A Review Paper on Human Computer Interaction

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Abstract: *The growth of computer technology has given rise to the concept of human-computer interaction. The youthful age group of people who are educated and technically savvy is involved in research studies in human computer interaction. The mental model in Human-Computer Interaction is the topic of this paper. This review study takes many methods, one of which is to highlight current methodologies, findings, and trends in human-computer interaction, and the other is to identify research that was invented a long time ago but is currently lagging behind. This article also looks at how a user's emotional intelligence might help them become more user-friendly through fidelity prototyping. The creation and design of an automated system to carry out such a task.*

Keywords: Emotional Intelligence, Interactivity, Younger Participants, Fidelity Prototyping, Human-Computer Interface

I. INTRODUCTION

Usability is the activity and study of human-computer interaction. It's about the interaction between a human and a machine, their mutual understandings, and developing software that would make a human's job easier and that people would want to use. It is also a study of how humans utilise computers to complete specific jobs and how they interact with them in a way that is both enjoyable and effective. It consists of three pieces, namely the user, the computer, and their interaction, as the name implies. It entails sketching low and high fidelity, or the degree of precision with which a thing is reproduced. The first step is to An intelligent HCI has the ability to respond and perceive correctly in response to the user's affective feedback, as well as instinctively recognise and interpret the user's affective states. The many sorts of hci design methodologies are also discussed in this work.

II. HUMANS

The HCI product is created and used by the product's users, who are people. Memory, attention, problem-solving, learning, motivation, motor skills, conceptual models, and diversity are all important for understanding humans as information-processing systems, how they communicate, and the features of the human/user as a processor of information.

Interaction, communication, and language - Linguistic features such as syntax, pragmatics, semantics, conversational interaction, and specialised languages.

Anthropometrics is the systematic assessment of human physical features such as dimensional descriptors of body size and shape, as well as physiological aspects of people and their link to their employment and surroundings. Humans excel at completing both fuzzy and hard computations.

III. COMPUTERS

Because computers have unique components that can communicate with users, they are employed for user interaction. Computers also give a platform for users to formulate and interact with components, resulting in effective learning. Computers excel in "simple and highly defined tasks," such as counting and measuring, accurate storage and recall, swift and consistent answers, data processing or calculation, formulations, repetitive activities, and performance over time.

IV. INTERACTION

The skillsets on the list are relatively complementary. It is the process of a computer and a human interacting to produce a useful product. An interaction between a user and a computer is a two-way process.
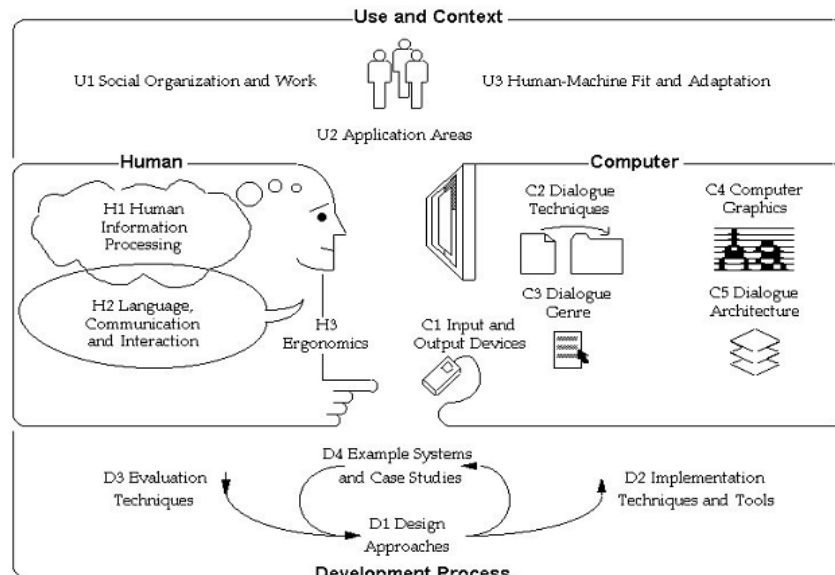
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Figure 1: HCI development

V. HCI DESIGN PROCESS

Ebert outlined four human-computer interaction design principles that can be used to create user-friendly, systematic, and instinctive user experiences. In a single user interface design, one or more techniques can be employed. The following are the four techniques to designing a user interface:

5.1 Anthropomorphic Methodology
This technique entails creating a human interface with human-like qualities.

5.2 Cognitive Methodology
This method was used to create a user interface that supports the end user and takes into account human skills. Recognition by the brain and the senses

5.3 Empirical Methodology
The usefulness of multi-conceptual designs is examined and compared using this method.

5.4 Predictive Modelling Approach
The GOMS technique examines and considers a user's experience in terms of the time it takes to fulfil a goal efficiently and effectively. GOMS stands for goals, operators, methods, and section rules, with g for goals, o for operators, m for methods, and s for section rules. The time it takes a human to achieve a specific goal is calculated using precise measures of that human's performance.
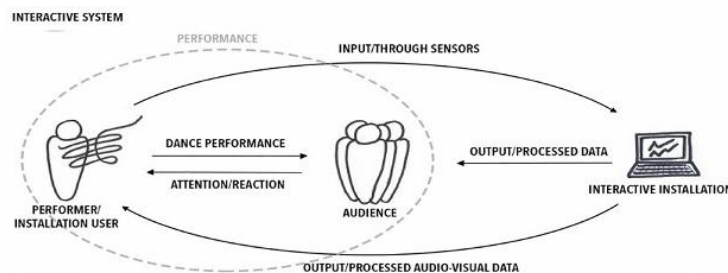

Figure 2: Interaction between human and computer

VI. FIDELITY PROTOTYPING

The degree of exactness with which a product is reproduced is referred to as fidelity. Making basic models from which subsequent models are built is referred to as prototyping. It contains the following items:

1. Low Fidelity Prototyping: Also known as low-tech prototype, low-fidelity prototyping is a basic and quick way to translate product and design concepts. It is used to convert design concepts into physical and tested artefacts, as well as to collect and analyse consumer demand at an early stage.

2. High Fidelity Prototyping: This type of prototyping is extremely functional and interactive, and it's very near to the final product in terms of features and details. It's utilised in usability testing to find out whether there are any concerns that could arise later in the workflow, such as interaction.
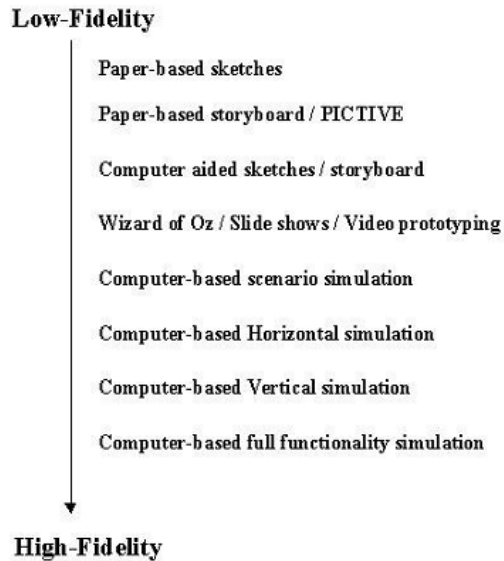
Low-Fidelity

Paper-based sketches

Paper-based storyboard / PICTIVE

Computer aided sketches / storyboard

Wizard of Oz / Slide shows / Video prototyping

Computer-based scenario simulation

Computer-based Horizontal simulation

Computer-based Vertical simulation

Computer-based full functionality simulation

High-Fidelity

Figure 3: Precedence diagram of HCI

VII. PARTICIPANTS

The younger group is frequently preferred in hci trials because they are young, technically proficient, highly educated, and unrepresentative of demographic reality. The collecting of data from older persons in study groups necessitates changes in research methodology and improvements to the data collection process. Formal education and literacy level are two variables in which the elder group of participants in the study differs significantly from the younger group.

VIII. THE MENTAL MODEL

Mental Models are the most essential notions in human-computer interactions. These mental models are what a user believes about the systems in question, and they are founded on beliefs rather than facts. Users make predictions based on the mental model and subsequently take action based on their predictions. Each user's brain has its own mental model. The mental models are in flux, meaning they flow out as they are inserted into the brain rather than being fixed in a medium.
The Perplexing Mental Model
Because many users have not established a model of their screen functions, these models confuse distinct portions of the system. The design team and the user have opposing mental models, thus while producing something for the user, the design team must consider this.

IX. CONCLUSION

HCI is most likely to become the AI (Artificial Intelligence) research community's sole truly worldwide study issue. The world could be changed forever if a breakthrough in HCI design is made. Many parts of HCI technology are concerned with more in-depth interpretations of human behaviour. HCI will have a huge impact on the globe. Because human- computer interaction is based on humans interacting with computers, it is more preferable because it is simple to use, completely

reliant on humans/users, and operates according to their directions. People's work will be made easier in the future if they do a tiny amount of effort in this field.

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