

ARTICLE

THE ACTIVE IMPACT OF HUMAN COMPUTER INTERACTION (HCI) ON ECONOMIC, CULTURAL AND SOCIAL LIFE

Arun Kumar Singh

*Asst. Professor, College of Computing and Informatics,
Saudi Electronics University, Abha City, KINGDOM OF SAUDI ARABIA (KSA)*

ABSTRACT

Human Computer Interaction (HCI) is the technical feature of how human can interact or interface with their computing devices. Developer and programmers always have to search about HCI when developing new software application and products because inventing a new piece of equipment that is revolutionary and it becomes use to. Due to this effort and development of their products become user friendly and people have to consider HCI as easy to use by everyday life. One of the main feature within HCI is that how humans can use computers. Studies and research activities are under consideration to explore how people use and interact with computers and how new development would affect user's future communication and interaction. "Human Computer Interaction is well-organized with the design, evaluation and implementation of interactive computing devices for human use. Human Computer Interaction (HCI) research is performed to provide and promote a scientific understanding of the interaction between humans and the Computing/Informatics technology and tools that we use. HCI is an important and effective area to concern in human lives. Now a day it is necessary to be able to communicate information to each other, whether by reading text online, seeing videos or by using more advanced computer technology. In this article, I will try to describe the active impact of HCI on Economic, Cultural Environment and Social Networking life.

INTRODUCTION

"Human Computer Interaction is a well-organized with the design, evaluation and implementation of interactive computing devices for human use. Human Computer Interaction (HCI) research is performed to provide and promote a scientific understanding of the interaction between humans and the Computing/Informatics technology and tools that we use. HCI is an important and effective area to concern in human lives. Now a day it is necessary to be able to communicate information to each other, whether by reading text online, seeing videos or by using more advanced computer technology. People have to consider HCI because the products concern with the easy interface and easy to use by peoples in their everyday life. [1] HCI consists mainly 3 parts:

1. The Customer
2. The Computing Devices
3. The Interactive Way that both Work Together

If all of these above concern parts are not coming together in a new software or product, then a perfect impact and success will be not happened in human computer interaction. HCI also has many fields these are where HCI works properly:

Psychology, Computer Science, Language, Sociology, Ethnography, Semiotics and Branding, Design, Engineering, Ergonomics and Human Factor. In Semiotics, instead of text this is the use of symbols, this is mainly used because people speak different languages and if symbols are used language isn't needed and there is less confusion [2]. Ethnography, this means that things in one country could mean something different in another country. An example of this is in the India it is common for an electric plug is Type C, D and M, while in Saudi Arabia it is common for an electric plug is Type A, B, F and G. So, it important in HCI to change specific things in different countries so the population isn't offended [3].

HCI impact giving a dramatic change on the way of people's economy, culture and their social life in this Computing/Informatics Era. In the case of virtual reality people believe that it will become the new reality which we live in, because it creates a new life for everyone even disabled users, they will now be able to live a normal life without any disabilities. HCI providing a positive effect on culture, economy and society, it has created new ideas and products making now a day for better and more advanced place to live in. We must accept that HCI will affect the future massively, in both a good way and in a bad way, for example new developed and improved types of product will be created that will take the society to a new era of technology and seem intelligent, but to create these types of products it will cost a lot of resources putting the planet in a bad way, it will cost lots of money to get the new products perfect and probably most of the planets resources emphasizing Global warming problems.

BASIC EXAMPLE OF THE HCI

One of the main focuses within HCI is the way humans' use computers and devices. Study development and research are undertaken to explore how human use and interact with computing devices and how new designs would affect user's future interfacing.

KEY WORDS

*Human Computer
Interaction (HCI), Social
Life, Economic, Culture,
Affect*

Received: 22 May 2017
Accepted: 14 June 2017
Published: 30 June 2017

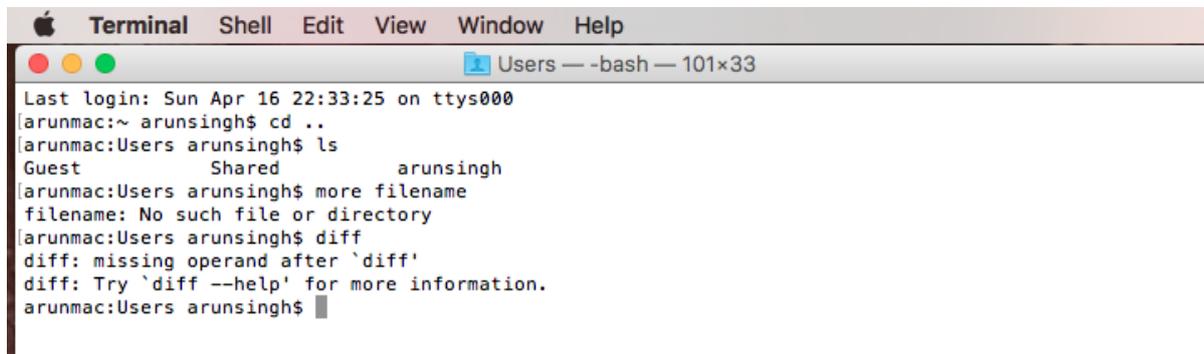
*Corresponding Author

Email:
a.singh@seu.edu.sa,
arunsinghiitfa@gmail.c
om
Tel.: +966-593565533,
+91-7895276828
Fax: +966-172 417169

There are many different interfaces and developed designs that allow people to interact with a computer, some of the more common/well known designs are: [4]

Terminal (Mac)/Command line Editor (CLE-Window)

The terminal/CLE was the only way that people could interact with a computer before the GUI was created.



```

Terminal Shell Edit View Window Help
Users -- -bash -- 101x33
Last login: Sun Apr 16 22:33:25 on ttys000
[arunmac:~ arunsingh$ cd ..
[arunmac:Users arunsingh$ ls
Guest          Shared          arunsingh
[arunmac:Users arunsingh$ more filename
filename: No such file or directory
[arunmac:Users arunsingh$ diff
diff: missing operand after `diff'
diff: Try `diff --help' for more information.
[arunmac:Users arunsingh$

```

Fig.1: Terminal in MacBook Pro (Screen Shot 2017-04-16 at 11.02.46 PM).

The user would need to enter a series of commands into the operating system and press the Return key. The computer would then complete the required task; whether it's creating, copying, deleting or renaming files. As the terminal/CLE was text based, users had to input all of the commands without any typing errors, as a result this made the terminal/CLE an unfriendly way to interact with the computer.

Windows, Icons, Menus and Pointers (WIMP)

WIMP is used as a derogatory term to describe the graphical interface used by the Apple Macintosh and Microsoft Windows operating systems. The term WIMP was commonly adopted by users who strictly utilized text-based operating systems, such as a DOS, Linux, or Unix variant. [5]

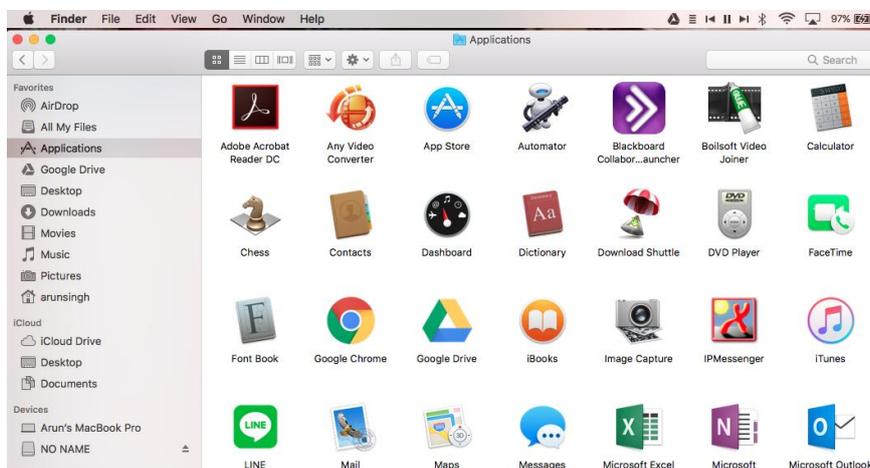


Fig. 2: WIMP in MacBook Pro (Screen Shot 2017-04-16 at 11.07.53 PM)

WIMP is a graphical way to use a computer, by using windows that display different icons. The icon image changes depending on the file type or what program it will open when the icon is clicked on. Buttons are also represented by icons. Menus are also on the window, such as the 'File' menu, these give the user more options to do things like creating new folders. Everything within the windows can be selected or opened by clicking with the mouse (Pointer). When compared to CLE/Terminal interface, the WIMP is a lot more user friendly.

Graphical Users Interface (GUI)

The GUI makes use of graphics to aid the user when using the computer, these can be in the form of drop down menu's, ticking boxes or selecting/clicking on a button. GUI gives the user an easy way to access the features of a program, Microsoft Word relies on GUI a great deal for its toolbars and dialog boxes. GUI was designed to be used instead of the CLE as its easier to use and now almost all programs created uses a form of GUI. [6]

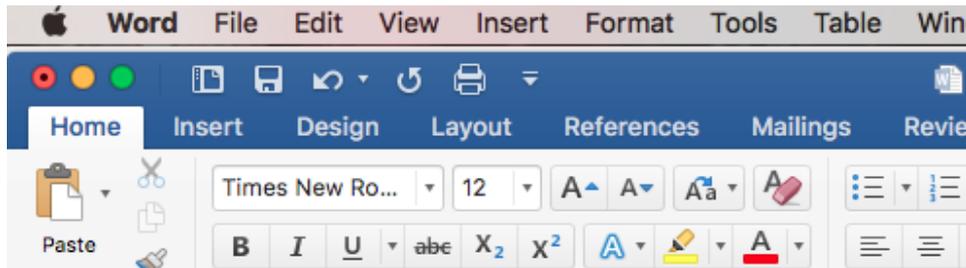


Fig. 3: GUI in Microsoft Office 365 (Screen Shot 2017-04-16 at 11.22.25 PM).

Web User Interface (WUI)

A good user interface, that is intuitive yet powerful, is essential when configuring and managing network security components. A browser based Web User Interface (WUI) represents a good way to provide this. Administrators and users already know how to use a web browser to access services. Providing network device configuration in this way builds on this experience and gives them a familiar, yet rich, way to configure and manage network resources.



Fig. 4: WUI in MacBook Pro (Screen Shot 2017-04-17 at 12.33.11 AM).

The user interface (UI), in the industrial design field of human computer interaction, is the space where interactions between humans and machines occur. The goal of this interaction is to allow effective operation and control of the machine from the human end, whilst the machine simultaneously feeds back information that aids the operators' decision-making process. Examples of this broad concept of user interfaces include the interactive aspects of computer operating systems, hand tools, heavy machinery operator controls, and process controls. The design considerations applicable when creating user interfaces are related to or involve such disciplines as ergonomics and psychology. [7]

ACTIVE IMPACT OF HCI

Economy

There are number of speed up inputs everywhere to help a user now. As an example of a speed up input we can see in a super market. This can help an individual because if ever one want to know the price of a product they can go to a barcode scanning machine where user can press the barcode to the reader and it tells about the detail of product. This impact on the economy will mean that people can shop much faster and efficiently and will encourage older people to shop as they will not have to Increased Automation of Outputs will mean that a business or company does not have to hire any employees or have to pay amounts of money to their employees as a company will only have limited employees to pay a salary to. [8] Decreased Complexity of Inputs will mean that people will be able to use new devices much more easily. It has to be kept simple otherwise new people that come will not know how to operate their devices and screen.

Text Readers impact the economy for visually and speech impaired individuals, a text read says aloud whatever you type into it. This will impact the economy because if a speech impaired person was to hold a meeting or a say a speech to a group of people they could easily understand the person due to the text

reader. Some new Text Readers now can translate something you type in English and say something in, for example Arabic or Hindi. This impact in the economy will help people interact to different people around the world and will hopefully help companies and business's grow.

Voice recognition or Voice Input is generally used in devices such a mobile to help send text messages and to communicate people and browse the internet web of concern contacts. This will affect that in buildings or famous places they can put voice recognition in elevators or in doors, so someone who is visually impaired can say "Open" and the doors will open up without pressing the buttons and for elevators a person could say "Floor 13" and it will take the person.

The impact of HCI on the economy will allow people with disabilities to do all activities everywhere and will help them to do jobs and other things. Mobile Communications allow people to communicate with others around the globe no matter day or night, the impact on the economy has helped companies to make communication which can help make and finalise deals of discussions. [9]

Culture

HCI has affected culture in many ways; Technology has opened up a lot of opportunities for private businesses because normally a small business would have too rent out an office to work, but nowadays they can do all of their work from home which is more convenient for them. People can now text each other to set up meetings instead of arranging one on the phone or by e-mail. This makes thing a lot easier to do because it is a faster and more efficient way of communicating. Because of technological developments, a greater number of people are able to work from home and are able to be more flexible and effective with where they use their computer. Laptops, PDA's, mobile phones, mobile computing and other portable devices, have replaced paper diaries and journals. Remote access to the Internet, home desktops and documents, such as word processing or spreadsheet files, have introduced people into mobile computing. As Internet access and speeds have increased, email has taken off which has mostly replaced letters and memos. [8, 9]

Laptops have becoming smaller, lighter, cheaper and more powerful over the years and has meant that they have become more common. They can be carried around with ease, this makes them an ideal for people who travel and still want to be able to access a computer or resources online. Not only are laptops being used for computing but also gaming and entertainment, particularly when traveling, but this has led to tablets (such as the iPad) which have started to replace laptops for portable gaming and entertainment. The way in which people are now buying and listening to music has changed, buying a physical album is no longer the main way which people listen to their music. The main way that albums are now being bought is online and downloaded onto the person's computer, one example would be iTunes by Apple. As well as the change to downloading music, portable music players (like the MP4 or iPod) have been developed and are becoming more common; as they allow the user to listen to their music when on the move. Games are becoming more complex and sophisticated and require more disc space to store the larger programs and require much more powerful hardware, in order to be played. Consoles where created into to run video games, these consoles allowed players to play games in their living rooms or any other room in their house. The current major released consoles are the Xbox 360 (Pro, S and E) by Microsoft and PlayStation 3/4 by Sony.

With the development of new HCIs', some working environments require less variety of work or skills. In some manufacturing companies use robots to construct cars (or other products that require large amount of assembling), as a result this has led to less specialized employees. This is known as deskilling. Automated systems can reduce the complexity of work, meaning the employees may feel that they are less valued and motivated.

Developing nations have seen big changes because of new technology. More call Centre's are based overseas and more products are being produced aboard and imported, this has led to an increase in job for those' living in developing counties.

Society

With the development of new HCI's, computers accessibility becomes more to people and so are being used more and more in everyday life. A large amount of the population own computers or have access to a computer to use for whatever purpose they need it for, whether that to word process documents, research material online, send emails. Computer chips are also used in a large range of electrical equipment for example domestic and industrial appliances from washing machines to microwaves to cook food where buttons and dials can be used as the interface. Many businesses, hospitals, researchers, creative industries (for example Movie, Games and TV companies) are just some of the people that depend upon computers. By creating new ways for people to interact with and could even be used in new ways.

But also, creating a new form of HCI, even if designed to be easier and more effective for human use, sometimes isn't picked up on quickly or sometimes avoided because it is designed to be used in a manner that some people find unusual or alien to them. That's why a lot of developers try to keep consistency in their HCI designs, so that people who have used one of their programs and then can open another one of

their programs and feel more comfortable, as the menus, options, colours, fonts and the overall interface look similar to their other program.

Even domestic appliances make use of simple and well-designed HCI's, as people normally understand how to use the appliance without even looking at the instruction manual before use. Not only do the domestic appliances use words to explain to the user what each button does but they can also use images, drawing or icons to inform the user about the function of each button. Using images can be more effective than using words, as images can be universally recognized, whereas words can only be understood by people who speak that language (for example the pause and play icons that have transferred from musical cassette players to computer software). Not only has the computer changed because of the developments in HCI, but almost everything that has a computer within it, from washing machines to microwaves to mobile phones. [8, 9]

Voice recognition software allows the user to speak, via a microphone to the computer in order to write text. The software takes what the user has said and then converts it into text on the screen, as if it's being typed by the user. Although this software can aid those with visual impairments there can be some drawbacks for the user, such as a delay between what has been said and the word being displayed on the screen or requiring the user 'train' the computer to accept their voice. Speech synthesis, similar to voice recognition, creates speech from word that the user has entered. An example of this would be the software that Stephen Hawking uses to interact with other people. The same method and artificial intelligence is also used within automated phone services, but instead of entering text the user is asked to press a different key in their phone. There are also interfaces that are designed that don't use voice recognition or speech synthesis, but make use of extra on-screen help. For example, subtitles can be turned on for TV programs movies and even some web sites, to help users that have hearing impairments. Some interfaces have been specially design for users with sight impairments by making use of larger text or using colours that are not affected by people who are colour blind. Red-green combination is the most common form of colour blindness, so by using a red-blue or yellow-blue colour combination in the interface design would allow a lot of people who are colour blind not to miss information and find using the interface easier. Remote controlled devices are often used for hostile environments that are too dangerous for humans, such as using bomb disposal robots to locate and dispose of explosives. Other forms of HCI can be used to allow for people to access inaccessible environments, like sending satellites into space or remote-controlled vehicle to Mars to conduct research. This means that the user can be a safe, in some cases a long distance away from the danger.

CONCLUSION

Human Computer Interaction (HCI) is the technical feature of how human can interact or interface with their computing devices. Developer and programmers always have to search about HCI when developing new software application and products, because inventing a new piece of equipment that is revolutionary and it becomes use to. Due to this effort and development of their products as user friendly, people have to consider HCI as easy to use by everyday life.

In the concern area of culture, effect of the fast inputs working on economy will make shopping faster in store, and much more efficient for the customers. This is making products purchasing easier. The HCI impact reduce the complexity of input on economy, if all products were made as user friendly and easy to access for everyone. The effect on a text reader will creates access to disabled users who cannot read text but need to hear it instead. The voice input software effect has on the economy is that it has created another type of market specified for the disabled user trying to make life as easy as possible for them. Mobile communication is providing a popular product for every user by making it easy communication. It becomes extreme popular in the world now a day. Playing games can help improve the capability and hand-eye coordination. They provide mental stimulation and promote social interactive networking. Flexible phone makes it easy for user to communicate and improved the usability that is the way of products that can made to be as easy to use as possible for every possible user. In other way touch screen effect have on society has become massive because it is easy to use, beneficial, and the latest product of this era. Input/output accessories has affected the society by making it easier to interact with mobile phones or other computing devices, if all products were not user friendly it would make it very difficult for people to use the product, this is why companies are manufacturing the standard size accessories for easiest way to use a product. Domestic computing appliances allow users to access around the house from a single place. Data logging is a right way for storing the data that may help researcher and developer later on; This will affect society by making it easier to log data. Virtual reality (VR) is also applies to computer-simulated environments that can it very simple to use, so that the user can get the full flesh effect of virtual reality.

“Human Computer Interaction is a well-organized with the design, evaluation and implementation of interactive computing devices for human use. Human Computer Interaction (HCI) research is performed to provide and promote a scientific understanding of the interaction between humans and the Computing/Informatics technology and tools that we use. HCI is an important and effective area to concern in human lives. Now a day it is necessary to be able to communicate information to each other, whether by reading text online, seeing videos or by using more advanced computer technology.

CONFLICT OF INTEREST

Authors confirm there is no conflict of interest.

ACKNOWLEDGEMENTS

None

FINANCIAL DISCLOSURE

Authors confirm there are no financial disclosures.

REFERENCES

- [1] (<http://www.cadazz.com/cad-software-Sketchpad.htm>) Information on Ivan Sutherland and the 'Sketchpad'. Cited 02/10/2012
- [2] (<http://www.guardian.co.uk/technology/gallery/2010/feb/14/mobilephones-gadgets-iphone>) Information on mobile phones. Cited 02/10/2012
- [3] <http://asl.cs.depaul.edu/> (<http://asl.cs.depaul.edu/>) information on the hearing impaired, Cited 15/10/2012
- [4] http://www.jhigh.co.uk/ComputingSG/GPPs/HCI/HCI_GUI.html
- [5] http://en.wikipedia.org/wiki/Color_blindness#Design_implications_of_color_blindness
- [6] <http://www.baesystems.com>
- [7] https://en.wikipedia.org/wiki/User_interface
- [8] <https://rizyryan.files.wordpress.com/2012/10>
- [9] Karen Anderson, David Atkinson Beaumont, Allen Kaye, Jenny Lawson, Richard McGill, Jenny Phillips, Daniel Richardson. Information Technology Level 3 (Book 2). Heinemann (behalf of edexcel). ISBN 9781846909290