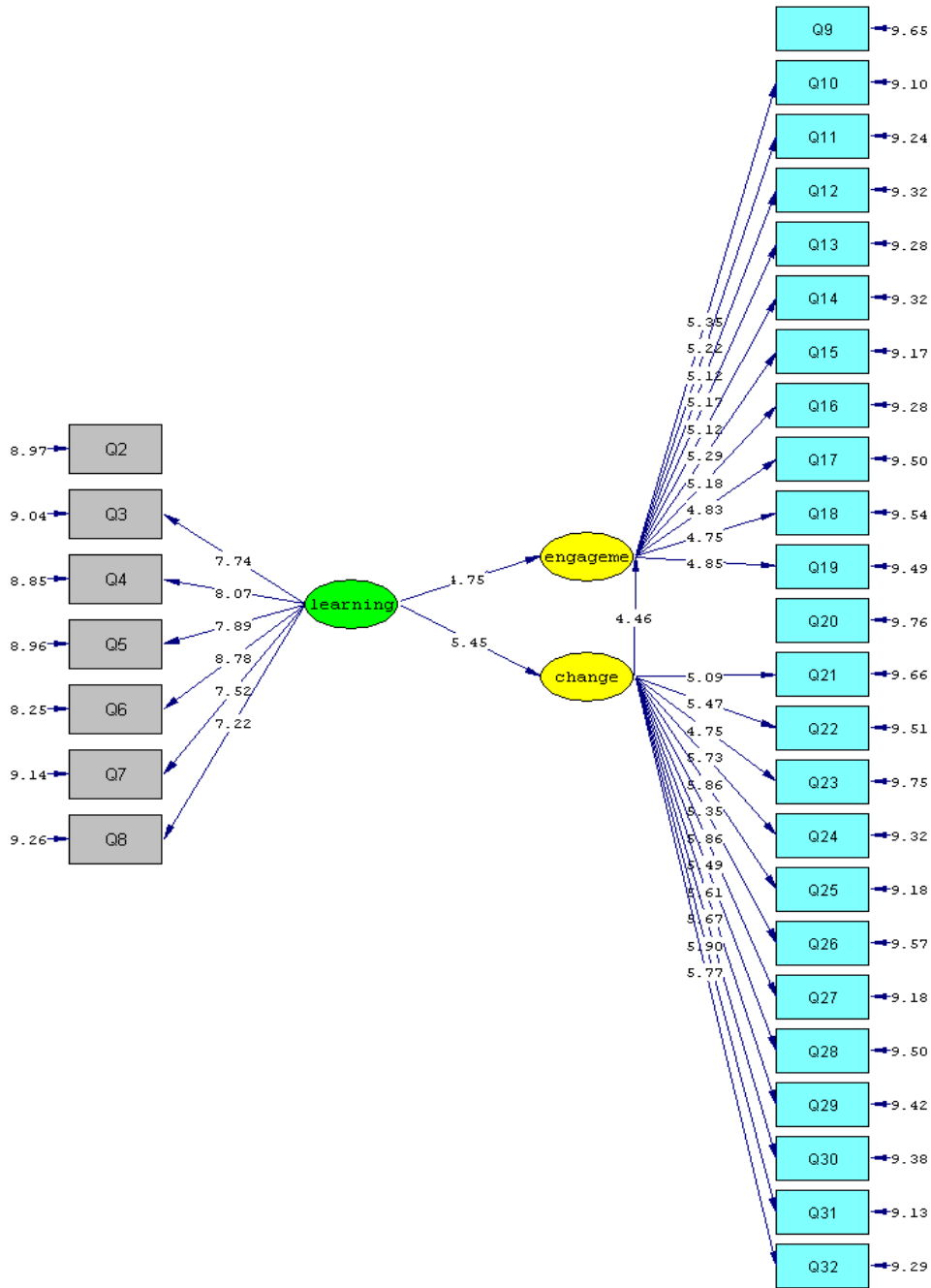
Chi-Square=1142.70, df=432, P-value=0.00000, RMSEA=0.091

Fig. 2: Base model with T value

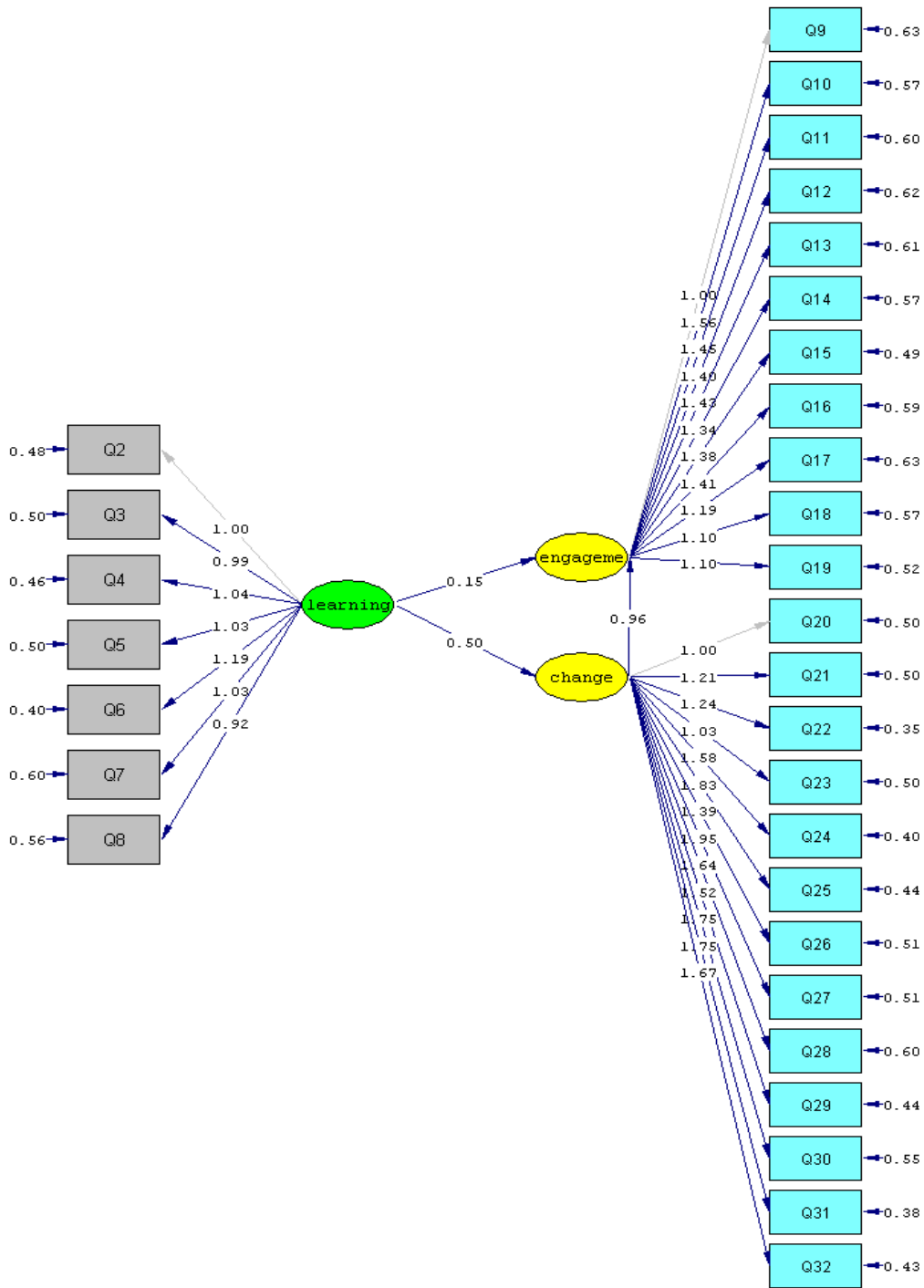Chi-Square=1142.70, df=432, P-value=0.00000, RMSEA=0.091

Fig. 3: Base model with rout coefficient

RESULTS

The first hypothesis: there is a significant relationship between organizational learning and readiness for change.

Table 2: the results of first hypothesis's test

Hypothesis	Coefficient	t-value	Result
1- There is a significant relationship between organizational learning and readiness for change	0.50	5.45	Accepted

According to the results shown in[table 2], the effect of the independent variable on the dependent one has been supported by the data and the path that related these two variables together is a positive and significant one (it is significant at the error level of 5 percent) (t=5.45, β22=0.50); therefore, with the confidence level of 95%, it can be said that there is a significant relationship between organizational learning and readiness for change.

The second hypothesis: there is a significant relationship between readiness for change and job engagement.

Table 3: the results of second hypothesis's test

Hypothesis	Coefficient	t-value	Result
2- There is a significant relationship between readiness for change and job engagement.	0.96	4.46	Accepted

According to the results shown in table (3), the effect of the independent variable on the dependent one has been supported by the data and the path that related these two variables together is a positive and significant one (it is significant at the error level of 5 percent) (t=4.46, β22=0.96); therefore, with the confidence level of 95%, it can be said that there is a significant relationship between readiness for change and job engagement.

The third hypothesis: there is a significant relationship between organizational learning and job engagement.

Table 4: the results of third hypothesis's test

Hypothesis	Coefficient	t-value	Result
3- There is a significant relationship between organizational learning and job engagement.	0.15	1.75	Accepted

According to the results shown in [table 4], the effect of the independent variable on the dependent one has been supported by the data and the path that related these two variables together is a positive and significant one (it is significant at the error level of 5 percent) (t=1.75, β22=0.15); therefore, with the confidence level of 95%, it can be said that there is a significant relationship between organizational learning and job engagement.

The fourth hypothesis: There is a significant relationship between organizational learning and job engagement with the mediation of readiness for change.

Table 5: the results of fourth hypothesis's test

Hypothesis	Coefficient	Statistic t	Results
4-There is a significant relationship between organizational learning and job engagement with the mediation of readiness for change.		0.50×0.96=0.48	accepted

The result of testing the hypothesis 4 is reviewed by considering the information presented in [table 5]. Reviewing the mediating role of readiness for change between organizational learning and job engagement is done in such a way that if the direct effect of organizational learning on readiness for change is confirmed as well as the direct effect of readiness for change on job engagement, the mediating effect of readiness for change between organizational learning and job engagement is also confirmed. The path coefficient of the endogenous latent variable readiness for change is 0.50 and with the t-value being equal to 5.45 at the error level of 0.05 with the confidence of 0.95%, the required statistic is significant

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and the path coefficient of the endogenous latent variable job engagement is 0.96 with the t-value being equal to 4.46 at the error level of 0.05 with the confidence of 0.95%, the required statistic is significant. Therefore, the effect of the mediating role of readiness for change between organizational learning and job engagement is equal to 0.50×0.96=0.48 and what the researcher claims is confirmed.

CONCLUSION

The results of the first hypothesis showed that the rate of the path coefficient between organizational learning and readiness for change is 0.50 and the t-value associated with it is 5.45>1.96 and according to the t-test, with the critical value of 0.05 at the confidence level of 95%, the H0 can be rejected and therefore the first claim of the researcher has been confirmed and with the confidence of 95%, it can be said that there is a significant relationship between organizational learning and readiness for change.

The results of the second hypothesis showed that the rate of the path coefficient between readiness for change and job engagement is 0.96 and the t-value associated with it is 4.46>1.96 and according to the t-test, with the critical value of 0.05 at the confidence level of 95%, the H0 can be rejected and therefore the second claim of the researcher has been confirmed and with the confidence of 95%, it can be said that there is a significant relationship between readiness for change and job engagement.

The results of the third hypothesis showed that the rate of the path coefficient between organizational learning and job engagement is 0.50 and the t-value associated with it is 1.75>1.96 and according to the t-test, with the critical value of 0.05 at the confidence level of 95%, the H0 can be rejected and therefore the third claim of the researcher has been confirmed and with the confidence of 95%, it can be said that there is a significant relationship between organizational learning and job engagement.

The results of the fourth hypothesis showed that the rate of the path coefficient between organizational learning and readiness for change is 0.50 and the t-value associated with it is 5.45>1.96 and the rate of the path coefficient between readiness for change and job engagement is equal to 0.96 and the t-value associated with it is 4.46>1.96 and according to the t-test, with the critical value of 0.05 at the confidence level of 95%, the H0 can be rejected and therefore the effect of the mediating role of readiness for change between organizational learning and job engagement is equal to 0.50×0.96=0.48 and the fourth claim of the researcher is confirmed.

CONFLICT OF INTEREST
There is no conflict of interest

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None

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ARTICLE

AN EXPLANATION OF THE RELATIONSHIP BETWEEN ORGANIZATIONAL INDIFFERENCE AND JOB PERFORMANCE OF STAFFS WITH THE MEDIATING ROLE OF CULTURAL INTELLIGENCE (A CASE STUDY: CUSTOMS OFFICE STAFFS IN TEHRAN)

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ABSTRACT

Background: The present study objective is to examine the relation between organizational indifference and job performance of staffs with the mediating role of cultural intelligence. Methods: The population is 180 staffs of Tehran custom office. Sampling is simple and random and by using Cochran's formula, the sample is 122 staffs. The required data of the present study has been gathered using a questionnaire that its validity was tested. To determine reliability and validity of the questionnaires, contend validity and Cronbach's alpha coefficient are used. Reliability coefficient was 0.84 for Paterson's job performance questionnaire (2010), 0.86 for Ang's et al cultural intelligence questionnaire (2004), and for organizational indifference questionnaire of Danaee Fard et al (2010) was 0.78. In the current study, structural relation model is used to analyze the data. To analyze data and test the hypotheses and other analyses of this study, LISERL software was used. Results: The results indicated that there is a significant relation between job performance of staffs and cultural intelligence.

INTRODUCTION

Given that the level of success to achieve organizational goals is directly related to the performance of human resource of organizations. So nowadays, organizations are looking for new methods to promote their performance. Human's performance is defined as a collection of actions in order to achieve a goal on the basis of a special standard. Actions might include visible behavior or in visible mental process (for example problem solving, decision making, planning, reasoning). Therefore, job performance in organizations has been studied very much. But this issue can be meaningful just when we comprehend that victory or failure of an organization depends on the performance of its staffs[1]. According to scholars, a person's performance in an organization depends on his personality and the organizational role he is handling as well as organizational success and conditions. Performance is a predicted criteria or key benchmark in the represented framework that the framework acts as a means to judge about effectiveness of people, groups and organizations. Examining staffs' behavior in organizations is inevitable. Managers must constantly consider evaluation of their staffs' behavior in addition to their performance. Therefore, human capital and human resource development are considered as the key topics of the present era. To keep and maintain this capital for a long time, it is essential to conduct deep studies and influential efforts. One of the consequences of lack of attention to human recourse is creating a phenomenon in the name of organizational indifference. The phenomenon is a feature of people who are occupied with repetitive and boring tasks and often succumb to the fact that in the workplace there is little hope for improvement. Basically, this distinct mental- behavioral status is called personal indifference and it is known to be the result of deprivation of the person and a sign of problem at work. Indifference is a type of silent crisis; slow collapse; continuous and silent degradation that suppress creativity and risk taking [2]. Also, it takes people's motivation and attempt for work and therefore, indifferent staffs form an indifferent organization. Indifferent staffs have less commitment to the organization, consequently they have direct and negative effect on the performance of organization [3]. On the other hand, due to increasing growth of international communication and transaction and workforce diversity, many experts have concentrated their attention on identification and enhancement of capabilities which lead to an effective presence in the increasingly complex and dynamic environments. Among these capabilities, cultural intelligence is the most important ability that can be applied to confront multi- cultural situations appropriately. Cultural intelligence helps us to show appropriate behaviors to various cultural components by fast and correct comprehension of them [4]. Moreover, cultural intelligence is one the most efficient tools to fulfill the tasks effectively at environments having variety and diversity of workforce; this type of intelligence is a special ability and skill that allows the person to be able to carry out his tasks effectively [5]. Therefore, the present study objective is to examine the relation between organization indifference and job performance of staffs with the mediating role of cultural intelligence.

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RESEARCH'S LITRATURE

Organizational indifference

Silence and disappointment toward destination and plans of the organization as well as lack of effective understanding between staffs and the management are danger alarms showing organizational performance reduction [6]. Therefore, one the most important human resources issues in this era is organizational indifference of staffs [7], but this behavior has not been considered a lot by organizations. Psychologists believe that indifference happens when a person, after the long frustrations, loses his hopes of achieving the target or targets in a special condition and wants to withdraw from the source of his frustration. In their ideas, failure is a result of unfruitful attempts of a person on the way to get to target because of facing with the obstacle or barriers and failure to adjust or replace the goal or goals. The term indifference is an unfamiliar and threatening word for majority of people. This is probably the reason that managers do not apply this term to explain their problems and issues of organizations. Yet, effective managers must focus on the main issue not just on the signs. According to David Byrd (2008), indifference at work exists at any level in any organizations of the world, because it is a part of instinct and nature of human being [8]. Depending on from which angle and by which approach we look at the phenomenon of indifference, its definition will differ. Kaplan and Sadok have defined it as a status of lack of interior feeling and emotion, lack of interest and involvement of excitement toward the surrounding. Michele (1988) and Kinston (1985) call it as a kind of sense of separation, isolation and lack of objective and subjective connection between the individual and the society. In addition, they have defined indifference as a sort of imagination, attitude and feeling that is resulted from waiting for lack of effectiveness and determining of a person's behavior in creation of results or manipulation of facts [9]. Indifference in the organization is indicative of a problem in the organization and managers must take it very serious among staffs[10]. Organizational indifference of staffs is one the destructive organizational factors. It leads to mental departure between the organization and staffs and also causes lack of motivation, organizational commitment reduction, organizational performance and participation among people as well as failure of organization to achieve its goals. Consequently, productivity of an organization will reduce. Importance and value of the study will be clearer when it is seen that reducing organizational indifference can reduce turnover, increase motivation, job satisfaction, employees' performance, competitive advantage, organizational success and productivity [11]. Abdollahi et al (2014) believe that numerous factors effect on indifference of staffs, including: organizational justice weakness, motivation, intelligence of managers in the organizations, managerial triple skills, salary and rewards system, performance evaluation system, promotion and appointment, insufficient attention to the person and family problems, role ambiguity and inappropriate citizenship behavior. Furthermore, the results of studies in the domain of human resource are indicative of the fact that performance of staffs in order to fulfill goals of the organization is affected by their attitude and comprehension of various issues that are running in the organization[12]. In fact, when there is no supervision over performance of staffs and they are not aware of results of their actions, they will not understand whether they have fulfilled their tasks well or not; Or, it will not be founded out if there is any problem or defect in their works, and also effect of their performance on the organization to get to its goals will not be seen. As a result, the person will feel indifference.

Job performance

When talking about performance, it comes to mind that some people apply performance for the process of doing tasks and how to it. In the overall plan of evaluating performance of staffs, performance means both the results of the task and the process of doing the task. It means that in evaluation, how to do the job- in the other term the process of work- with the results of the process are both considered as performance and will be judged [13]. As researchers believe, performance is a multi-dimensional structure and can be considered as history of attained results. In personal perspective, performance is the success history of a person. A person's performance is a benchmark for his success rate in his work. Human's performance is defined as a collection of actions to achieve a goal on the basis of a special standard. These actions might be visible behaviors or invisible mental process (for example problem solving, decision making, planning and reasoning). Job performance is defined as a degree of accomplishment of duties assigned to a person [14]. In addition, job performance includes product and operational efficiency of people in relation to the jobs they are carrying. On the other hand, performance is the actual work of people according to their job prescription. In fact job performance is accomplishing the tasks that are handed to human recourse by the organization. Viswesvaran and Vance (2000), know job performance as behaviors through which staffs will be involved in the organizational goals and assist organizational purposes. Rogelberg (2007) has defined performance as activities that are normally a part of a person's job and activities and must be done. In general, effective factors on organizational performance are as the following: organizational structure- environment of organization- policies and the processes of the organization. Making use of organizational structure will officially divide, categorize and coordinate the tasks. When managers are to plan the structure of organization, they must consider six main factors or bases. They include: division of labor, job classification, chain of command, and control territory, attention to centralization and decentralization and finally formalizing the tasks. The meaning of the term "environment" is limited and just includes all the things that are located out of the organization. But in the analysis done here, just the aspects of environment that organization is keen toward and must react against them for its survival are considered. Therefore, environment of organization is defined as: all the factors that are out of the boundary of organization and have potential effects on the entire or a part of the organization[15]. Performance is evaluated in the domains of knowledge, skill and ability:

Knowledge: is learned education and experience in order to perform duties, organizing information, knowing information about laws, directives and procedures, believing in documentation and knowing what must be done.

Skill: includes useful and practical experience, the art of combining knowledge with the demanded task, collecting analyses and purifying data, working with new systems, solving partial problems, and the skill of documentation.

Ability: is using learned knowledge and skills to perform duties, accomplishing the handed tasks as the best possible in complicated situations [16].

Murray Ainsworth and Newell Smith know performance as a subordinate of clarity of the roles, competencies, culture, values, preferred fitness and rewards. In equation of Ainsworth and Newell, the performance factors in the Mayer equation are mentioned under the title of competence and fitness. Studies have constantly shown that in addition to knowledge, skills and talents, personality is another characteristic that is a valid predictor of job performance especially contextual performance and person-organization interaction [17]. The applied applications to evaluate performance in the organizations are: manpower planning, staffing, determining the Test Recruitment, recognizing training Needs and trying to handle them , determining career path, determining a benchmark to pay material rewards, recognizing abilities of employees and deciding about encouragement, promotion, transfer and discounting employees.

Cultural intelligence

Cultural intelligence is in fact multi-faceted and multi-dimensional in which human tendencies related to other cultures are analyzed and evaluated from various angles [18]. Many scholars have defined cultural intelligence as the ability of a person to effectively accomplish the tasks in various cultural situations [19,20]. Thomas and Arlon have defined cultural intelligence as a system of interactive abilities. In fact, cultural intelligence is a capability that allows people to have an accurate and good comprehension when facing with various cultures and act appropriately. Earley and Ang know cultural intelligence as an independent structure that is used in specific cultural conditions. This type of intelligence is able to improve comprehension and understandings of inter- cultural interactions [21]. Organizations and managers that have comprehended the strategic value of cultural intelligence can use cultural differences and diversity in order to create competitive advantage and superiority in the world. Cultural intelligence teaches managers and staffs a way of thinking and acting so that they will be able to act more effectively in any cultural context [22]. Cultural intelligence is, in fact, the definition of intelligence in the field of culture. The concept of cultural intelligence was introduced by Early and Ang. They both have defined cultural intelligence the ability to learn new patterns of cultural interaction and provide correct behavioral responses to this template[20]. A person having high cultural intelligence comprehends cultural boundaries, knows that theses boundaries are able to make a framework for our behaviors and others'. According to these points, the person can determine how to think and how to react in various conditions and also is able to reduce these boundaries in keen situations in favor of goals of organization. Cultural intelligence is a novel type of intelligence that has a great relation with various cultural workplaces. Peterson knows cultural intelligence as the talent of applying skills and abilities in various environments [23]. Nowadays, organizations are looking for managers who can adapt continuously to people from different cultures and are able to manage inter-cultural relations. Workplace of today needs people who are familiar with various cultures and can connect well with people of other cultures. For this purpose, people need cultural intelligence. Ability of the person to be adjusted with various values, customs and traditions different from what he has been accustomed to and working in a different cultural workplace is indicative of cultural intelligence [24].
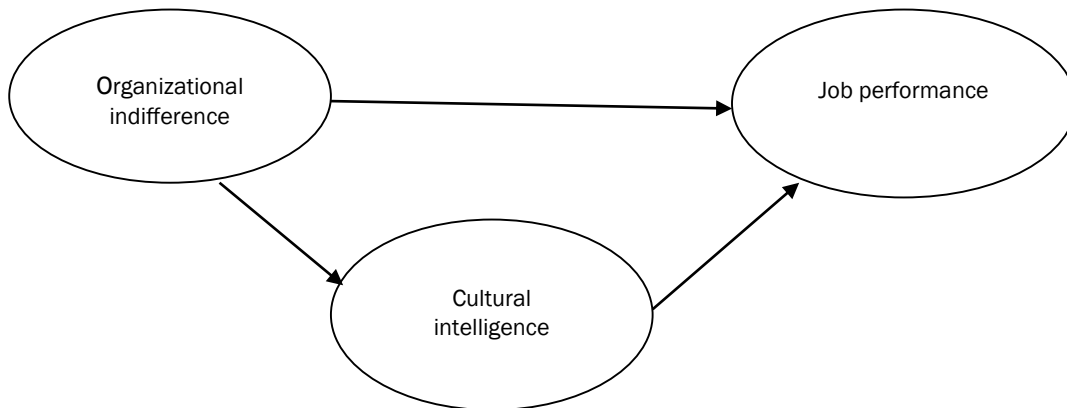

Fig. 1: conceptual model

Research's hypotheses

1-There is a significant relation between organizational indifference and cultural intelligence .

2-There is a significant relation between cultural intelligence and job performance.

3-There is a significant relation between organizational indifference and job performance.

4-There is a significant relation between organizational indifference and job performance with the mediating role of cultural intelligence.

MATERIALS AND METHODS

The required data for the present study has been collected by a questionnaire that its validity was tested. The researcher has used a 32- question questionnaire with all the questions in the form of Likert five- item scale to collect information. The data has been analyzed by LISERL software. Population of the study is 180 staffs of the Custom Office of Tehran. Sampling is simple and random and by using Cochran Formula, the sample is 122 staffs. The necessary data for the present study has been collected by a questionnaire that its validity was tested. In order to test the validity and reliability of the questionnaires, content validity and Cronbach's Alpha test are used. Reliability coefficient is 0.84 for Paterson's job performance standard questionnaire (2010), 0.86 for cultural intelligence questionnaire of Ang et al (2004), and 0.78 for organizational indifference questionnaire of Danaee Fard et al [25]. In the present study, after drawing the analytical model of the study based on data by Path diagram program through running Perlis program form LISERL software, measuring model has been attained. In this model, using B coefficients and t test, the hypotheses have been tested. In addition, fit indexes of model have been automatically calculated by running Perlis program of the model.

Data analysis

Table 1: fit indexes of study

Estimated values	Standard values	Fit index
430	--------	Degrees of Freedom
995,95	Not a good criteria due to dependence on the sample	Chi-Square
0,081	0,05	RMSEA
0,91	0,90	NFI
0,94	0,90	NNFI
0,95	0,90	CFI
0,061	0,05	RMR
0,76	0,90	GFI
0,72	0,90	AGFI

As it is clear in [Table 1], adaption indicators of fit indexes are at an acceptable level.

Testing the structural model

In this study, Confirmatory factor analysis is used for measuring model testing and path analysis is used for confirming structural model of study. The following two diagrams indicate total output models of LISERL software that they include both structural model and measuring model which will be analyzed later in details.
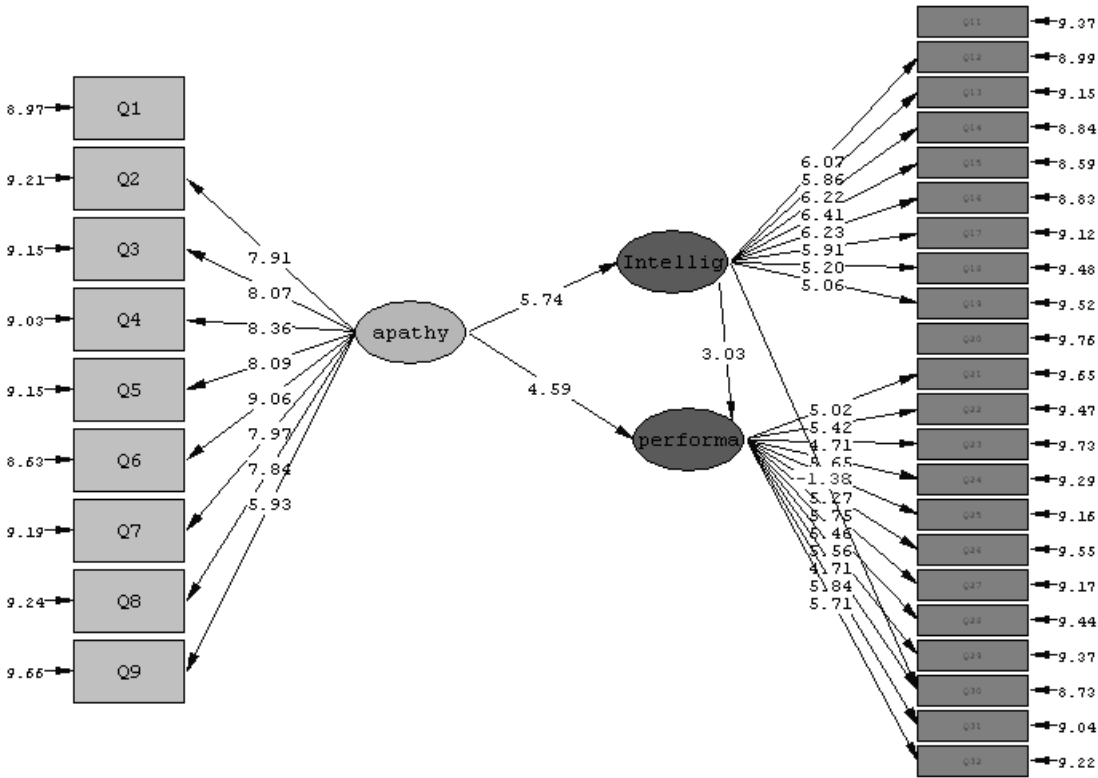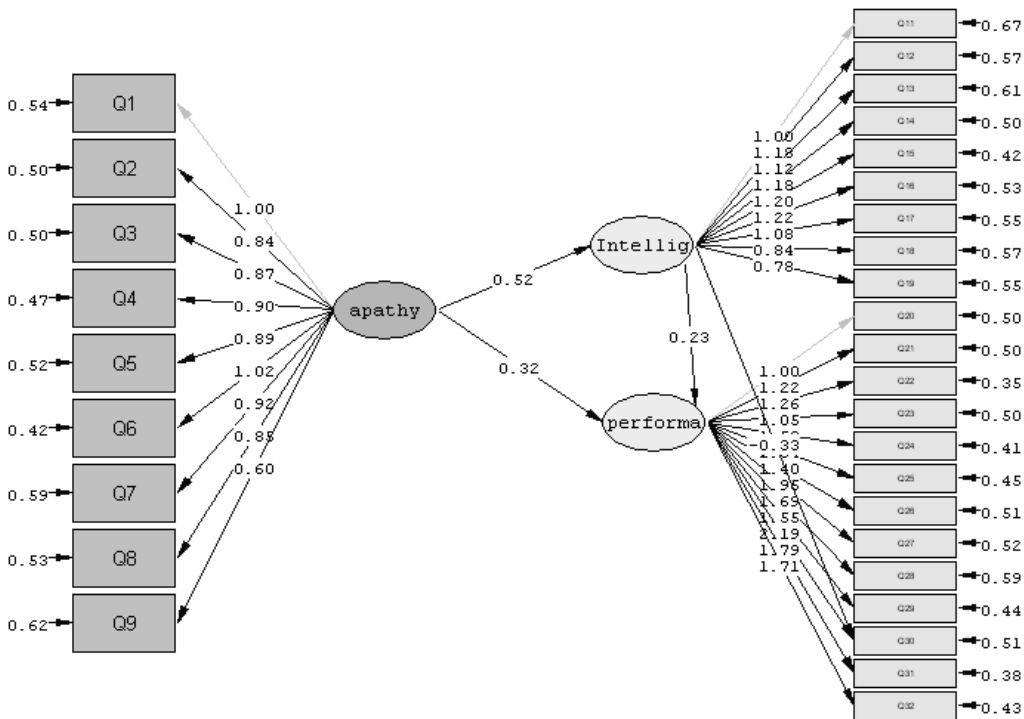
Fig. 2: Base model with T value

Chi-Square=995.95, df=430, P-value=0.00000, RMSEA=0.081

Fig. 3: Base model with rout coefficient

At structural model, Beta coefficients which show the level of solidarity between hidden variables have been appeared in diagrams that connect hidden variables together.

RESULTS

The first hypothesis: There is a significant relation between organizational indifference and cultural intelligence

Table 2: the results of first hypothesis's test

Hypothesis	Coefficient	Statistic t	Results
There is a significant relation between organizational indifference and cultural intelligence	0.52	5.74	accepted

According to the results indicated in [table 2], the effect of independent variable on dependent one is confirmed by the data. Also, the path connecting these two variables is positive and significant (it is significant at the error level of 5 percent) ($t = 5.74, \beta_{22} = 0.52$). As a result, with 95 percent confidence, it can be concluded that there is a significant relation between organizational indifference and cultural intelligence.

The second hypothesis: there is a significant relation between cultural intelligence and job performance

Table 3: the results of second hypothesis's test

Hypothesis	Coefficient	Statistic t	Results
there is a significant relation between cultural intelligence and job performance	0.23	3.03	accepted

According to the results indicated in [table 3], the effect of independent variable on dependent one is confirmed by the data. Also, the path connecting these two variables is positive and significant (it is significant at the error level of 5 percent) ($t = 3.03, \beta_{22} = 0.23$). As a result, with 95 percent confidence, it can be concluded that there is a significant relation between cultural intelligence and job performance.

The third hypothesis: there is a significant relation between organizational indifference and job performance

Table 4: the results of third hypothesis's test

Hypothesis	Coefficient	Statistic t	Results
there is a significant relation between organizational indifference and job performance	0.32	4.59	accepted

According to the results indicated in [table 4], the effect of independent variable on dependent one is confirmed by the data. Also, the path connecting these two variables is positive and significant (it is significant at the error level of 5 percent) ($t = 4.59, \beta_{22} = 0.32$). As a result, with 95 percent confidence, it can be concluded that there is a significant relation between organizational indifference and job performance.

The fourth hypothesis: There is a significant relation between organizational indifference and job performance with the mediating role of cultural intelligence.

Table 5: the results of fourth hypothesis's test

Hypothesis	Coefficient	Statistic t	Results
There is a significant relation between organizational indifference and job performance with the mediating role of cultural intelligence.	0.52×0.23=0.11		accepted

A result of the fourth hypothesis is examined according to information in [table 5]. Examining the mediating role of cultural intelligence between organizational indifference and job performance is confirmed if the direct effect of organizational indifference on cultural intelligence is confirmed; and if the direct effect of cultural intelligence on job performance is confirmed. The coefficient path of exogenous latent variable of organizational indifference on endogenous variable of cultural intelligence is 0.52. With t value equal to 5.74 at the 0.05 level of error and with 95 % confidence, the statistic is significant. Also, the coefficient path of endogenous latent variable of cultural intelligence on exogenous variable of organizational indifference is 0.23 with t value of 3.03 at 0.05 level of error which is, with 95 % confidence, significant. Consequently, the effect of the mediating role of cultural intelligence between organizational indifference and job performance equals to 0.52×0.23=0.11 and the researcher's claim is confirmed.

CONCLUSION

The result of the first hypothesis showed that coefficient path between organizational indifference and cultural intelligence is 0.52 and the related t value is 5.74> 1.96. According to t test with critical value of 0.05, at a 95 % confidence, the null hypothesis is rejected. As a result, the first claim of researcher has been approved. With 95% confidence, it can be concluded that there is a significant relation between organizational indifference and cultural intelligence.
 The result of the second hypothesis showed that coefficient path between cultural intelligence and job performance is 0.23 and the related t value is 3.03> 1.96. According to t test with critical value of 0.05, at a confidence level of 95 %, the null hypothesis is rejected. As a result, the second claim of researcher has been approved. With 95% confidence, it can be concluded that there is a significant relation between cultural intelligence and job performance.
The result of the third hypothesis showed that coefficient path between organizational indifference and job performance is 0.32 and the related t value is 4.59> 1.96. According to t test with critical value of 0.05, at a confidence level of 95%, the null hypothesis is rejected. As a result, the third claim of researcher has been approved. With 95% confidence, it can be concluded that there is a significant relation between organizational indifference and job performance.
The result of the fourth hypothesis showed that coefficient path between organizational indifference and cultural intelligence is 0.52 and the related t value is 5.74> 1.96 and also, coefficient path between cultural intelligence and job performance is 0.23 and the related t value is 3.03> 1.96.According to t test with critical value of 0.05, at a confidence level of 95 %,, the null hypothesis is rejected. As a result, the effect of mediating role of cultural intelligence between organizational indifference and job performance equals to 0.52×0.23=0.1 and the fourth claim of the researcher is approved.

CONFLICT OF INTEREST
There is no conflict of interest

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None

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ARTICLE

RANKING NEIGHBORHOODS IN TERMS OF MOVEMENT TOWARDS CREATIVITY WITH AN EMPHASIS ON THE REALIZATION OF THE CREATIVE TOWN; CASE STUDY: NEIGHBORHOODS IN DISTRICT 1 KERMAN

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ABSTRACT

Movement towards creation and realization of a creative town is very essential and important due to the role of towns as the place for formation of knowledge society beds, as well as importance of towns in economic development. The present study aimed to examine creative town components in neighborhoods in district 1 Kerman in order to move towards development of creative neighborhoods. According to the examined components, the present study was an applied research with an analytical description approach. Public space is one of the most important urban elements so that the town is basically introduced by them. Urban spaces, in general, and public spaces, in particular, can be favorable environments for prevalence of creativity in a town. In this study, taking into account the criteria of creative town and their correlation with neighborhoods in Kerman (district 1), the neighborhoods ranking was performed. Accordingly, the Bazar shah neighborhood and Shahzadeh Shahrokh neighborhood were placed at the top and the bottom of ranking, respectively.

INTRODUCTION

Problem Statement

Sometimes, citizens can experience rapid growth of a town and moving towards urban sprawl so that many of their original features are loss among the new suburbs and cost of living is increased. At the same time, urban managers perform actions such as implementation of effective plans of land use, zoning and reuse lands abandoned at the town center, to address these problems (1). [7] Although this process leads to expansion of science, technology, and innovation centers and ultimately development of creative human capital, but as long as such a development is formed based on traditional theoretical foundations, it has consequences such as rising unemployment, increasing spatial inequality and worsening social and economic gap (2). [13] In this regard, movement towards creation and realization of a creative towns is a basic solution to resolve these crises. Today, talents, motivations, desires, dreams and creativity of citizens gradually replaced the traditional advantages of cities such as their location, natural resources and proximity to markets. Creativity of people who live in a city or are responsible for urban management ensures success of the city in the future (3). [4]

Movement towards creation and realization of a creative town is very essential and important as a basic requirement of the formation of science and technology clusters and the role of towns in attracting, utilizing and retaining human capital in the creative class due to the role of towns as the place for formation of knowledge society beds, as well as importance of towns in economic development (4). [2]

In a creative town not only artists and those who are involved in economic activities are creative, but also creativity can originate from whatever source in the society. Engineers, executives, etc. all are working in a creative manner. So far, creativity was a necessity for artists, but in creative towns, it is attempted to extend this feature to all professions and guilds (5).[3]

Research questions

1- The components affecting creation of a creative town?
2- The effectiveness of every component in realization of a creative town?

Research objectives

1- Examining creative town components in neighborhoods in district 1 Kerman
2- Identifying the effectiveness of each component in realization of a creative town in neighborhoods in Kerman
3- Ranking the neighborhoods in district 1 Kerman

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MATERIALS AND METHODS

In **Table 1** According to the research objectives and the examined components, the present study was an applied research with an analytical description approach based on data provided by housing and

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population studies, statistical yearbooks, municipalities, higher education centers, and relevant organizations and institutions. The population was the neighborhoods in district 1 based on political-administrative divisions. The data collection tool for examining the criteria of creative town contained 20 indicators of creative town (6). [6] Then, according to the characteristics of ANP, and features of the desired region, the initial data were classified, the significant priorities affecting creativity were examined and consequently the conceptual model of ANP was prepared.

Variables and indicators

Human capital	Population density, number of students, highly educated people, immigrants entered for education
Innovation	Number of science and technology centers, number of inventions, number of researchers, number of industrial clusters
Quality of life	Leisure, economic status, physical condition, environmental condition
Social capital	Social participation, cooperation, great interest to the society

Table 1: Creative town indicators (Reference: authors)

The pillars of creative towns

People, businesses, spaces, links and prospect are the five pillars of creative towns. Taking into account these pillars is very crucial to create and develop creative towns in the future.

People

In creative towns the conditions and practices should be considered that lead to the emergence of future artists, success of creative workers in all economic sectors, attraction of consumers to cultural goods, and creation of attractive environment for creative people. Strong public education and access to cultural activities play a vital role in the formation of creative people and lead to promote social commitments and contributions.

Businesses

Creativity often leads to economic opportunities and cultural entrepreneurs start creative businesses and grow them. Commercialization of innovative and creative ideas leads to jobs and wealth creation in creative towns. Moreover, it should be considered that how creative businesses benefit from entrepreneurial support, training and coaching, incubators and convergent centers. Commercialization is the key of economic benefits gained by healthy and creative businesses. In creative towns, frequency of creative talents is the main propellant of creative industries and economy of the region.

Space

There is a strong correlation between space and creativity. Creative people need space to live, work, inspiration, and presentations of their works. Spaces in a city including natural and artificial spaces lead to motivation, adaptation and expression of creativity of their residences. Creative Spaces must be inspiring and empowering. Because, creativity requires spaces for growth and work, thinking and innovating, developing and accumulating and ultimately being progressed.

Links and communications

An urban environment that seeks to stimulate and support creativity, must be able to link many separate proceedings. These links often are led and developed by organizations that creativity is their vision and mission. Intermediate organizations that organize individual activities and use available resources effectively, support these links. to maintain for sustainability and stability, ecology of a town creativity must be well integrated in a way that artists, creative industries, government agencies, investment programs, and community of scholars be able to interact with each other productively and effectively. Creative towns need linking infrastructures to support their creativity ecology.

Prospect

In creative towns, expression of a strong and creative prospect will lead to grow talents. It also guides and organizes supporting the creativity widely in the town. This prospect tells the story of the town all over the world, makes it famous in the world and promotes tourism, exports and investment in the town.

Theoretical foundations

Debord (1967) raised a topic entitled "Spectacular city or show city" for the first time. He believed in the early emergence of the idea of integrating economic and cultural spaces on the human scale, especially in issues such as new generating spaces and cultural complexes, and demonstrating visual environments that are numerous in major metropolises around the world (Scoott, 006). Richard Florida was the first one who proposed creative areas and towns. In 2002, he published his first book entitled "Creative class", and then in 2005, another book of him was published to strengthen the topic. Alan Scott (2007) using the language used by Richard Florida, raised issues on creative areas and towns. Peter Hall in his famous book (Cities in civilization) argues that cities are cradles of creativity and this is true for very different kinds of creativity, e.g. cultural, artistic, technological, and organizational creativity, as well as intersections between them, e.g. when technological and artistic creativities are combined in film industry, recorded music, television, and multimedia. It seems that things that form the artistic and cultural creativities are largely the same as those who form technological creativity. Therefore, it can be said that there are enormous factors causing innovation and creativity in a city or community. It is obvious that in the today's global environment, the pressure for economic modernization is combined with some innovations. Such renewal includes association and constitution in the new global economy based on different assets such as location, geography, culture, skills and knowledge.

In developing countries, keeping up with the global economy normally requires a multifaceted approach. Retention and absorption of active citizens, investment and employment, enhancing quality of places through investment in infrastructures and facilities in less developed neighborhoods or in areas with high concentrations, lead to move towards creative and dynamic town (Duxbury, 2004: 18). Since, cities are varied, full of interaction and fraught with problems, large gatherings of people are inherently complex and inconvenient, so people in cities always had to be creative in order to establish and develop a basic urban order. Therefore, cities increasingly use creative town concepts (7)[12] with an emphasis on the importance of culture and art in the contexts of town (8).[11] So, the aim of realization of such a town is to looak at the town as an art work in which citizens through interacting and contributing and creating innovation cause environmental changes and livability. This requires creativity in areas such as engineering, social work, planning, crisis management and experts in the fields of architecture, housing, information technology, environmental psychology, archeology, natural sciences, environment, artists, and above all, ordinary people as citizens in order to form a creative town (7)[12]

Literature review

In history of cities of our country, one can find documents relating to the UNESCO national commission letter to the governor of Fars in which it is requested to prepare the basics of introducing Shiraz to the scientific, educational and cultural organization of UNESCO. If so, Shiraz will be the first Iranian city listed in the UNESCO creative cities. For final registration of Shiraz in the literature sector of the UNESCO creative cities, some specific standards are required such as possibility of holding artistic and literary festivals, active publications, literature courses in universities, library and important book stores (Edinburgh) that are listed in the UNESCO creative cities of literature. UNESCO implements the creative cities program with the aim to create a network of interconnected cities that are active and effective in seven fields of literature, cinema, music, folk art, urban design, food and media arts. According to this organization, such a network helps to develop economic capabilities and cultural diversity of different cities around the world. So far, Berlin (Germany) and Buenos Aires (Argentina) as creative cities in the field of design, Santa Fe (Mexico) and Aswan (Egypt) as the cities of folk arts (folklore), and Popayán (Colombia) as the town of foods have been registered on the list of UNESCO Creative Cities (9). [1]

Year	Population	Population growth
1345	244356	-
1355	398652	154296

Characteristics and elements of creative towns and areas

A wide range of creative production and work options raised with the new post Fordism economy (A school in industrial productions), reveals the new world order in major metropolitan areas. Combination and integration of different aspects of economy and culture in various logical human orders is the main characteristic of creative areas (10)[10]. The key elements causing effective cities and areas include: Networks of regional producers, local labor market, i.e. the creative technicians and workers in an area who can be effective in shaping the development of creativity in the region and the city, and competition and cooperation between the cities that can inject the element of creativity to the region and the city. The issues in this area are mostly related to metropolitan regions and large cities, and so far away from larger cities, arguments about creativity become more associated with traditional elements than new elements. However, today, traditional elements such as jewelry, despite being traditional, can influence on formation of creative city as a creativity making industry (11).[8]

Problems in formation of creative areas

Paying attention to the points that hinder formation of creative cities and areas, and attempt to solve them are essential. Some of these problems are as follows: Although, large cities may have unparalleled creativity talents, but if social, cultural and economic inequalities prevail, it is impossible to access creative city correctly. In other words, creative cities and areas formation programs should cover basic citizenship issues and democracy (Scot, 2006). Cooperation of all social policies in active urban life is required not only to achieve social goals but also to remove citizens' creativity barriers on a large scale. In general, any pressure to achieve urban creativity in the absence of special attention to cooperation and expressed interest in urban community (social acceptance and contribution) is generally doomed to remain unfinished (Scoott, 2006)[9]

Finally, it should be mentioned that creativity is not something entering into the city easily with computer hackers, skate boards, happiness, etc., but it should be developed as an organic member among the set associated with production, work and social life in different urban aspects (11).[8]

In **Table 2 and 3** of households and the number of literate and illiterate've reviewed

1365	473264	74612
1375	579127	105863
1385	667346	88219
1390	722484	55138

Figure 1،2،3 and4 of the neighborhoods in District 1, Kerman،andThe schematic of the ANP model based ranking of neighborhoods in the case study area،andComparison between different groups; The prioritization matrix of ranking the neighborhoods in the case study area (District 1, Kerman);،andPriorities of groups in ranking evaluation of the neighborhoods in the case study area (District 1 Kerman); Examine

Table 2: The case study area (District 1 Kerman); Source: authors

Number of households	21398
Number of people	83530
Number of men	41586
Number of women	41947
Educated men	32940
Educated women	31173
Uneducated men	3224
Uneducated women	4906

Table 3: Evaluation of Kerman population (1966-2011); Source: Statistical Center of Iran (1966-2011)

Neighborhood	Population	Number of households
Khajeh Khezr	4180	1045
Shah Adel	932	233
Bagh Lellah	480	120
Shahzadeh Shahrokh	1480	370

Hozeh Malek	684	171

Number of households	21398
Number of people	83530
Number of men	41586
Number of women	41947
Educated men	32940
Educated women	31173
Uneducated men	3224
Uneducated women	4906

In Table 4 have examined the population and number of households at the local level

Table 4: Distribution of population and households in Kerman neighborhoods; Source: Statistical Center of Iran (1966-2011)
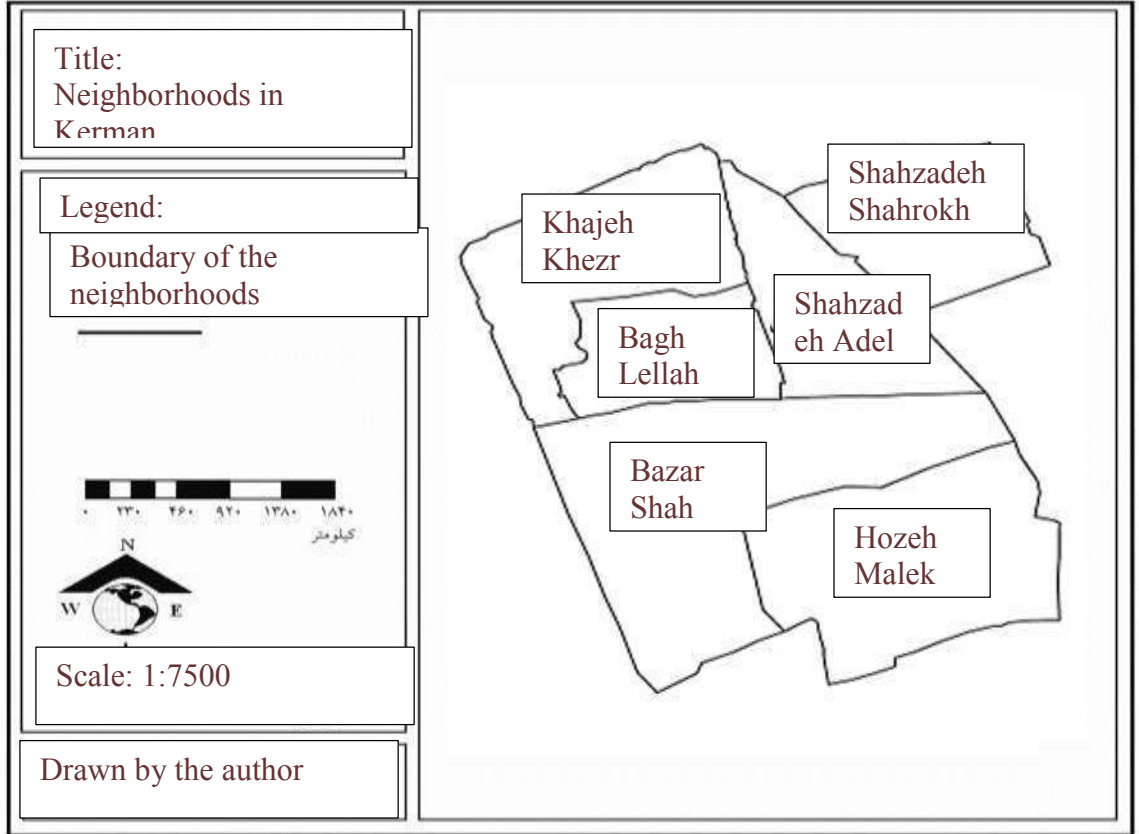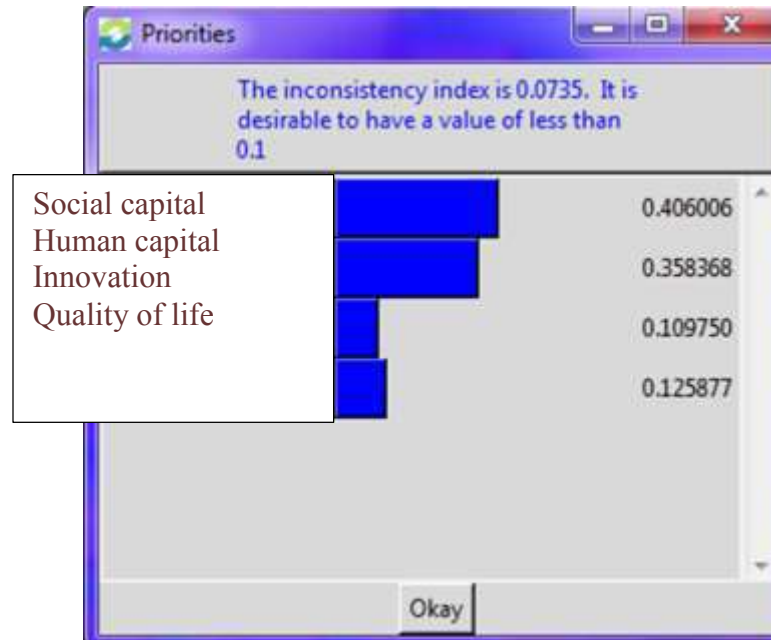
Figure 1: Map of the neighborhoods in District 1, Kerman; Source: Kerman Municipality, 2010

Application of the ANP model in prioritization of major factors affecting formation of creativity fields

Alternative

Bagh Lellah, Bazr Shah, Ghale Mahmoud, Hozeh MAlek, Khajeh Khezr, Masjed Malek, Meydan Ghale, Shahzadeh Shahrokh, Shah Adel, Pamenar

Figure 2: The schematic of the ANP model based ranking of neighborhoods in the case study area (District 1, Kerman); Title represent clusters and subgroups); Source: authors

Social capital
Human capital
Innovation
Quality of life

The inconsistency index is 0.0735. It is desirable to have a value of less than 0.1

0.406006
0.358368
0.109750
0.125877

Figure 3: Comparison between different groups; The prioritization matrix of ranking the neighborhoods in the case study area (District 1, Kerman); Source: authors

Hozeh Malek
Khajeh Khezr
Shah Adel
Shahzadeh Shahrokh

Figure 4: Priorities of groups in ranking evaluation of the neighborhoods in the case study area (District 1 Kerman); Source: authors

Ranking the neighborhoods in district 1, Kerman, Iran in terms of movement towards creativity

Foresight and achieving the desired development in different geographical regions is one of the main purposes of planning. This requires careful study and understanding of regions and the potential and actual talents, as well as monitoring and evaluating the relationship between factors affecting development in the region. To this aim, different methods and techniques should be used. Quantitative or mathematical technique is one of these approaches (Mohammadi, 2002:43). [5] The studies showed that Bazar Shah and Bagh Lellah neighborhoods have the maximum creativity level, in terms of the studied indicators, and Shah Adel and Shahzadeh Shahrokh have the minimum creativity level. Therefore, the neighborhoods with the maximum creativity level are moving towards creativity and innovation. Realization of creative town is possible through medium and long-term planning.

CONCLUSION

Movement towards creation and realization of creative towns is the basic solution for these crisis. These cities become attractive places for education, work and maintaining elites, with an emphasis on elites and experts of urban planning, urban management, urbanists and other relevant sciences. By improving quality of universities and science centers, quality of work, quality of life, tolerance levels and lifestyle, a city can move in this direction. The studies showed that Bazar Shah and Bagh Lellah neighborhoods have the maximum creativity level, in terms of the studied indicators, and Shah Adel and Shahzadeh Shahrokh have the minimum creativity level. Therefore, the neighborhoods with the maximum creativity level are moving towards creativity and innovation. Realization of creative town is possible through medium and long-term planning.

Recommendations
- It is recommended to establish city management elite association and elite thinking rooms in Kerman to fill the gap exist in decision-making system and to help management forces to link optimal implementation of urban projects to knowledge through intellectual assistance to urban managers in administrative and research programs and to solve problems with intellectual and consultation support and with the major role of elites' ideas in the society. So that, these centers can help to utilize new opportunities and create more benefits for each of the neighborhoods in Kerman by creating new ideas and growth and offering them to managers, in connection with universities and research and education centers.
- Equitable distribution of scientific and technological services and facilities as well as higher education centers in neighborhoods with an emphasis on more investment in low level neighborhoods in order to coordinate the development and movement of all neighborhoods.
- Improving economic status of the neighborhoods residents with the expansion of urban entrepreneurship offices and educating specialists for various fields.
- Creating greater convergence between experts and urban management officials for optimal management of neighborhoods in Kerman.

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ARTICLE

THE SURVEY OF THE COLOR AND LIGHT PSYCHOLOGICAL EFFECTS IN IRANIAN TRADITIONAL ARCHITECTURE (CASE STUDY: TABATABA'EES HOUSE)

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ABSTRACT

In the past, the subject of the relationship between the human beings and the environment and the way it was rendered into the architecture and environment designing language have been greatly focused on by the researchers of this field of study. In line with this, realizing the human characteristics and the environmental features and attributes in the periphery and the quality of establishing relationship between these two factors are of a great importance. Proper lighting in the human beings' living spaces including work environment, homes, etc. besides influencing the human efficiency and productivity results in the emergence of some adverse effects such as of anxiety, diminishing health and comfort and pertinent behavioral disorders. The windows with colorful glasses let in the light with various and diverse colors and in the meantime they can prevent a considerable percent of the hot and scorching radiations from entering the interiors and they play a role as light controllers as well. The current study is an analytical review on the color and light psychological effects regarding the environmental psychology in the Iranian traditional architecture, the interrelationships between the mankind and the environment and also the effect that the built environment quality has on the human beings' behaviors and psyche. In the current study it has been demonstrated that the interdisciplinary knowledge of "environmental psychology" has evolved out of the interactions between the two areas of behavioral sciences and the architecture and the designing theories have been drawn upon the human needs and perceptions of the life environment, thus the environmental psychology can be envisaged as being pertained to the common overlapping area between architecture and behavioral sciences. By dealing with such knowledge, the architectures attempt to analyze the relationship between the human beings and the environment and that how can it be taken advantage of in architectural designing procedures. The results obtained from the current study are connected to the survey of such effects and influences rates in Tabataba'ees' House sash window style which was selected for the present study as a case study and also the spectra of the glass colors applied therein were also evaluated and then there was made investigations regarding the effects such colors have on the human behavior. Finally, the appropriate lights that can be used in the buildings and are found to impose the smallest range of behavioral disorders on the humans were also identified. The current research is based on the qualitative studies and it has been conducted based on descriptive-analytical methods and the data collection tool has been library, articles and credible journal essays and documents and evidences and the written references study and investigation.

INTRODUCTION

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Windows are one of the elements in architecture which are to known to perpetually play an effective role in establishing order and coordination in the buildings or quite adversely cause perturbation. The new era evolutions and the boundless freedom in the formation of the buildings' elements have resulted in some sort of confusion and sometimes a monotonous form which is perceived as being irrelevant to the culture in the windows which, all in all, have led to windows role fading out in human beings' lives. Before the new era's effects and influences the windows used to play a considerable part regarding the human mental aspects (1).

Whatever building has been made in Kashan and its vicinity is made of mud and its derivatives. It is clear that the architects were not thinking of anything other than mud and they have not taken advantage of any other material and masonry since he would know that no other material can be replaced by mud even if there were to be found stones or wood in the proximity. In this region the life has been interdependently intertwined with soil and mud (2).

In constructing the traditional buildings and houses in the city of Kashan, paying attention to the environmental and climatic conditions for controlling and making use of the environmental capabilities has been greatly valued. In Kashan's traditional architecture, the entire elements and the components of the buildings are generated according to the environmental conditions and each of them plays a considerable role in providing for the creation of the optimum conditions. According to the effect that the sun movement causes on the various dimensions and aspects of the houses, the builders have considered special applicability for each of the house frontiers according to certain seasons and hours. According to this idea, the frontier facing the sun has to be used for winter life and the frontier in the opposite and away from the sun has to be used for spending the summers. Also, there are made

entrances to the basements for spending the hot summer days. In Kashan, a great section of the house has been made in the form of a small garden hole in order for a cold environment to be created through planting trees and creating a green area besides providing for having access to the water from the aqueducts and wells (3). In the table below, some of the features regarding the home designing systems are presented as showcasing the Tabataba'ees' home in Kashan (table 1).

Table 1: designing features in Tabataba'ees' house, source: Gorji Mahlbani,

Design characteristics	Effects
Four-porch style	For the purpose of making an appropriate use of every space according to a certain season
Winter-stay section with fireplace	For heating the area
Winter-stay section facing the sun	Taking advantage of the sun's natural energy
One-side open winter-stay section	For better and easier temperature control and easier traffic
Summer-stay section and alcove with higher decorations and in an upper level	For better air ventilation during hot seasons of the year
The garden hole section (the alley level is about five meter higher and the stable is also in an upper level	The reason for making use of the garden hole has been making use of the water for the aqueducts and reusing the soil extracted from digging the garden hole
The cellar was used from the noon till the afternoon during the summers	The temperature differences between the cellar and the outside which was usually 15° C cooler
So, the cellar could have been used for storing the food	The coldness of this section of the house prevents from the food stuff decaying
The steep sloping of the cellar steps	1-the entrance mouth was small,2-short length for the cellar for better controlling of the required temperature
The use of the colorful glass	1-aesthetic aspects,2-providing a coverage and reflection,3-repelling the insects through the use of multiple colors
The existence of patio	Supplying the inside with light, air ventilation and air chilling effect through constructing a pond underneath
The existence of dome-like roofs	Parts of the roof was shaded

Sash windows, the original wooden handmade artefacts, are a memorial of the old times and they are inspired by the original Islamic designs which are now outdated and they can only be found in the then houses, but they are still present in the entire Iranian territory in the old cities and villages. It can be said that sash window is a type of wooden sliding grid which is opened and closed via moving it up and down. It is usually of the height from the floor to the roof. Such a window is sometimes opened to the yard and sometimes to the porch and sometimes it is placed between two halls to be opened as required to provide for a larger hall. The sash window in Iranian architecture is applied as a fundamental opener has a very old background. Beautiful specimens of such windows can be seen all around Iran. By building the sash window in a grid network the architects intended to use it as a wooden window or orifice (figures 1 and 2).

Figure (1): Tabataba'ees House, source: the author/ Figure (2): sash window in Tabataba'ees House, source: Isfahan Cultural Heritage office

Study background:

Haghshenas and Fiabekloo in an article entitled "the survey of the colorful glass effect on the light intensity and the passing energy in visible spectral region" dealt with the study of a number of traditional sash windows and obtained the transferred visible region spectra for four different color glasses used in the sash windows by making use of a spectrophotometer and then discussed the relevant climatic and radiation issues. Purdeyhimi and Haji Seyyed Javadi also in another study entitled "the effect of the day light on the human beings" dealt with the study of the day light therapeutical effects, biological-therapy processes and its perceptual psychology. Nayebi and Kateb in their study entitled "the effect of the interior spaces light on the quality of life and the human beings' ethical behaviors in respect to the importance of the light in Iranian architecture and taking advantage of the natural light in designing and creating optimum spaces and the relationship between the environment with the body and soul health" did some researches.

Study methodology:

The study methodology in writing the current study has been a qualitative method and it has been conducted based on descriptive-analytical methodologies and the information required for the current study was acquired through library researches. The study has been generally organized as follows: firstly, a definition and identification of Tabataba'ees' House is presented and then the color and light psychological effects is introduced for the sash windows in Tabatabaees' house. After that, Tabatabaees' house which is a traditional and old house in the city of Kashan was selected for the study project since had been found to be of particular characteristics and then the sash windows in the house were analyzed in terms of color and light psychology and finally we deal with the investigation of such effects in the above cited house in the city of Kashan and the role of the sash window was consequently evaluated therein.

Study questions:

1. Do natural colorful lights have any positive effect on the improvement or prevention from psychological diseases?
2. Is there a way to contribute to the individuals' stress reduction through taking advantage of such methodologies?

Study hypothesis:

It seems that the use of the colorful glass can positively influence the human beings psychological and physical health.

It seems that applying the colorful glass in such a modern world as this one in the people's residential places can cause a reduction in the stresses and the anxieties resulting from the exterior environment.

The necessity to do research:

The objective of the current study is to find the best natural light colors spectra in the life environment including the work place, leisure time environment, education location, recreation resorts and so forth which can besides increasing the individuals' efficiency and productivity pave the way for the reduction in anxiety, improvement of the behavior and also the preservation and augmentation of the health status and their comfort and welfare level elevation.

Statement of the problem:

The sun light is an eternal source, clean, free of charge and in accord with the entire human beings' bioenvironmental and psychological aspects which can be benefited from perpetually and the increasingly wider use of such energy in the buildings during the recent decades is confirmatory of the aforementioned idea. The studies indicate that the light intensity, type of the light source and the way it is distributed in the various environments where the human beings perform their activities may influence their behaviors, temperaments, productivity and efficiency to a great extent. A window with colorful glass transfers the light with various and diverse colors. And it can prevent a considerable percentage of the hot and scorching rays from entering the interior spaces in a building and it can also

play a part as a light controller. Also, the colors emitted out of such windows can positively influence the individuals with psychological diseases. We deal with the prevalence of the psychological diseases and the lack of making use of the colorful glass in the buildings.

Sash window:

Sash window is a sliding-up window or door which moves vertically up or down and it is mostly opened to the yard (platform). The body of the sash window is made up of wood which is usually carved and lattice-like (Girih tiles) and it is usually built with variegated geometries mostly with plant-like shapes. Then colorful glasses are nested into these wooden reticular frameworks (4).

The specimen used in the current study is the sash window belonging to Tabataba'ees' House in which there has been exerted the least amount of interference in the structure and the composition of the glass colors and the color combinations and geometry of the wooden art works have been minimally changed in the repairing and restoring works and it has been tried to keep them unchanged to the maximum extent possible. In the studies performed on the existing sash windows it became evident that four main colors of red, yellow, blue and green are most predominantly applied (figure 3).

Figure (3): Tabataba'ees' House, source: the author

Sharden, the French voyager, travelled to Iran in Safavid era and meanwhile writing expositions about the houses and their decorations states that "the windows for the ordinary people's homes are made of sycamore tree wood but the windows for the aristocrats and the noblemen's homes is made of lattice-like wooden frames in each of the lattices there is installed and inserted a colorful small glass and these as a whole give birth to a beautiful figure... their window frames is either installed with glass or transparent plasters which also have beautiful shapes and figures carved on them and at the same time they let a lot of light to be passing through (5).

Madam Carla Serena has a section in her travel diaries in which she has written "Darvazeh Dowlat opens to a street... at the end of the street there is the King's palace.... the palace's entrance gate façade has been decorated with colorful glasses and it is exactly across from Darvazeh Dowlat" (6).

Color psychology:

The colors exert a great influence on the life so intangibly that we are rarely mindful of such effects. The scientists believe that the colors are absolutely influential on the human beings behaviors and characteristics. And this is in a manner that each organ of the body has been discovered to be in possession of its own specific energy and the colors are in connection to this energy in the human body. The colors effects on the human body, spirits and the human thinking style have been studied for years by the researchers. They say that the human tendency and attraction to a color is stemming from the feeling created in the person by a certain color. Colors are energies which are transferred through waves and the receptors in the human eye retina (cone cells) transform such energies to the perceptions of the colors in the human brain. The colors energies stimulate the pituitary and pineal (pea-like conical mass) glands in the brain. Through this stimulation, the above-mentioned glands secrete hormones which are effective on the human body physiology. And this can act as a factor relating the colors to the human physical and psychological moods. Chromo-therapy has been focused on by the researchers as a type of natural thrapeutical method. In 1942, the Russian scientists found out that red stimulates the sympathetic nerves and the colors white and blue cause an instigation of the parasympathetic nerves. The other studies have indicated that some colors stimulate hormone secretion and some others control or prevent the hormone secretion. In the following sections of the current study it was determined that the colors are effective on the treatment and/or exacerbation of the diseases (figures 4 and 5).

Figure (4): colors, source: Doroodi, 2012/ Figure (5): colors, source: (7)

Nowadays, the scientists believe that the mind responses differently to the various colors emitted by the light and we can treat sleeping disorders and the temperament and behavioral variations through taking advantage of such a finding. For instance, the waves of the colors such as dark white or purple can induce the human minds with hypnotic mood (sort of the brain tranquility) and they can also reduce stress and the chronic ailments. The studies have indicated that a color or a combination of the colors can be directly or indirectly effective on the treatment of the diseases (table 2).

Table 2: the effect of the colors on curing the diseases, source: Dorrodi with the author's emphasis

Color	Disease treatment
Red	Red is effective on the treatment of anemia, bronchial asthma, cold, constipation, bronchitis, tuberculosis and depression and it is not recommended when the individual is angry, has fever, hypertension and inflammation. For example the measles symptoms were found to be decreased when the individual was exposed to a window with red glass. Also, the patients with melancholia (type of depression) were found to be experiencing a better situation when hospitalized in rooms with windows nested with red glass.
Orange	Orange has been shown to be regulating the thyroid gland function, stimulates breathing and extends the lungs, and causes happiness and joy in the human beings. Orange is said to have anti-spasm (muscular contraction) effects and helps the food intake. Also, it has been found to be useful in treating the spleen, pancreas, stomach, intestine, kidney, lung, rheumatism, gout and depression.
Yellow	Yellow strengthens the mental power and intelligence. Yellow activates the nerve cells, augments the muscles strength and causes an increase in learning. It can be used in curing diabetes, constipation, eczema, digestive tract disorders, inflation, maldigestion, exhaustion, organs' numbness and depression.
Green	Green is the color of the nature. This color is growth balancer and tranquilizer, sedative and it is found to have calming effects on the human body and soul. It reduces hypertension and it has been found to be effective on the sleeping disorders, exhaustion and irritability. Through regulating the metabolism, yellow also spreads its effectiveness to weight control and it is considered as an important factor in treating the heart problems, headaches and ulcers. The color green possesses characteristics such as inducing the individual with decisiveness in performing and fulfilling tasks, perseverance, and endurance and it causes regeneration and youth and vitality and growth and it has an affective content which is accompanied with pride. The color green is the symbol of flexibility and determination and these are adjusted beside and in line with one another.
Blue	Blue is effective on the increase in hypertension and the throat problems. Blue has been discovered to be very efficient in curing the children's diseases and it combats the malignant effects of the diseases such as cataracts, chickenpox, cholera, insomnia, hysteresis, itchiness, and goiter and tonsil inflammations. When the person feels cold it is better not to make use of blue.

Also, from psychologists point of view, the different colors used in making such glasses and the creation of the same color lights passed through them variously influences the human beings and each color juxtaposed by the other one neutralizes the effect intensity and consequently an appropriate amount of each color is regulated and adjusted. Most of the colors used in the glasses installed in the sash windows are azure blue, red, green and yellow and each of them has been found to exert a unique psychological effect. Azure blue (dark blue) is considered as a biological need for the human beings, it psychologically signifies comfort and tranquility and physiologically it conveys satisfaction, to wit being satisfied with the situation and the comfort along with enjoying such a comfort and welfare. It creates a sense of sacrosanctity and pureness and produces a feeling of stability, integrity and safety. It is expressive of the truth, trust, love and devotion and sacrifice and it is a symbol of eternity, endlessness and it is a sign of sustainable values thus it is taken to be tending to eternalize the past. Red is expressive of the vital strength of the nervous system and glands activity therefore it is intended to mean wishes and the entire forms of willingness and desires. Red means acquiring the interested results and achieving accomplishment. Red is a symbol of wishfulness for the entire things encompassing the life intensity and the maximum extent of experience. Red is a motivation for

intensifying activity, sports, struggling, competing. Red bears the meaning of being willed and having volition whereas yellow brings happiness and light. Yellow has characteristics including light, reflection, shining quality and transient happiness. Yellow is indicative of wishing to develop invincibly, easy-goingness or the tranquility within. Yellow is in the opposite end to green. It means stressing accumulation of the green can even lead to pressure and convulsion, while yellow is assertive of the calmness and exhilaration. On the other hand, yellow green has a lower concentration and it is lighter than the red, thus instead of being stimulating and acting as an incentive it is more of a blending and pooling effect.

One of the important theoreticians in the field of colors effects is Johann Wolfgang Goethe. He believes that "the colors are the mysterious mirrors of the entire human beings processes and each color has a special sensory-psychological on the human beings.

Machi Lucher, the famous psychologist, has indicated that through surveying the interests everyone has to special colors we can determine their psychological disorders quality and then they can be manipulated in terms of their attitudes and cognitions.

In the modern psychology, the colors are enumerated as one of the personality assessment scales; because each color has been found to be connected to certain effect on the individual's soul and body and it is said to be expressive of the individual's psychological and physical status. From long ago, the human beings have been subject to the influence of the colors in their periphery and during the recent one hundred and several years, during which the paint manufacturing industry has reached to its peak evolution, the colors effects have doubled and the colors have penetrated into every aspect of the human life. Such an increasingly higher and more accentuated use of the colors has brought about the grounding for the color psychology. The colors are replete with highly extraordinary forces, forces that influence their onlookers like energetic and pyrogenic nucleus. And disregarding the negative or positive effects they have on the human subconscious ego, the creative artist should not only attempt to take a journey to the indefinitely extremeness of the color world and to pile up whatever scientific experience s/he he can, but it is also necessary for the color concepts to be identified and recognized in every respect. But the most important of such aspects upon which the colors aesthetic concepts credibility is laid is the recognition of the colors as one of the most prominent configuration factors and then the power of the color in establishing a relationship which should be known to the artists and everyone.

Ergonomics application of the colors:

Colors are an integral part of the life. The effect of the color on the human life transcends beyond the hedges of the human mind and only a trivial amount of the colors effects can be observed in the human spirit, work, tiredness, incidents, art and perceptions. According to the great many of the effects color have on various systems and their role in designing and developing the human systems, ergonomics and the study of the colors features, its effects on the human beings and his psychology and the colors perceptions and the related analysis seem to be required for the industrial engineers and the industry-service system designers. The research conducted by the scientists indicates that the way the colors influence the human body and soul they are also effective on the human physique. Some of the researchers believe that the color which is selected by an individual and is his or her favorite can be expressive of the person's psychological and moral characteristics.

The colors effects on our perceptions:

As we know, the colors influence the human beings' temperaments and feeling, and it is this effect that has been taken advantage of for the purpose of increasing the workers' productivity in the industries. There are numerous efforts spent in line with this idea in order to make use of the attractive colors, proportionate to the extant environments, environment lighting systems and the type of the job.

The following table explains the quality of the colors' effects on our perceptions of the environment (table3).

Table 3: the effect of the colors on our perceptions, source: (8)

The color effect on the objects' size	The green and blue objects look bigger than the yellow and red ones
The color effect in the objects distances	Green and blue surfaces look farther, yellow and red surfaces look closer
The color effect on the objects flexibility	The colors with short wavelength (purple, blue, green) give us an even image of the objects. The colors with long wavelength (yellow, red) cause feelings of softness and flexibility
The color effect on the objects temperature	Red and yellow are among the warm colors, green and blue are among the cold colors
The color effect on the objects hardness	Red, white are among the hard colors, blue, green and black are among the soft colors
The color effect on the objects' weights	The objects with light colors look lighter

The effect of colors in the human beings:

The color is a strong factor which can be stimulating or tranquilizing, cause a feeling of coldness or warmness and make a person irritated or joyful. The colors favored by the individuals can reveal numerous secrets about them. Experiencing the color energies emitted by different colors can explicitly exert a visual-sensational effect on us. Colors can revolutionarily change our periphery and they can increase our creativities, By the help of the colors, an individual can bring about the conditions for elevating his or her self-awareness and be changed to a lively and active human being (figure 6).

Figure (6): the color effect on the human environments, source: (7)

The physical impact of the colorful glass on the space:

The colorful glasses used in the sash windows cause the officious insects to be repelled and stay away from the interiors of the house through generating colorful lights and this can be considered as one of the most important characteristics defined for such sash windows (9).
Also, the colorful glass per se can act as decorative and ornamental curtains for the interior spaces with the difference that it is not perceived as being added and appended (figure 7).

Figure 7: sash window, source: Isfahan cultural heritage

The effect of the colors used in Tabataba'ees' House sash window on the individuals has been illustrated in table 4.

Table 4: the effect of the colors in Tabataba'ees' House Sash window, source: Surtiji, with the author's emphasis

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The spiritual effects of the colorful glasses in the space:

In our traditional art and architecture, the principle of spatial unity (the principle of deducing unity out of plurality) is the most fundamental principle considered by many of the researchers. The principle is reminding of metaphysical and philosophical aspects of architecture which is manifested within the space (11).

When the sun light is radiated to the sash window it is transformed into various colors and it renders the space colorful this is while the light is transmitted only from one source but it is manifested with various forms and colors and the principle of the unity within plurality and the plurality while being uniform is

flowing in such an idea. This very issue causes the human being t be granted with safety and imagination and then he can be overflowing with the philosophical and theosophical thoughts. The carvings on the sash windows were completely explained at this point, but there are also a myriad of such traits seem to be left untold that is because such an elements and its components are so much interlaced that in combination with the general and detailed spatial characteristics of the house they can serve plenty of roles. In fact, sash window is a miraculous festival of the nature, technology, math, art and theosophy; on the one hand, the wood and glass and paper and gypsum and the colorful chromes and also the techniques such as Girih tiles and arabesque traceries and wooden artworks and matrices, lattice works and carpentry and, on the other hand, theosophical and philosophical thoughts have been working together to be presenting such a beautiful festival to the human beings and that be the human being who is floating in his peak of the presence in the society and daily life to find himself a solitude lifer who hunts the musk deer from the Khotan deserts.

Supplying light:

Supplying the light is one of the most important functions of the windows since no lightless space for the human living can be deemed as appropriate and endurable. The amount of the light required for every space depends on various factors such as function, situation, depth and elevation of the space. In the past the windows' light absorbing surface sizes used to be selected based on the aforementioned factors and they were chosen in a way that sufficient light could be provided to be passed through to the maximum extent possible (12) (figure 8).

Light is the source of the entire universe livelihood. When it hits the surfaces of the objects it gives them form and shape and with accumulating shade behind the objects it gives them depth. The beauty that pats the eyes should be thankful to the light and luminosity, otherwise, in the darkness beauty has no meaning.

Figure (8): Tabataba'ees' House sash window, source: Isfahan cultural heritage office

Light is an active factor in introducing the space. Also the light is capable of giving the space a visual expansion. It is the primary condition for visual perceptions. In the absolute darkness we cannot see the space nor the forms or the shapes. But, the light is not the only physical necessity; rather it is more of a psychological value which makes it one of the most important factors of life in every respect. The way the objects are manifested in contrast with the light makes them more highlighted or less highlighted.

Apart from the role the light plays in illuminating the buildings' interior sections it is also important regarding the architectural decorations and ornamentations and due to the fact that the ornamentation and decoration have been, and are, a manifestation of the luminosity and happiness in the entire eras of the Iranian architecture, the Iranian artist makes use of elements in his ornamentation and decoration which can practically best implement his thoughts of lighting and illumination; among such ornamentations is the use of ornamented vaulting which is applied to absorb and disperse the light in precise and narrow degrees and quality in controlling the light. The use of colors in the building is particularly effective on the building illumination and it is through the balance and the coordination of the colors that we can figure out the role and the standpoint of the colors in the illumination and the glassiness. Also, the use of the windows with colorful glass will be of a great help to the actualization of such an objective by the architect (13).

Color psychology:

The quality of dealing with the lighting system implementation in the interior building spaces exerts a considerable psychological effect on the individuals' eyesight and looks within a built environment. It is clearly obvious that the sufficient and appropriate light has no other effect than strengthening one's

spirit and the otherwise can also be held true. Maybe you have had experiences of how the insufficient lighting has adversely and unpleasantly influenced your feelings when making use of a space. For instance, the rooms facing the sun tend to take in greater light and provide the residents with pleasant, warm and happy spaces which cause them to feel agreeable. This is while the rooms which are exposed to direct sun light tend to have tiring, dull and cold spaces and cause the residents to feel depression and nostalgia. On sunny days during which the sunlight creates black and white visual effects the individuals turn out to be more active and energetic. Conversely, on misty and cloudy days when there is no black and white effect present the space looks stagnant, dull and boring. The differences between the two days can be found out in the quality of light (14) (figure 9).

Figure (9): Sash window, source: Isfahan cultural heritage office

Sash window as the skylight:

Such windows cause the sunlight to be passed through in sufficient amount into the room space, not so much intensified and not so much less intensified. As we know, all of us are born of light. The sunlight gives life t our planet and the vigor of the light beauty is so important in our lives that we metaphorically make use of expressions related to the light in our daily life without thinking about them. Light conceptually conveys the meaning of happiness or easy-goingness, agility or lightness and it has never meant to be semantically taken as darkness, depression, unpleasantness and sedentariness and it can be said to be inhibiting all such negative characteristics. The light is the difference between the life and death. The light changes our world and it has exposed our lives to revolution and change. Light has changed greatly our universal perspective, our good and bad beliefs and also our religions and finally it can be said that light is the basis and foundation of our perspectives spirits and it is the missing part of our everyday life. The shining sunlight is the source of our lives and it causes the human beings to stay healthy. The lack of the sun light exposure (deficiency in vitamin D) causes softness of the bones (Osteomalacia) in children. Also, it is noteworthy that according to the medical experiences the light can bring about the grounding for the treatment of depression (light therapy) in some patients. The presence of the light and the lack of it influences every minute of our lives. The way we grow and mature, our health, sleeping, eating, our relations and even our habits and propensities and finally our life length are subject to the amount of the light we receive. Of course, it has to be mentioned that the excessive light also can be a cause of disadvantages such as skin cancer and the shortage in our bodies' water reservoir and so forth; in the Iranian traditional architecture all these advantages and disadvantages have been taken into consideration and we can control the amount of the light entering an interior section of the building through building and taking advantage of such windows. The sunlight is comprised of a rainbow of colors and also the sash windows transform the single-color sunlight to various colors inside the interior parts of the rooms through the use of colorful glasses more like an earthly rainbow and they generate a beautiful and enchanting vista (figure 10).

Figure (10): Sash window, source: the author

The therapeutical effects of the daylight:
The studies indicate that the daylight radiations can have positive therapeutical effects on the patients who are recognized to be suffering from the seasonal affective disorder. Such patients feel depressed during winter, find themselves diminished of their energy and physical potential (15).
From another perspective, whenever making use of the light is performed according o the considerations regarding the diagram (1), then

Diagram (1): daylight considerations, source: LRC, 1996
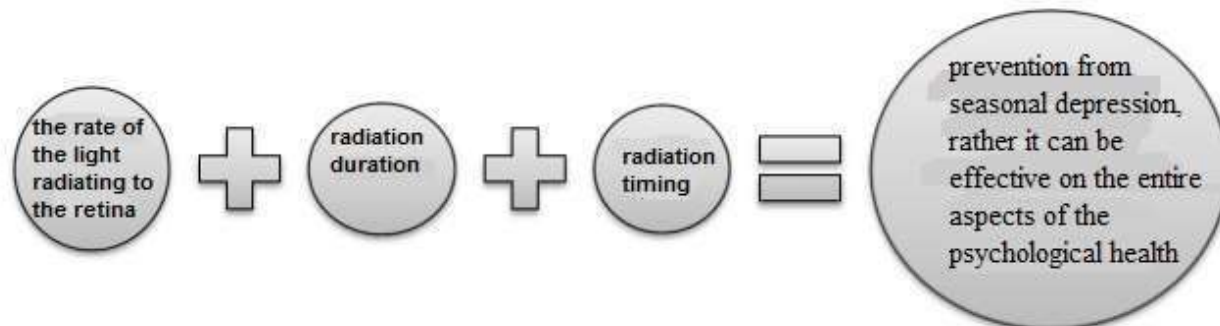
In the studies performed regarding the light biology, the daylight luminosity is one of the most important environmental elements on the human body and the human being today through taking advantage of the results obtained in the plethora of the studies carried out in this regard can take into consideration the light-therapy as the best option in curing many of the psychological disorders (Poordeihimi) (figure 11).

Figure (11): Tabataba'ees' House, source: the author

Light and depression treatment:
The clinical research indicates the similar effect of the light and the antidepressant drugs on the treatment of the depression special seasonal affective disorder. Therefore, the patients choose light therapy as the first choice of interest in treating depression (16). Nowadays, the positive effect of the appropriate light on the human psychology, behavior and propensities, invigorating and generating positive energy cannot be denied, since it has been found that the light directly influences the intra-brain sections and the desire and interest in the luminosity and fear of the dark are not baseless psychological or social invalid presumptions. Rather, the optimized light effectiveness on the human psychological health and the effect it has on the change in the human temperament and behavior and finally the human beings' qualitative behavioral enhancement have all been approved in various research projects (17).

Guiding appropriate light to the interiors and reducing the sun radiant energy flux intensity:
In hot and dry climates, the sun radiation angle is too much and the number of the sunny days is too many, to prevent from the too much sun to enter and cause too much heat the opening sections aspects should be made as small as possible and the elevations from the ground level should be heightened. But such a solution does not seem to provide sufficient light for carrying out the routine activities. The Iranian architect transfers a sufficient amount of light to the interior of the building through the use of sash window and by taking advantage of beautiful Girih tiles and by making use of the sun light fractionation and also by taking advantage of the wood which possesses a low heat transfer coefficient the amount and the intensity of the heat transfer is reduced (18) (figure 12).

Figure (12): sash window, source: the author

Spatial diversification (from psychological aspects):
There are commonly used four colorful glasses in the frameworks of the sash windows. Such colorful glasses influence the human beings differently and it is in a manner that each color in juxtaposition with another color neutralizes the intensity of the other colors and therefore an appropriate amount of each color is regulated and adjusted (9). These four colors are yellow, blue, green and red. Azure blue induces the person with tranquility, safety and satisfaction of the current situation. In the contrary, the red corroborates the senses of volition, victory, intensive activity, desire for progress and excitement. Green

induces the individual with feelings of endurance, growth and pride and finally yellow has been found to be connected to such feelings as tranquility and easy-goingness. During various hours of a day, with the change in the color spectra various psychological spaces are created which exert considerable effects on the individuals (figure 13).

Figure (13): Tabataba'ees' House sash window, source: the author

This multifunctional window serves as a light reflector which radiates the colors on various surfaces and also causes the users' spirit to enhance under various circumstances besides softening of the colors and getting them entered to the interior spaces of the building. The sash windows surface was used to be ornamented and decorated with the use of different and variegated carvings of Girih tiles and with colorful and simply plain glasses and by doing so innovative combinations are resulted and this way the disharmony between the geometrical lattice-like structures and the colorful lights generate a sort of agreeable beauty. Proportionate workings between the sash window (light geometrical order) and the color, as proposed by Ibn Heytham, are the two of the three superior elements which seem to be possessing the greatest capability in creating visual aesthetic effects and they are intensively dependent on the third element which is the light and the light is the ultimate source of the visual beauty which is the prerequisite for the individual to be able to see and also it has been expressed by him that the color per se can add another beauty to the light beauty and prettiness.

Because the radiating colors are pleasant and pat the spectators' eyes, when the colorful designs and the colorful glasses are organized proportionately and symmetrically their value of beauty increases considerably. That is because when the shining and lean designs and colors enjoy a normative and even order are perceived better rather than being disordered and such a beauty and order ripens with the very geometrical Girih tiles.

The effect of the light on the Islamic architecture is undeniable and it is of a considerable importance and expanded semantics. The role of the light in the Islamic architecture puts a very high stress on the manifestation principle. The role of the light is to clarify the matter and it has also been considered as reducing the buildings' coldness and harshness. The light is diffused into the interior spaces of a mosque as a manifestation of existence to be considered as one of the constituent elements of the perceived space. In fact, the light grants the Islamic decorations with agility and vitality and it guides the human beings to an imaginative world instead of distracting the mind to wander around in search of it. If we believe that Iranian architecture is a truth-seeking architecture, so the truth that should be sought for by the architecture is in perfection and the perfection should only be looked for before the one God almighty and the more it is present in such an architecture the more it is perceived as a part integrated to it and it is, as well, moving in the direction to search for and reach such a perfection. Light is a sign of movement towards the truth and it is devoid of any physical or material state and such a fact is discussed along with the other factors including climate and the building's placement locality and the way the light is applied. In the architecture of the contemporary buildings the light is entered directly to the buildings' interior spaces; this is in conflict with the spiritual purity. With such an attitude and mindset, the light is directly present in the architecture, this is while in the Iranian architecture the light has always been adjusted and this is insured through the architectural constituent elements such as orifices, skylights, Goljams and the colorful glasses and sash windows. The natural light has always been an orientation determination factor in the traditional architecture and it has been allowed to enter the buildings from certain given directions, whereas with the tangible changes that have occurred in the human attitude their look at the skies as a supernatural space has been transformed to a physical and material principle and the light has been taken advantage of as a practically applied element. Therefore, the use of the light in the modern space has become devoid of its secretive semantics. In other words,

"the light brings about convergence in the traditional architecture and it causes divergence in the modern architecture."

Conclusion:

The knowledge of the environmental psychology is the common area of interest between the behavioral sciences and the architecture which has emerged through the coalition of the two above fields of study subsequent to the world war and after dissatisfactions aroused in the people of the modern architecture spaces in which the human beings immaterial motivations and the needs were disrespected and the main objective pursued by such a field of study was the in situ study of the human beings.

In the present era, the color has been studied in various sciences and from different perspectives. Aspects such as light and color physics, colors chemical structures, color sociology, color study of symbols, color in visual arts, the semiotics concepts and approaches, mythology and the colors spirituality, treatment and curing of the patients by means of the colors or natural resources, chromatology and finally the psychological and personality aspects on the human beings. In modern psychology, the color and colors are one of the scales of the personality assessment, because each color exerts certain effect in the human beings both physically and psychologically and the colors are suggestive of a psychological and physical state. This knowledge has been justified according to the progresses made in both of the physiology and psychology fields.

In different architectural eras with their own unique architectural styles, the light was utilized aiming at a specific and defined objective. The trend which is currently pursued by the contemporary architecture is gradually moving towards a direction in which the light loses its spiritual and sensational stance. This is the architect's duty to make use of the light and shade, illumination and darkness, the orifices in the buildings' walls and so many other elements in such a manner that they are not hindering the daily activities. Furthermore, they should be providing the users of the buildings with a pleasant feeling. The light is the most transparent, softest, the easiest and the cheapest extant structural material in producing the qualities and the objects required by the human being and it is a thing that provides the grounding for the personality development and vitalizing the daily activities and representing the life in the various imaginations and moods. The light not only plays a significant role in valuation of the architectural elements it is also one of the important factors determining and delineating the space. The light has many effects on variegating the spatial and textural nature of the things.

What is indicated by the historical studies is that the human beings have always been subject to the color effects during their lives and these effects have been intensified with the progresses made possible in the color industry during the recent century. According to the characteristics and attributes mentioned regarding the colors one can get to know the effects of the colors on the individuals' behavior and also spirits. The reason behind taking advantage of the colorful glasses in the past has been for the sole reason of the effects the colors have on the human beings psychologically and the old architecture had been well aware of the idea. They used yellow, blue, red and green in the sash windows. Because yellow is a happy color which enhances the feeling of healthiness and increases the human efficiency, blue is a tranquilizing color which has pacifying effects and it can induce sleep. Red is a stimulating and dynamic color and wherever it is used it corroborates the activity vigor, green is a harmonic color and it reminds us of the nature and all in all it is a warm and delighting color. According to such studies, the use of the colorful lights and/or colorful glasses which enter the colorful lights into the buildings has numerous positive effects on the human personality and behavior and spirits. By taking advantage of the appropriate colors we can handle the treatment of the diseases including stress and anxiety resulting from the modern life, treating the seasonal affective disorder and psychological diseases.

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ARTICLE

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN EMOTIONAL INTELLIGENCE OF MANAGERS AND CONFLICT MANAGEMENT WITH MEDIATING ROLE OF POLITICAL INTELLIGENCE (CASE STUDY: BANDAR ABBAS OIL REFINING COMPANY)

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ABSTRACT

Background: The present study objective is to investigate the relationship between emotional intelligence of managers and conflict management with mediating role of political intelligence. **Method***s: The population of the study is managers of Bandar Abbas Oil Refining Company (108 managers) and after data collection through standard questionnaire, they were analyzed. The reliability of questionnaire was confirmed by Cronbach's alpha coefficient and its content and face validities were confirmed by utilizing the views of professors and experts in the field. Also, model and hypotheses were analyzed and fit-evaluated using AMOS structural equations software. **Results:** The results show that emotional intelligence of managers accompanied with political intelligence has positive effect on conflict management. Finally, the mediating role of political intelligence is confirmed in the relation between emotional intelligence and conflict management.*

INTRODUCTION

Among issues challenging an organization is the problem of conflict and lack of agreements. Organizational activities require interaction among people and groups of organization. In organizations, various people are occupied with their tasks and activities in different ranks. Bilateral or multilateral relations of people with each other are necessary to carry out these activities, but it also can make the ground for conflict. Therefore, one of the main and the most inevitable issues in organizations is conflict among people and groups available among them [1]. In organizational life, conflict is in relation with power and politics. Conflict might be created among people and groups and it often commence with political behavior. Conflict will be created especially when members of a group think their attempts to achieve their goals are being neutralized by another group [2].

One of the most important factors indicating ability of manager to solve conflict effectively is his emotional intelligence. Contrary to what was thought in past and cognitional intelligence was the only help to success, nowadays, emotional intelligence is a factor determining people's success in life and career [3]. The people with high emotional intelligence experience less emotional disorders due to their ability to interpret efficiently and organize emotional states of themselves and others [4]. What is called emotional intelligence is in fact the main source of energy, power, wish and desire of human and it activates the most internal values and goals of a person. Through emotional development, a person learns to confirm emotions of him and others; value them; and respond to them appropriately. He also understands at any moment during a day that emotions prepare profitable and vital information for him. This reaction is from heart that sparks creative genius and intuition. In addition, it makes the person honest with himself; makes confidant relations; clarifies important decisions; prepares an internal compass for life and career; and guides the person in unexpected events and successful solutions [5]. Researches show that conflict resolution in organizations need to create a peaceful environment, reduce discrimination and make justice, cooperative learning, violence prevention and critical thinking. Managers who have such a high emotional intelligence are able to create such environments. A manager with high emotional intelligence can get more information about the conflict, and therefore, can identify conflict faster and more accurately. He is also able to make useful guidance with empathy and confidence, thereby provide an environment where staffs can have more mental health. Because by having healthy relation, people feel acceptance, support, value, confidence and more importance. Therefore, their mental health will be prepared and their efficiency and effectiveness will be increased. In such environment, effective management of conflict is possible. Furthermore, another factor to resolve the conflict in addition to preventing mentality intervention in organizational communications and accepting opinions of others is the manager having communication skills [6]. If a manager can be a good speaker and a good transmitter, a good listener and a good receiver, he can provide participation of individuals inside and outside the organization through attracting comprehensive trust. As a result, success of organization to achieve its goals is guaranteed. Political behaviors in modern organizations are inevitable and cannot be removed. But, through applying political intelligence, their effects can be minimized. According to many theorists, political skill has an important role in predicting effectiveness of managers. They know structure of political skill as the best suited and potentially the most useful predictor of effect of manager at the workplace

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where he is handling its political liability. Political skill is essential in many organizations as an important feature for competence and career success. Although organizations have not known political skills accurately and have not seen it so, they have selected and promoted people in accordance with this feature. According to Spenser and Spenser, managers with more developed political skill are known as more effective managers. Studies have shown that emotional intelligence has an important impact on social adjustment [7], as the emotional intelligence training is effective on social adjustment and development of communication skills [8]. Moreover, capability of emotional intelligence can develop personal function through solving conflicts and confronting with mental pressures and facilitating communication with others [9]. As political intelligence can help achieving flexibility and decreasing conflicts during the process of change, therefore, the present study reviews the relationship between emotional intelligence, political intelligence and conflict management.

RESEARCH'S LITRATURE

Political skills (political intelligence)

Political skill is a separate form of social skill that aims to achieve success and goals in both individual and organizational levels. This skill can happen out of territory of organization, but its purpose is penetration and organizational success [10]. Three decades ago, Pfeffer (1987) was the first person who used the term "political skill" in organizations. Pherri et al (1999) did an independent, parallel and shared work with the research conducted by Mintzberg (1983)[11]. Mintzberg introduced political skill as the required competence for job success and stated political skill as: The ability to effectively understand others at work and apply this knowledge to influence others to move in paths that promote personal or organizational objectives. In this regard, Kelli Ford has recently defined political skill as: The ability to effectively understand others at work and apply this knowledge to influence others to act in such a way that promotes organizational and/ or individual goals. Although this skill is not urgent for career, it is promoted for function and survival in today's complex and dynamic organizations [12].

Political skill of managers has 4 dimensions:

1-Social consciousness, 2- Interpersonal penetration skill, 3- Networking skills, 4- Obvious Honesty skills

Social consciousness (acuity): refers to the ability of people for thorough understanding of social situations including their own behaviors and others' behaviors [13]. People with social acuity are able to interpret others' manners, comprehend social situations and apply creativity in their relations with others. This form of political skill will effect on ability of staffs for evaluation of the best time and method to start change [12]. Such people are keen observers of their social environment, and comprehend not only complexities surrounding them, but also motivations of their own and others [11].

Interpersonal penetration skill: refers to ability of people with political skill to influence on those who do interact with them [13]. They know the ability to negotiate in others as an inherent feature of political skills [14]. They are humble and convincing that conceptually is similar to the term 'flexibility' used by Pfeffer (1992) which is an ability of people's adaptability [12]. These people use a keen convincing style to influence on others [15].

Networking skill: as one of the dimensions of political dimension refers to the fact that political people are skilled in making communication, friendship and alliances. This ability creates 'social capital' that facilitates people with more resources in order to achieve their objectives [13]. People who have a high political skill identify those who have profitable resources or communications and create social networks [15]. Consequently, they will have social capital and social support [13]. Moreover, skillful political people are able to effectively manage conflicts and negotiations that enhance the probability of making strong communication between them and others [11].

Obvious Honesty skills: refers to having validity, honesty and persistency. People having obvious honesty attract more trust and support of colleagues when challenging penetration attempts [16]. Among the four dimensions of political skill, obvious honesty pays attention to successful penetration potential in the best way [15]. Through having self- confidence and personal safety, it attracts others and induces them relief. People who have skill politically not only know accurately what to do in various social situations, but also know how to do them to conceal any self- service motivation and their works are interpreted as original and honest [18] [12].

Emotional intelligence

Among the new achievements with the origins of psychology that has been recently proposed in the field of management is the topic of emotional intelligence. During the last decades, the concept of emotional intelligence has been introduced increasingly in theoretical background and psychological researches as a structure that is related with various human behaviors in various environments. The term' emotional intelligence' was proposed by Daniel Goleman in 1995 and provoked many discussions [19]. In Salvvy's point of view, emotional intelligence includes controlling feelings and emotions the person himself and others, arranging them and using the information based on emotion to guide thinking and action. A more complete definition of emotional intelligence in Salvvy's idea is: the ability of comprehension, evaluation, correct expression of emotions, the ability to access and generate emotions to facilitate cognitive activities, the ability to understand the feelings and use of language related to emotions, the ability to regulate emotions of oneself and others to achieve growth, good mood and effective social communication [20].

Emotional intelligence includes ability of awareness of the emotions and using them to improve the quality of personal and social life. According to Peter Salvvy and John Mayer, emotional intelligence is a type of

emotional processing that includes correct evaluation of feeling in oneself and others. Dr. Daniel Goleman knows emotional intelligence as abilities to help a person keep his motives; endure in the face of difficulties and frustration and controls himself and be relaxed in critical condition and challenges ;and empathize with others and be hopeful [21]. Mayer et al concluded that emotional intelligence has four important components. First, emotional intelligence includes the ability of evaluation of emotions both verbally and non-verbally. For instance, people who have emotional intelligence are more skillful in accurate recognition of emotional states appearing on the faces of people. This ability is considered as an important issue for occupations in which evaluating clients and customers' emotions is vital in order to have an effective communication with them. Second, emotional intelligence also has the power of adapting affects with cognitive processes and training. Therefore, people having such intelligence have more flexibility when planning for making more creative solutions and guiding attentions and motivations (for example distracting emotions from less important issues to more important priorities). Third, emotional intelligence includes the ability of understanding emotions and arguing about them. A person who has higher level of emotional intelligence has a higher capability of understanding. For example, they understand how these emotions go through one person to another. Finally, emotional intelligence includes the ability of organizing and managing emotion in the person himself and in others [4].

In Siberia Schering's idea (1986), emotional intelligence includes components such as empathy, self-regulations, self-awareness and social skills or relations management. Schering called ability to see things from others' perspective as empathy; optimal use of emotions and motivation to achieve goals as self-motivation; managing emotions as self- regulation; being aware of emotions as self-awareness; and ability to manage relationships with oneself and others as relationship management. People who have high social skills or, in the other word, relationship management can easily guide intellectual and behavioral path of others to the direction that they want [22].

Conflict

If collaboration and good social behaviors are at one end of a continuum that describes how individuals and groups work together in the organization, on the other end, there is absolutely conflict. This term has various meanings and has been used to refer to events ranging from internal anxieties due to competitive needs and demands (internal conflict) to inter- country violence (war) [23]. In organizational behavior domain, conflict mainly refers to cases in which units or people in an organization work against each other instead of working with each other. Webster dictionary defines conflict as (a fight and disagreement of the opposing forces and conflict between of instinct or the ethics and religious and moral ideals0 [24]. Robins believes that conflict is a process in which the first person attempts intentionally to prevent the failure of the second person to achieve his interests and goals [2].

According to a comprehensive and accepted definition, conflict is a process through which a group understands that another group has carried out some actions or is carrying out that has negative influences on its demands [25]. In the other term, it seems that key elements of conflict include:

Conflicting interests between individuals or groups; 2) identification of such conflicts among interests; 3) a belief in the principle that each party will neutralize interests of the other (or already has), 4) actions that actually bring such effects.

Despite various definitions about conflict, some subjects underlie all forms of them. First, both parties must comprehend conflict. Second, presence or absence of conflict depends on the perception of people and if none of parties are aware of conflict, there is a general agreement that conflict does not exist [26].

The first level: potential disagreements: in conflict process, the first level is presence of conditions that provide the ground for conflict. The conditions must not necessarily end up with conflict, but presence of at least one of them is required for creation of conflict.

The second level: the conflict indication: if the mentioned conditions in the first level make frustration, in the second level, the ground for activation of disagreements is provided. These conditions lead to conflict just when some groups are exposed to the phenomenon of conflict.

The third level: intention or purpose: intention or purpose of doing an action means a gap between thought and feeling of a person on one hand, and his obvious behavior, on the other hand. Here, intention or purpose means decision to do an action in a determined manner.

The fourth level: behavior: the level of behavior includes indication of disagreement, action and reaction that involved and opposite parties show. Each of involved parties (that is opposite of the other) try to carry out some obvious actions in this level.

The fifth level: results: these results can be either constructive, meaning that conflict has led to improved performance of group, or destructive that will destroy the function of group [27].

Structural strategies for conflict management

Emphasis on the main purposes: the main purposes are common goals which are considered by conflicting sectors. They are more important than personal or the part that conflict is based on it.

Conflict reduction: another solution to minimize undesirable conflict is reduction of differences that makes the conflict at the first place.

Improvement of communication and perception: communication is vital for effective conflict management. Communication can vary from accumulation between employees who rarely see each other to the formal processes in which differences are identified and discussed.

Reduction of duties dependence: conflict increases with the level of dependence. Therefore, minimizing undesirable conflict might include reduction of level of dependence between sections.

Increasing resources: one obvious way to reduce conflict that has occurred due to lack of resources is increasing the available resources.

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Clarity and transparency of rules and procedures: some conflicts are made due to ambiguous rules of decision making for rare resources allocations. As a result, these conflicts can always be minimized by making rules and strategies [26].

Malek [28] has reviewed the correlation between emotional intelligence with conflict management strategies and has concluded that emotional intelligence has a positive and significant relation with solution-oriented strategy. About using emotional intelligence in predicting the use of conflict management among nurses, Jordan and Troth [29] showed that there is a relation between emotional intelligence and using solution- oriented strategy and co-operation. Steve Larngon [30] has concluded in his studies that there is a positive and significant relation between emotional intelligence with profitability of organization, satisfaction of customers and staffs. In a review of the relation between emotional intelligence with conflict management strategies of managers, Keramati et al [31] showed that there is a positive and significant relation between emotional intelligence with solution- oriented strategies. This finding means that by increasing emotional intelligence, using solution- oriented strategies increases rather than control strategy and lack of confrontation. Casey and Casey [32] showed in their studies that increased self-esteem and emotional self-awareness component can strengthen the skills of conflict management. Finding of a field study, Taboli [33], shows that emotional intelligence is effective on political skill of managers and vice versa. But emotional intelligence has more effect on political skill, on one hand, and emotional intelligence and political skill of managers are effective on job satisfaction of staffs, on the other.

Research's hypotheses

According to what has been stated, the following hypotheses are represented:

Hypothesis 1- emotional intelligence of managers is effective on conflict management

Hypothesis 2- emotional intelligence of managers is effective on their political intelligence

Hypothesis 3- political intelligence is effective on conflict management of managers

Hypothesis 4- political intelligence plays a mediating role between emotional intelligence and their conflict management.

MATERIALS AND METHODS

Population of this study is 148 managers of Bandar Abbas Oil Refining Company among which 108 in various ranks were selected according to Morgan's table.

Evaluation tools and statistical techniques:

The data related to political skill are collected by using the translation of Ferris's political skills inventory [34], including 40 questions in the form of 5- item Likert scale. The data about conflict management are gathered by Robins' conflict management questionnaire [35] including 30 questions. In order to evaluate the level of emotional intelligence in managers, Wong's Emotional Intelligence Scale [36] with 40 questions is used. One of the strongest and most appropriate methods of analysis in behavioral science and social science is multivariate analysis. Because nature of such subjects is multivariate and cannot be analyzed by bi-variable methods (that each time an independent variable is considered with a dependent variable). Multivariate analysis refers to a series of analysis methods that their main feature is simultaneous analysis of K of independent variables and N of the dependent variable. Analysis of covariance structures or causal modeling or structural equation modeling is one of the main analysis methods of complicated structural analysis. Therefore, as in the present study, there are some independent variables that their effect on dependent variable must be reviewed, using structural equations model seems urgent.

The findings:

Table 1: correlation coefficients of variables

		Political intelligence	Conflict management
Emotional intelligence	Correlation value	0.45	0.35
	Significance number	0.02	0.000
Conflict management	Correlation value	0.22	1
	Significance number	0.01	0.000

As it is clear in [table 1], according to the level of significance (0/000 and 0/02), being lower than significance level (0/02, 0/00<0/05), presence of a sort of significant relation between factors is confirmed. There is a linear relation between emotional intelligence and both factors of conflict management and political intelligence. Also, there is a direct linear relation between political intelligence with conflict management.

As [table 2] shows, findings are indicative of fitness of RMSEA index. The value of RMSEA equals to 0/078. The permitted value is 0/08. According to LISERL output, the calculated value of $\chi 2$ equals to 1058, 97 that rather than freedom degree of 485, it is less than 3 and as P-value is not significant, so it indicates

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the appropriate fit of chi-square. GFI, AGFI, NFI indexes are 0, 91,0,93,0,95 respectively, that show a completely high fit.

Table 2: fit indexes of model

NFI	AGFI	GFI	p- value	RMSEA	X^2/df	df
0.95	0.93	0.91	0.107	0.074	2.28	485
More than 0,9	More than 0,9	More than 0,9	More than 0,5	Less than0,05	Less than 3	more than zero

Hypotheses testing

In order to review all the hypotheses of this study, first, we calculate path coefficient. Analysis of the regression methods development and in fact, the use of multivariate regression is in relation to the formulation of clear causal models. Its objective is to achieve quantitative estimates of causal relationships between a set of structures [37]. In path analysis, the relations between variables flow in a direction and are considered distinct paths.
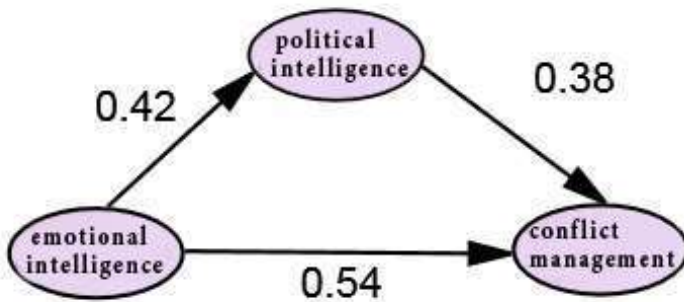
The results of hypotheses being accepted or denied are shown in [table 3].

Table 3 : examining the hypotheses being accepted or denied

Hypotheses	Effect value			Significance of direct effect	Confirm/deny
	Direct effect	Indirect effect	Total effect		
Emotional intelligence is effective on political intelligence of managers	0.42	--	0.42	5.46	confirm
political intelligence is effective on conflict management of managers	0.38	--	0.38	3.92	confirm
Emotional intelligence is effective on conflict management of managers	0.54	0.42*0.38	0.69	3.21	confirm

The results of this test show that the variables of political intelligence, emotional intelligence effect on their conflict management. On the other side, the variable of political intelligence plays the mediating role of emotional intelligence and conflict management.

CONCLUSION

Conflict is a natural and inevitable result of human communication. One of the most important factors for effective and constructive conflict management among people is the conflict management style that people apply to solve the conflict. Having knowledge and skill of conflict management seems urgent. Conflict management, in fact, means applying correct methods to solve the conflict when facing with it. Political intelligence is one of the criteria of success of managers in an organization through which influences can be made for appropriate changes. Political intelligence is about working honestly in order to get common goals and advantages, not in order to get personal advantages. Political intelligence clarifies a clear social agility in organizational setting that manages the effect of behavior on work. Political intelligence includes distinguished social skills about behavior that specifically emphasizes on the effect on working behavior. Political intelligence is active management of reactions against change and power and influence leverages [38].

People who have a high level of political intelligence know who they must effect on to earn more benefits in changes. In addition, they know the best time and method to make people accept the changes [39]. One of the most important factors determining the manager's ability in effective solving of conflict is having emotional intelligence. Nowadays, emotional intelligence is one of the determining factors of people's success at work and in life [3]. The results of the present study showed that there is a direct and significant relation between emotional intelligence with conflict management by managers. It means that the higher emotional intelligence of managers is, the more successful they are in conflict management. Furthermore, political intelligence plays a mediating role between emotional intelligence and conflict management and increases the effect of emotional intelligence on conflict management. Results of the present study are also confirmed by other studies. Keramati et al [31] showed a positive and significant relation between emotional intelligent and conflict management strategies. Malek [28], Jordan and Troth [29] and Steve Larengon [30] showed the correlation between emotional intelligence with conflict management strategies.

CONFLICT OF INTEREST
There is no conflict of interest

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None

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NOWRUZ IN TRADITION TRANSITION

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ABSTRACT

*This study tries to explain the theoretical and empirical basics of Nowruz rituals. Individual and social factors based on tradition, modernity, and religion lead to the construction of Nowruz rituals according to the action of individuals and created structures. Theoretical framework of the study is based on a combination of traditional and modern approaches. Considering the lack of theoretical framework in the present condition, a new approach is suggested in order to understand Nowruz within modernistic theories and globalization processes. According to this attitude, Nowruz is a changing, flexible, and temporal ritual which plays a role in the formation of the identity of modern man within the framework of new or modern conditions. Using descriptive-analytical method based on library methods, this study has attempted to clarify the issue. The results of the study and the practical experiences of the researcher in this field revealed that human acting has an effective role in common rituals like Nowruz.
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INTRODUCTION

Some terms such as modernity and globalization, have developed fuzzy modeling of Nowruz in the religion, human, social sciences, and especially sociology texts. From among Iranian traditional celebrations, New Year celebration and autumn or Mehrgan festival at the end of summer are the most popular and are naturally hold according to the Persian cultural calendar. The geographical and cultural dispersion of this celebration shows its popularity. A historical review shows that there have been various positive and negative attitudes toward this celebration, insofar as, due to the dominance of globalization term in sociology literature, different forms of its popularity and development are evident in different times and places. In this historical review, Iran society, which has been dominated by religions and especially Islam, not only has emphasized Nowruz rituals but also has considered the way of celebrating it with sensitivity and attention. From the sociology perspective, conformity and nonconformity with the Nowruz rituals has been directly associated with human acting, and society structure and in particular dominant structures of government judge the conformity and nonconformity of their followers according to that. This process has been effective in constructivism various structures from Nowruz rituals. The main question of this study introduces the various perspectives that pay attention to Nowruz rituals based on religious thoughts and beliefs of their followers.

MATERIALS AND METHODS

Theoretical framework of the study is based on a combination of traditional and modern approaches.

RESULTS
The worldwide development of Nowruz in ancient times
Nowruz is a celebration and ritual that because of its emphasis on renewal of nature and its simultaneity with the beginning of spring, it has had general and international acceptance and has not been restricted to certain political boundaries. In ancient times, the Persian Empire was the largest empire of the world and major powers of Egypt and Greece were its rivals. [1] Despite the opposition of the governments in these countries, Nowruz rituals were common in these countries. Herodotus believed that the ancient Egyptians were the first people who divided the year into 12 months and added 5 days to the end of it. Nowruz rituals and celebration has thousands years of history; in addition to Zoroastrians and Muslims who have different beliefs, Armenian Christians and Persian Jews in Samarkand and Bukhara as well as some cities in the Central Asian celebrate the vernal equinox and New Year. In addition to Iran,

there are celebrations and rituals at the beginning of spring in Minor Asia and Greece. According to ancient myth, in Lady and Ferri Jiu regions in the north of Minor Asia a celebration was hold when the sun reached Aries and at the time of vernal equinox in honor of "Si Bel" goddess of fertility, known as the mother of gods and goddess "Otis". Historians stated that this celebration and especially the great celebration and feast for three days, March 25 to 28, i.e. 4 to 7 April, were hold in all the lands of Ferry Jiu, Lady, Greece and Anatolia at the time of August King (Homayuni, 2004). Nowruz rituals and similar celebrations have existed in the past history of Europe because, before the spread of Christianity, Mithraism was the common religion of this area, and even after converting to Christianity, Christmas and January celebrations were not popular. [2] Based on the available archaeological and historical evidence at the beginning of the fourth century AD, more than 300 Mithraic temples (Mehrabeh) were in Italy, and all people celebrated Yalda (affection birth) In addition, Roman legionary transferred these rituals to the Empire territories including Germany, Austria, and England, and various Mehrabeh were built in those countries. [3]

Nowruz in Islam religion

Muslims, especially during the second Umar, Umar bin Abdul Aziz of the Umayyad caliphs who were opponents of the Shiites and Iranians, tried to revoke Iranians' holidays, and they put pressure on those who sent gifts to high authorities to celebrate these holidays. But this tradition was so deeply affiliated with the Iranian people's thoughts and feelings that could open a position triumphantly, and with the rise of the Abbasid and due to the influence of Iranian family of Barmakid in the Interior Ministry experienced revival. [4] Especially during Al-Bouet period, which formed the first Persian Shiite dynasty in Iran, it was very common and became widespread in Mesopotamia, that is, the official Baghdad and Basra. Historical landmarks manifest this type of development or, in new terms, globalization. Moreover, in other places and periods, like Syria, Egypt and North Africa, the celebrations were held irregularly in some times. For example, in India during Akbar Shah, Jahangir, and Jahan Shah Nowruz ritual was hold, but of course it was different from Iran's ritual. Nowruz festival in this country has a long history, and, in addition to the Persian Indians who consider this ritual as their own local and traditional celebration, Nowruz was hold in other tribes of India with the name of "Holi festival". [5] Holi which was mixed with the religion and social structure of various Indian tribes still had Iran's common symbols. In addition, in Pakistan, especially among Shiites, similar ceremonies were held. Thus, with the arrival of Islam in Iran, and the development of this religion from Indian subcontinent to North Africa, Nowruz has also become common among non-Iranian ethnic groups. [6]

Documents and sources suggest that there has been no opposition with this ritual after Islam. But in Safavid period which was the first powerful Shiite dynasty, Nowruz celebration found a governmental pertinency and was considered as a more national and courtly symbol. However, with the influence of Shiite scholars on the court, the importance of national symbols was reduced and jurisprudence dominated symbols. Historical studies of Islam historical texts show Imam's attention to Iranian's rituals. For example, Ali ibn Abi Talib was asked about Nowruz, and at the same time a gift was given to him as a sign of Nowruz celebration. He asked: "what is this gift for"? They answered: "O Ali ibn Abi Talib this is Nowruz's gift." Then, Ali said that: "make every day for us Nowruz (new day)." There are other traditions in this regard that suggest that many people offered Ali ibn Abi Talib Nowruz gift, and he was receptive. The gifts were mostly sugar, wheat, and sometimes precious garments put in silver dishes. This attention was also continued in other periods; for example, Imam Jafar Sadiq (peace be upon him) quoted: O Mu'alla Nowruz is a day in which God obligated His servants to worship Him and do not associate anything with Him and believe in His apostles, prophets, and saints. Moreover, it is the first day in which the sun has raised, pregnant winds have blown, and earth flowers and blossoms were created. It is a day in which Nouh's (peace be upon him) ship was placed near Joodi mountain. This is a day in which thousands of people who fled their homes from fear of death and God caused them death and then revived them on this day. And it is a day that Gabriel was revealed to Prophet Muhammad (may Allah bless him and his family). [7] This is a day in which Ibrahim (peace be upon him) broke the idols of his own tribe. This is a day in which the Messenger of Allah (may Allah bless him and his family) was riding Ali ibn Abi Talib (peace be upon him) on his shoulders to drop Quraysh idols from the top of the house of God and crushed them. It can be inferred from traditions that Ali ibn Abi Talib never objected to Nowruz celebration, but said that every day of you be Nowruz. In another tradition Ali ibn Abi Talib (peace be upon him) said that today is holiday, tomorrow is also holiday, every day that we do not sin God is our feast day . Islamic Caliphate tradition verifies the above Nowruz documents. Allameh Seyyed Jafar Murtaza writes: Sunnis celebrated Nowruz, and send each other gift. Al-Mutawakkil, the Abbasid caliphate in Baghdad, distributed things made of amber and special flowers among people. It is stated that he was the first person who delayed Nowruz's Day for tolerance of religious minorities, and his Abbasid mother also marked the day . Vasegh also marked the day . Mansour Davaniqi also highlighted this day. [8] The first person who put emphasis on this day and declared ancient holiday was Hajjaj bin Yusuf Saghafi . Saleh Verdani, an Egyptian scholar, writes: in the reign of Fatimid, Nowruz

was celebrated and a variety of sweets was distributed on this day. All these actions were done by Islamic caliphs in the first three centuries of the beginning of Islam, and none of the great scholars complained . [9]

Nowruz and globalization

In recent years, Nowruz has attracted the attention of scholars all over the cultural area of Iran . This attention is, on the one hand, derived from Nowruz role in politics of nationalism and independence of some countries such as Tajikistan, Azerbaijan and Central Asian countries and ethnic conflicts in Afghanistan. On the other hand, it is the result of "globalization" and the importance of ethnic rituals in global processes, including migration of ethnic minorities to the West. [10,11] But, despite the relative magnitude of these studies, most of them are either from literary perspective devoting to praising Nowruz and Spring, or from historical point of view that consider its historical or mythical roots . Others have commercial and advertising content published in the press and media. There have been few theories to explain Nowruz in the context and structure of modern world because, as stated, the research discourse of Nowruz is essentially based on the view of historical, literary and folkloric studies, not anthropological. [12] Thus, even the anthropological studies of this area are restricted either to historical reviews or to folklore reports that collect customs of Nowruz in different areas or among literary and historical texts. Nowruz is one of the elements of Iranian culture which in recent decades more than any time in history has spread beyond the borders of the land of "Great Iran" or territories of "field of Iran culture", i.e. Central Asia, India and the subcontinent. [13] This process can be named "Nowruz re-globalization" because Nowruz had already a worldwide expanse during a course of history. Although Nowruz in some ways is known as a regional and territorial celebration and it is mostly linked with the name of Iran, in reality it is more widespread. Considering this perspective, two basic stages in the history of Nowruz can be separated. The first stage is "Archaic period" which was common in almost all the world. With the spread of Christianity, emersion of Islam and the decline of Iranian religion (i.e., Zoroastrianism and Mithraism), Nowruz found a limited scope. [14] The second stage is in step with "globalization processes" and especially "migration" of ethnic Iranian groups from Iran, Afghanistan, Tajikistan and Central Asia to Western countries and all around the world that results in holding Nowruz rituals all over world. Although Nowruz celebrations are expanding at the global level again, but the causes, functions, modalities and procedures of holding Nowruz are fundamentally different from the ancient times. Today Nowruz ritual is not hold with the past mythical narrative, but it is hold in the context of modern and post-modern needs and requirements. As we know, Nowruz archeological logic is "Nowruz myths"; such as, "the beautiful myth of creation in ancient Iran," "the symbolic myth of awakening anniversary of the nature from hibernation," "Jamshid period myth," and the legend that jam is mixed with Solomon. [15] Among these legends, the foundation of Nowruz is ascribed to Solomon . But today's logic of Nowruz is "modern and postmodern myths" that has been rarely studied and explored. Today, all of the historical myths are reproduced complexly in the process of forming the identity of Iranians because nostalgia of the past history of the country forms some of the fundamental components of human development and evolution that results in restoration and repairing the suspension and curtailment of identity at individual and collective levels by adhering to the roots and commonalities. Therefore, today Iranians and other nations, consciously (actively) and somehow "conventionally" come together to celebrate Nowruz. This deliberate and conscious essence differentiates it from the older traditions that were holding unconsciously and as cultural routines. Because these rituals are done consciously, Hebert Blumer believes that humans always consider themselves free and authoritative so that they can choose elements from the past that fit their current situation. [16] Moreover, since they are exposed to other cultures, they often combine their traditional rites with other cultural rituals and practices in "creative ways." In this regard, it can be stated that from the end of the 19[th] century with the massive entrance of Iran to modern era and the formation of discourses and consequently national, religious, and modern identity challenges, Iranians become more aware and conscious about the hidden and obvious layers of their culture. And gradually all the traditions and cultural rituals like Nowruz were not considered as an inherited tradition accepted and applied unconsciously but were considered as cultural and social rituals that people are aware of their meaning and existence. Thus, they seek a new identity in the modern era for themselves because there is a close relationship between modernity and identity. Modernity from anthropology perspective is a kind of knowledge acquisition procedure, recognition, and constant critical evaluation of oneself in order to make the best conformity pattern with all environmental, historical, cultural and social situations of modern period. According to this perspective, each group and society experience a unique process of modernity based on its particular situations. This process may have common aspects with similar communities and groups but have less in common with other communities and groups; therefore, the modernization process in nature has always been an adaptation to the constant localization. Thus, as James Clifford stated, in order to reach modernity, each society needs "to invent and recognize its difference from other modernities" . According to Durkheim's positivism approach in sociology, it is believed that rituals establish and maintain solidarity and social

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cohesion. He argued that it is not important why group members come together, but it is important that they come together and collectively do a work. In other words, it is essential that people come together, experience common feelings, and express it as a collective action. Thus, according to Durkheim, what is important is collective action but not why they come together; the social aspect of rituals is important, and Nowruz has this characteristic. Collective ceremonies are one type of these important rituals. Ceremonies are often holding collectively. A number of people come together and exchange emotions with each other by appealing to a specific topic. Emphasis on this function of Nowruz makes it more global.

CONCLUSION

Attention to Nowruz is one of the common aspects of Iran's culture with other cultures. By offering Iran's culture and tradition in these celebrations, not only cultural differences are shown but also their cultural commonalities are emphasized. Nowruz occurs at the beginning of spring which is simultaneous with reconstruction and renewal of nature. In Iran's culture, the reconstruction of culture and renewal of society is simultaneous with the re-birth of nature's greenness and freshness. This is another sign of the union between nature and culture. In Nowruz, man, nature, and society reach a balance. Nowruz, as one of the ancient rites, possesses a complex set of different functions and relations of social life. Today, some cities of Europe have recognized Nowruz and hold it, and a number of leaders of countries send each other Nowruz messages. Thanks to advanced technologies, hundreds of songs and hymns, music, film, poetry and essays are available in cyberspace in relation to the Nowruz that help Nowruz globalization. World interest in Nowruz, like its broad popularity in the past, has shown that each religion coming to this country has never observed any contradiction with Nowruz which has been celebrated simultaneous with renewal of nature. Essentially, opposing it is opposing human nature and nature celebration which is one of the sign of God. Every creed and religion, whether Mithraic or Zoroastrian or even Islam, has been trying to give direction to this celebration which is rooted in the nature, and with the passage of time, it has been so unified with their culture that they believe Nowruz belongs to their ritual and is derived from global context. Various changes in the form and way of holding Nowruz rituals from past to present have emphasized human understanding of time and his active nature, and its continuation can be described through constructivism, dialectic structure, and acting in the form of postmodern sociology theories of Herbert Blumer and Richard Hoggart.

CONFLICT OF INTEREST
The author declares having no competing interests.

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