Human Computer Interaction based on Psychology and Interactive system design

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Abstract:
Human - computer interaction (HCI) is the area of intersection between psychology and the social sciences, on the one hand, and computer science and technology, on the other.HCI researchers analyze and design-specific user-interface technologies. HCI continues to provide a challenging test domain for applying and developing Psychology and interactive system design.
HCI is a science of design. It seeks to understand and support human beings interacting with and through technology. Much of the structure of this interaction derives from the technology, and many of the interventions must be made through the design of technology. HCI is not merely applied psychology; it has guided and developed the basic science as much as it has taken direction from it.

Keyword: Human-Computer interaction, usability, interaction design, psychology

I. INTRODUCTION

Human performance is an observable factor that is most often used in assessing the ergonomics of a system. Performance is function of three basic variables: speed, accuracy, and quality. Well-designed systems reduce the time that it takes for the user to perform a task. At the same time, error rate should be kept at a minimum. The severity of errors depends on their type. Some are easily correctable, others are devastating. Finally, a well-designed system should promote optimal solutions to problems. This is the ultimate goal of many systems that involve planning, decision making, design, and information retrieval. Human Factors is used to describe the study of user interfaces in their working context. It addresses the `entire person' and includes:

- Physiology, our physical characteristics such as height and reach.
- Perception, our ability to sense information, such as hearing loss and visual impairment.
- Cognition, the way we process data, such as the information we extract from a display.

II. DIFFERENT MODELS

A) The Designer's System Model

There might seem to be a trivial distinction between the designer's view of a system and the users' model of their interface. Common sense and previous experience should help

development teams to bridge this divide. Unfortunately, designers are often the last to spot usability problems. They may be so bound up in the details of implementation that they miss critical details. Many of the techniques in HCI are intended to avoid such problems. Questionnaires, prototyping, evaluations are all intended to help designers find out about the user's model of their system.

B) The User's Mental Model

It is important to emphasis that the users' model of a system will be very different from that of a system designer. Their view of an application is heavily influenced by their tasks, by their goals and intentions. For instance, users may be concerned with letters, documents and printers. They are, typically, less concerned about the disk scheduling algorithms and device drivers that support their system. Clearly, if a designer continues to think in terms of engineering abstractions rather than the objects and operations in the users' task then they are unlikely to produce successful interfaces.

III. PSYCHOLOGY

A) Software psychology

Software psychology is to establish the utility of a behavioral approach to understanding software design, programming and the use of interactive systems, and to motivate and guide system developers to consider the Characteristics of human beings. Software psychology inaugurated a variety of technical projects pertaining to what we now call the usability of systems and software. The origins of HCI in software psychology posed two central problems for the field

during the 1980s. One problem was to describe design and development work better, and to understand how it can be supported. The other problem was to specify better the role that psychology, in particular, and social and behavioral science, more broadly, should play in HCI.

B)Cognitive Psychology

Cognitive Psychology is the scientific study of human thought and the mental processes that underly behavior.

This includes:

1) Memory

2) Problem-Solving

3) Perception

4) Language

Cognitive psychology needs a common language in which to describe interaction between people and artifacts: two examples of research in progress are described, one focused on events, the other on representations and the relationship between the information display and the conceptual model.

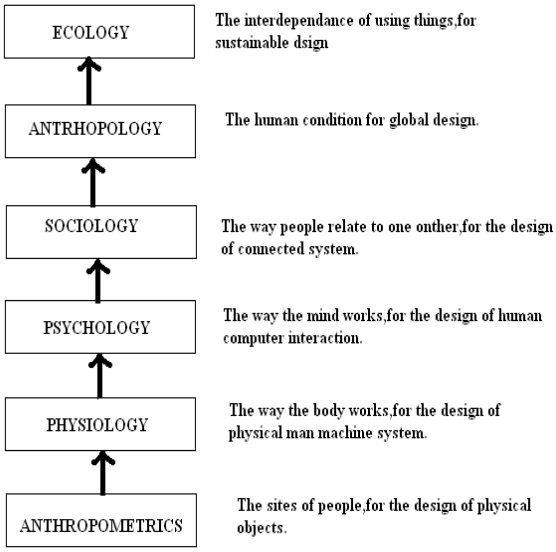

fig.1.design model based on human factor

IV. DESIGN METHDOLOGY

A) Iterative Design:

Design work is frequently piecemeal, concrete and iterative. Designers may work on a single requirement at a time, embody it in a scenario of user interaction to understand it, reason about and develop a partial solution to address it, and then test the partial solution Dall quite tentatively, before moving on to consider other requirements. The leading idea is that designers often need to *do* design in order to adequately understand design problems.

Iterative development shifted the focus of usability evaluation from the summative to

the formative. The leading idea is that designers often need to do design in order to adequately understand design problems. For example, formal and comprehensive planning and specification aids (like detailed

flowcharts) will have limited use in supporting such an iterative design process.

Through the decade of the 1980s, the inevitability of an empirical orientation toward system and software design rapidly evolved from a somewhat revolutionary perspective to the establishment view. This development provided early and critical motivation and direction for research on user-interface management systems to enable prototyping.

B) Activity theory

This is used in HCI to define and study the context in which human interactions with computers take place. Activity theory provides a framework to reason about actions in these contexts, analytical tools with the format of checklists of items that researchers should consider, and informs design of interactions from an activity-centric perspective.

C) User-centered design

User-centered design (UCD) is a modern, widely practiced design philosophy rooted in the idea that users must take center-stage in the design of any computer system. Users, designers and technical practitioners work together to articulate the wants, needs and limitations of the user and create a system that addresses these elements. User-centered design can be characterized as a multi-stage problem solving process that not only requires designers to analyse and foresee how users are likely to use a product, but also to test the validity of their assumptions with regards to user behavior in real world tests with actual users. Such testing is necessary as it is often very difficult for the designers of a product to understand intuitively what a first-time user of their design experiences.

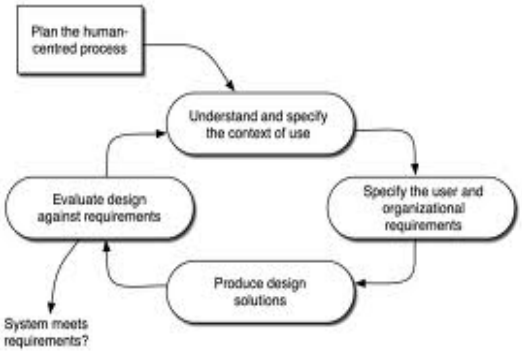

Figure 2:User-Centered Design

V. DEPENDANCIES OF PSYCHOLOGY AND INTERACTIVE DESIGN

Human-computer interaction (HCI) has traditionally been the domain of engineering

Technology and psychology. Simply using technology to solve a problem. There are three main career goal themes in interaction design:

- **Interaction Design:** For students who want to professionally design interfaces, interactive applications, social networking sites, and digital products
- **Strategic Design Planning:** For students who want to start their own design consultancies, or who want to achieve executive level positions and influence in design firms or other firms that make use of digital technologies, or who want to pioneer systemic design innovations for social good
- **Research, Scholarship, & Creative Activity:** For students who are considering a career in scholarship, as a professor or researcher

Every user having their own psychology or different think for creating new interface or object.as per their requirement they try to communicate with those object.that means interactive design is important way to communicate because each and every user having different psychology .As per the user requirement system gives him proper reply and properly interact with user do not make any changes to design.

VI. CONCLUSION

We understand that psychology plays important role for handling any system.With the help of psychology we try to create any system design to provide proper communication between system and user.Every user having their own thinking power,with the help of their knowlege they handle any system.So every sytem can give proper responce to different user is more important.

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