A Review Paper on Human Computer Interaction

Article · April 2018

DOI: 10.23956/ijarcsse.v8i4.630

2 authors, including:

Rizwan Khan
ABES Institute of Technology
56 PUBLICATIONS **99** CITATIONS

SEE PROFILE

International Journals of Advanced Research in Computer Science and Software Engineering
ISSN: 2277-128X (Volume-8, Issue-4)

Research Article | **April 2018**

A Review Paper on Human Computer Interaction

Himanshu Bansal*
Scholar
Department of Computer Science & Engineering
ABESIT, Ghaziabad, Uttar Pradesh, India
himanshubansal98@gmail.com

Rizwan Khan
Associate Professor
Department of Computer Science & Engineering
ABESIT, Ghaziabad, Uttar Pradesh, India
rizwan.khan@abesit.in

Abstract— The advancement in the development of computer technology has led to the idea of human computer interaction. Research experiments in human computer interaction involves the young age group of people that are educated and technically knowledgeable. This paper focuses on the mental model in Human Computer Interaction. There are various approaches of this review paper and one of them is highlighting current approach, results and the trends in the human computer interaction and the second approach is to find out the research that have been invented a long time before and are currently lagging behind. This paper also focuses on the emotional intelligence of a user to become more user like, fidelity prototyping. The development and design of an automated system that perform such task is still being accomplished.

Keywords— Human computer interaction, Emotional intelligence, Interactivity, Younger participants, Fidelity Prototyping.

I. INTRODUCTION

The Human computer interaction is the practice and study of usability. It is about the relationship between a human and a computer, their mutual understandings and by creating a software which would ease the work of a human and people would love to use, and would be able to use it. It may also be said that it is a study of how humans use computers to perform certain tasks and use it in such a way that the interaction is being enjoyed and effective. As the name suggests, it comprises of three parts namely the user, the computer and their interaction. It involves the sketching of low and high fidelity, i.e., the degree of exactness a thing is being reproduced. The initial step to an intelligent HCI is having the abilities to respond and sense appropriately according to user's affective feedback and detect, interpret the affective states shown by the user instinctually. This paper also focuses on various types of hci design approaches.

II. HUMANS

The HCI product is produced and used by the humans which are the users of the product. For understanding humans as an information-processing system, how they communicate, characteristics of the human/user as a processor of information- Memory, attention, problem-solving, learning, motivation, motor skills, conceptual models and diversity.
Language, interaction and communication -

Aspects of language-Syntax, pragmatics, semantics, conversational interaction and specialized languages.

Anthropometric, i.e. the systematic measurement of the physical properties of the human, such as the dimensional descriptors of body size and shape and physiological characteristics of people and their relationship to workplace and the environment around them.

The humans are good at performing fuzzy/hard computations.

III. COMPUTERS

The computers are used for interaction with the users as they have special components that can interact with the users. The computers also provide a platform to user to formulate and interact with the components and provide and effective learning.Computers are good at counting and measuring, precise storage and recall, rapid and consistent responses, data processing or calculation, formulations, repetitive actions, and performance over time, "Simple and sharply defined things".

IV. INTERACTION

The list of skills is somewhat complementary. It is the interaction between a computer and a human to produce an effective output. The interaction is a two- way process between a user and a computer.

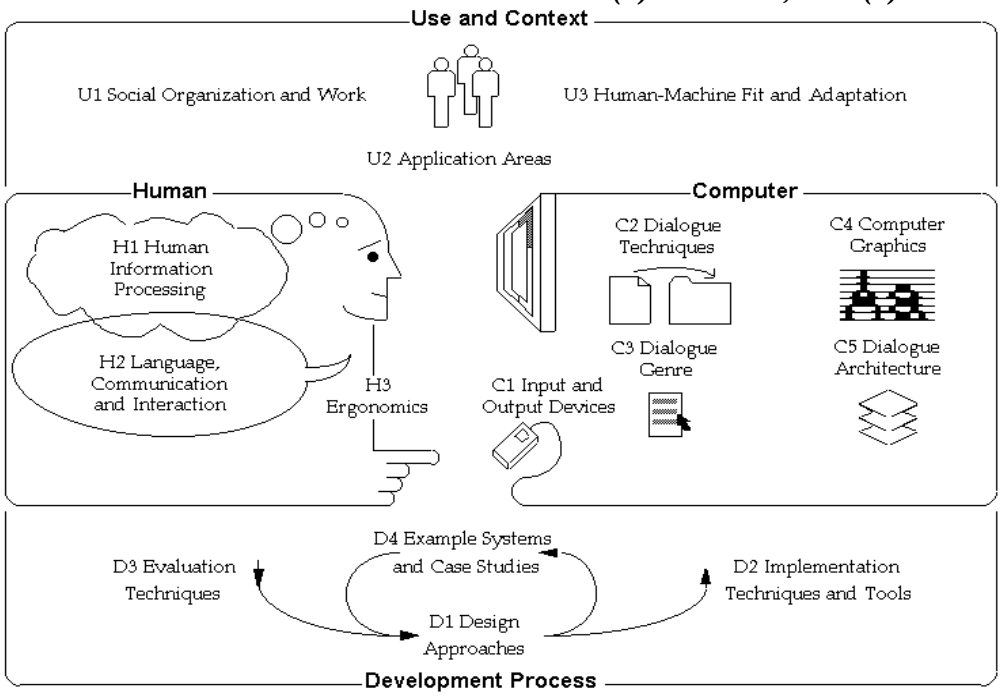

Fig. 1. HCI development

V. HCI DESIGN PROCESS

Ebert's described four human computer interactions design approaches that may be applied to the user interface designs to develop user friendly, methodical, and instinctive users experience for the users. One or more approaches can be used in a single user interface design. The four approaches to design a user interface are-

1. Anthropomorphic Approach:

This approach involves designing human interface such as to produce human like characteristics.

2. Cognitive Approach:

This approaches used to develop a user interface that supports the end user and considers the abilities of human brain and sensory recognition.

3. Empirical Approach:

This approach is used for examining and comparing the usability of multi-conceptual designs.

4. Predictive Modelling Approach:

GOMS method is used for examining and takes into consideration, user's experience in terms of time taken by a user to efficiently and effectively complete a goal.

GOMS stands as g stands for goals, o for operators, and m for methods and s for section rules. The definite measurements of human's performance are used to calculate the time taken by it to accomplish a particular goal.

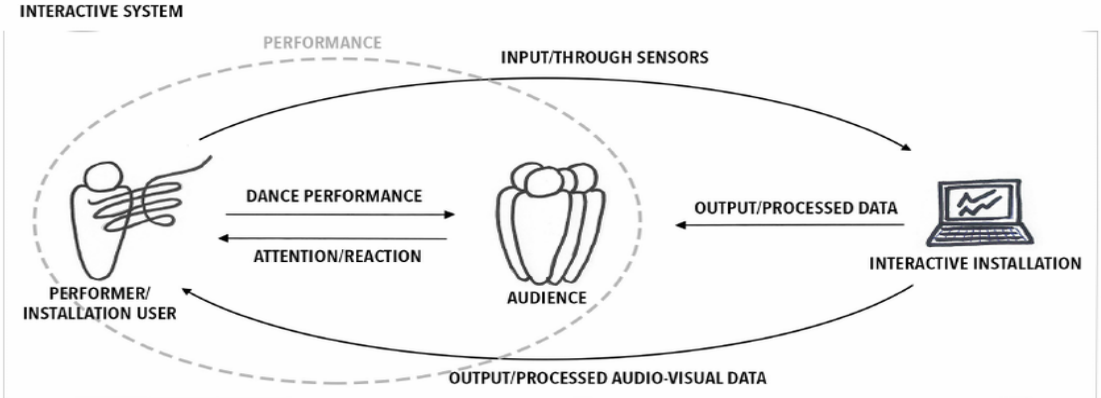

Fig. 2. Interaction between human and computer

VI. FIDELITY PROTOYPING

Fidelity means the degree of exactness up to which a product is reproduced. Prototyping means making basic models from which the other models are made. It includes-

1. Low Fidelity Prototyping:

It is also known as low-tech prototyping, it is simple and easy translation of the product and design concepts. It is used to turn design ideas into tangible and testable artefacts, collecting and analysing users demand at early stage.

2. High Fidelity Prototyping:

It is highly functional and interactive prototyping which is quite close to final product with lots of functionalities and details. It is used in usable evaluation to discover potential issues that may exist during the later workflow, interactivity.

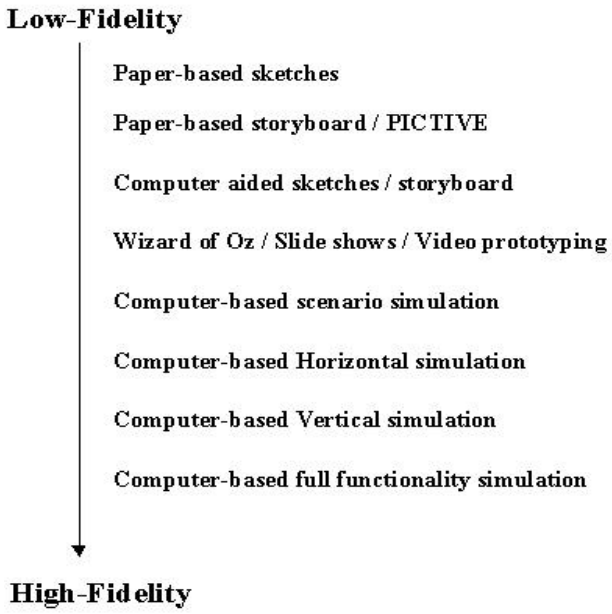

Fig. 3. Precedence diagram of HCI

VII. PARTICIPANTS

The experiments in hci commonly prefers the younger group as being young, they are technically knowledgeable, highly educated, and are unrepresentative of demographic realities. In the case of the older people in research groups, the collection of the data from these participants require alterations and research methods. Formal education and literacy level are characteristics in which older group of people differ widely from younger group of participants in the research.

VIII. THE MENTAL MODEL

The most important concepts of human computer interactions are the Mental Models. These Mental model is what a user believes about the systems in hand and is not based on the facts but beliefs. Users base their predictions on the mental model and then perform actions. A mental model is internal to each user's brain. The mental models are in flux, i.e., they are flowing out as they are inserted in brain rather than being fixed in an external medium.

The Mixed-up Mental model –These models confuse different parts of the system, the reason is many users have not formed the model of their screen functions. The design team and the user have different mental model and while creating something for the user the design team has to think according to the user which is a very big problem.

IX. CONCLUSIONS

HCI is most likely to become the only most global research topic of the AI (Artificial Intelligence) research community. The sudden discovery in HCI design could bring radical change in the world. Many aspects of the HCI technology, which are concerned with interpretations of human behaviour at deeper level. HCI will bring a massive change in the world. Since the human computer interaction is based on the interaction of the humans with the computers, it would be more preferred as it is easy to use and is totally dependent on the humans/users and works on the users instructions. A small work in this field will ease the work of people in the upcoming time.

REFERENCES

[1] A.Dickinson, J. Arnott and S. Prior, "Methods for human computer interaction research with older people" in Behaviour & Information Technology, July-August 2007, Vol. 26, No. 4 pp. 343-352.

[2] Maja Pantic, Leon J.M. Rothkrantz, "Towards an Affect – Sensitive Multimodal Human-Computer Interaction" in proceedings of the IEEE, September 2003, Vol. 91, No. 9 , pp. no.- 1370 - 1390.

[3] Lokman I.Meho, Yvonne Rogers, "Citation Counting, Citation Ranking, and h-Index of Human-Computer Interaction Researchers: A Comparisons between Scopus and Web of Science" in Behaviour &Information Technology, Volume 59 Issue 11, September 2008 Pages 1711-1726.

[4] Jonathan Bishop, "Increasing participation in online communities: A framework for human-computer interaction" in Human Behaviour, Volume 23 Issue 4, July, 2007 Pages 1881-1893.

[5] Giovanni lachello, Jason Hong, "End-User Privacy in Human-Computer Interaction" vol 1, no 1, pp. 1-137, 2007.

