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Human Computer Interaction (HCI): An Analysis

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Abstract—*Human–computer interaction (HCI) researches the design and use of computer technology, focusing particularly on the interfaces between people and computers. Researchers in the field of HCI both observe the ways in which humans interact with computers and design technologies that lets humans interact with computers in novel ways. It is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings. HCI factor is that different users form different conceptions or mental models about their interactions and have different ways of learning and keeping knowledge and skill. HCI is that user interface technology changes rapidly, offering new interaction possibilities to which previous research findings may not apply. Finally, user preferences change as they gradually master new interfaces.*

Keywords*: Interface; Extent; Mental Models ; Conceptions ; Technology;*

1. INTRODUCTION

Human-computer interaction (HCI) is an area of research and practice that emerged in the early 1980s, initially as a specialty area in computer science embracing cognitive science and human factors engineering. HCI has expanded rapidly and steadily for three decades, attracting professionals from many other disciplines and incorporating diverse concepts and approaches. To a considerable extent, HCI now aggregates a collection of semi-autonomous fields of research and practice in human-centered informatics. However, the continuing synthesis of disparate conceptions and approaches to science and practice in HCI has produced a dramatic example of how different epistemologies and paradigms can be reconciled and integrated in a vibrant and productive intellectual project. The main goal of HCI is to solve real problems in the design and use of technology, making computer-based systems easier to use and more effective for people and organizations. Ease of use and effectiveness are critical to the success of any systems that interact with people, including software systems, home, office and factory appliances, and web and phone applications.

This paper provide an analysis of HCI systems and cover most important applications with its designing issues. Then an overview of technologies and also recent advances in the field is provided.

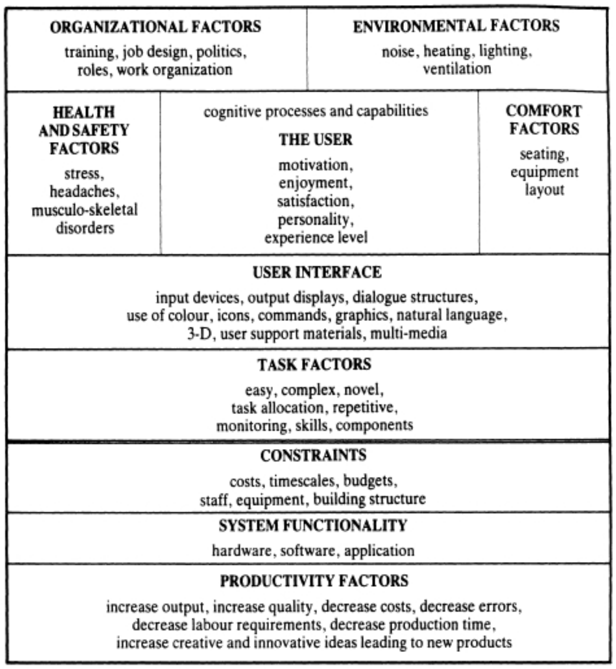
2. DESIGNING OF HCI

Design in HCI is more complex than in many other fields of engineering. It is inherently interdisciplinary, drawing on and influencing diverse areas such as computer graphics, software engineering, human factors and psychology. Furthermore, the developer's task of making a complex system appear simple and sensible to the user is in itself a very difficult, complex task

The principles for applying human factors to machine interfaces became the topic of intense applied research during the 1940's, when equipment complexity began to exceed the limits of human ability for safe operation. However, the complexity of computing and of software development projects pose additional demands. An engineering paradigm that is common to many other fields can be generalized to a technical approach for engineering usability in computing systems and is now in widespread use .The paradigm follows an iterative cycle through analysis, design, implementation, and evaluation. Usability engineering structures human factors activity to work within software engineering projects.

Development of usable systems draws on technologies from user interface media, software architecture, process and data modeling, standards, and tools for modeling, building and testing user interfaces. Each can be a topic of research or application. These technologies will be covered in the following sections on the psychology of HCI and the computer science of HCI.

3. FACTORS OF HCI



Factors in HCI.

4. DIFFERENT TECHNIQUES OF HCI

4.1 Visual Representation Techniques

4.1.1 Typography And Text

Typography and text most screen-based information is interpreted according to textual and typographic conventions, in which graphical elements are arranged within a visual grid, occasionally divided or contained with ruled and coloured borders.

4.1.2 Maps And Graphs

Maps and graphs contains basic diagrammatic conventions rely on quantitative correspondence between adirection on the surface and a continuous quantity such as time or distance. These should follow established conventions of maps and graphs.

4.1.3 Schematic Diagrams

Schematic diagrams used for engineering drawing conventions allow schematic views of connected components to be shown in relative scale, and with text annotations labelling the parts.

White space in the representation plane can be used to help the reader distinguish elements from each other rather than directly representing physical space.

4.1.4 Images

Images or pictures are the pictorial representations, including line drawings, paintings, perspective renderings and photographs rely on shared interpretive conventions for their meaning. It is naïve to treat screen representations as though they were simulations of experience in the physical world.

4.1.5 Node And Link Diagrams

Node and link diagrams are still widely perceived as being too technical for broad acceptance. Nevertheless, they can present information about ordering and relationships clearly, especially if consideration is given to the value of allowing human users to specify positions.

4.1.6 Icons And Symbols

The design of simple and memorable visual symbols is a sophisticated graphic design skill. Following established conventions is the easiest option, but new symbols must be designed with an awareness of what sort of correspondence is intended - pictorial, symbolic, metonymic (e.g. a key to represent locking), bizarrely mnemonic, but probably not monolingual puns

4.2 USER INTERFACE TECHNIQUES

4.2.1 Virtual Reality

Virtual Reality (VR), which can be referred to as immersive multimedia or computer-simulated life, replicates an environment that simulates physical presence in places in the real world or imagined worlds. Virtual reality can recreate sensory experiences, which include virtual taste, sight, smell, sound, and touch.Most up to date virtual reality environments are displayed either on a computer screen or with special stereoscopic displays, and some simulations include additional sensory information and emphasise real sound through speakers or headphones targeted towards VR users. Virtual reality is often used to describe a wide variety of applications commonly associated with immersive, highly visual, 3D environments. The development of CAD software, graphics hardware acceleration, head-mounted displays, datagloves, and miniaturization have helped popularize the notion.

4.2.2 Augmented Reality

Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are *augmented* (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented) by a computer. As a result, the technology functions by enhancing one's current perception of reality . By contrast, virtual reality replaces the real world with a simulated one. Augmentation is conventionally in real-time and in semantic context with environmental elements, such as sports scores on TV during a match. With the help of advanced AR technology (e.g. adding computer vision and object recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulable. Artificial information about the environment and its objects can be overlaid on the real world.

4.2.3 Tangible Interface

A tangible user interface (TUI) is a user interface in which a person interacts with digital information through the physical environment. The initial name was Graspable User Interface, which is no longer used. The purpose of TUI development is to empower collaboration, learning, and design by giving physical forms to digital information, thus taking advantage of human abilities of grasp and manipulate physical objects and materials.

4.2.4 Paper Interfaces

It analyses the ways in which the properties of paper are preferable to computers for many kinds of activity. A useful resource for designers of mobile devices substituting for paper (phones and tablets), but has also inspired The research in which paper is integrated with digital systems, for example with fiducial markers on the page that can be traced by cameras

4.2.5 Mixed Reality

Mixed reality combines physical objects with information displays, for example by projecting digital data onto objects on a table, or onto paper. Fiducial markers can be used to determine the identity and location of individual sheets of paper, and project additional information onto them.

5. CONCLUSION

Human-Computer Interaction is an important part of systems design. Quality of system depends on how it is represented and used by users. Therefore, enormous amount of attention has been paid to better designs of HCI its factors and its various techniques to analysis the different techniques to evaluate the interaction of the user. HCI as a specialty of computer science; HCI has grown to be broader, larger and much more diverse than computer science itself. HCI expanded from its initial focus on individual and generic user behavior to include social and organizational computing, accessibility for the elderly, the cognitively and physically impaired, and for all people, and for the widest possible spectrum of human experiences and activities.Virtual reality is also an advancing field of HCI which can be the common interface of the future. This paper attempted to give an overview on these issues and provide a analysis of existing research .

REFRENCES

[1] R.W. Picard, *Affective Computing*, MIT Press, Cambridge (1997).

[2] J.S. Greenstein, “Pointing devices”, in M.G. Helander, T.K. Landauer and P. Prabhu (eds), *Handbook of Human-Computer Interaction*, Elsevier Science, Amsterdam (1997).

[3] B.A. Myers, “A brief history of human-computer interaction technology”, *ACM interactions*, 5(2), pp 44-54 (1998).

[4] B. Shneiderman, *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (3rd edition), Addison Wesley Longman, Reading (1998)

[5] Card, S.K., Moran, T.P., and Newell, A., (1983) The Psychology of Human-Computer Interaction, Hillsdale, NJ: Erlbaum.

[6] . Foley, J.D., van Dam, A., Feiner, S.K., and. Hughes, J.F. (1990) Computer Graphics: Principles and Practice, Reading, MA: Addison- Wesley.

[7] Myers, B. A. (1989) "User-interface Tools: Introduction and Survey," IEEE Software, vol. 6(1) pp. 15-23.

[8] Olsen, D.R. (1992) User Interface Management Systems: Models and Algorithms, San Mateo, CA: Morgan Kaufmann

[9] Rheingold, Howard (1991). *Virtual Reality*. ISBN 0-262-68121-8.

[10] Cognitive Architectures and HCI

[11] Susan S. Kirschenbaum, Wayne D. Gray, Richard M. Young