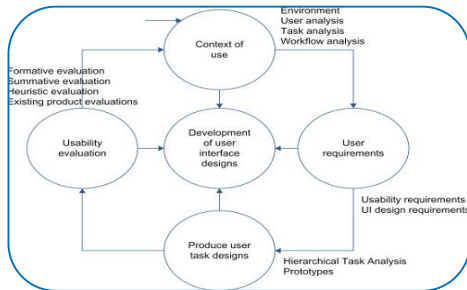




A HUMAN FACTOR BASED USER INTERFACE DESIGN



Prof. Santosh Kulkarni
 Assistant Professor,
 Prin. K.P. Mangalvedhekar Institute of Management,
 Career Development & Research , Solapur.

ABSTRACT:

The fundamental focus of current HCI research is the investigation of user interface design and development issues. Despite significant advancements in computer technology, human factors are still not taken into account. When attempting to interact with the software, the user frequently experiences confusion or frustration as a result of this. The information about the user should be used by designers to set up the interface for different users, who might have different skills, levels of experience, or cognitive and physical capabilities. A five-phase framework for a tool that designers could use to create a Human Factors-based user interface is presented in this paper.

KEYWORDS: HBUIT, collection tool, suggestion tool, user interface.

INTRODUCTION

The level of support for the underlying human activity that modern interactive computer systems provide is the feature that is most crucial. The user interface (UI) with which the user interacts with the system encompasses this level of support.

The part of a computer program that handles input from the user and output to the display is called the user interface (UI). Traditional user interface tools have taken advantage of desktop user interfaces' extremely predictable environment, as Mark Green described it. A desktop application, for instance, can safely assume that it will have access to a high-resolution color display for output and a mouse and keyboard for input [Mark Green]. The quick advancement in equipment innovation, gave such huge figuring power that the innovative work of supposed 'sci-fi' style cutting edge communication procedures turned into a reality. Virtual reality, speech synthesis and recognition, and gesture recognition are just a few examples of such methods [P.A. Cudd, R. Oskouie]. Throughout this time, various fields have worked on new conceptual designs for user interface systems.

A human factor is, in general, a physical or cognitive trait of an individual or social behavior that is unique to humans that affects the functioning of technological systems and the stability of the human-environment relationship. Human Factors considers the limitations and capabilities of humans and looks at

how people interact with tasks, machines (or computers), and the environment. It is a widespread issue that some significant issues have been overlooked in research. The majority of user interface designers focus on design issues—accessible design features are frequently overlooked. There is unquestionably a wide variety of user groups whose disabilities make it difficult for them to utilize technologies. These disabilities may be cognitive or physical. Physical disabilities have been the focus of HCI for the disabled research. [Ivar Solheim] There has been significantly less research on cognitive disability and appropriate HCI to date. In research, cognitive disabilities are the type of disability that receives the least attention and understanding. As a result, developers rarely consider accessibility when creating user interfaces. The fact that cognitive disabilities are not well-defined research areas is the primary cause of this neglect. Due to the wide range of characteristics shared by individuals with similar cognitive disabilities, these disabilities can be challenging to diagnose and characterize. A portion of the principal classes of mental incapacities include [Ivar Solheim] :

- Memory,
- problem-solving, attention,
- comprehension of language,
- reading, and math, as well as visual comprehension,
- are all important skills.

According to Boham, P., and Anderson, S. (2005), cognitive disability access is an ill-structured domain that overlaps with other ill-structured domains like usability, hci, and perceptual psychology.

Human Factors Based User Interface Design

Cognitively impaired users can sometimes use certain applications without much trouble. The designers' lack of understanding of human factors is one factor. Designers can learn from manuals, technical reports, or guidelines, among other sources. Be that as it may, generally originators need PC based plan helps which ought to be intergrated in their plan apparatuses. There are a number of user interface tools for people who clearly have physical disabilities. To reach the objective planning human component based UIs, the programmer needs astounding devices. primarily for hypermedia and graphical user interfaces. The designer ought to be able to concentrate on the design process and the quality of the final product with these tools. These tools, which aid in the creation of user interfaces based on human factors, are absolutely necessary.

HFBUIT Framework

The original GENEX framework had four phases: collect, relate, create, and donate. The HFBUIT framework is based on this.

- Take in: Learn from previous works in the library, on the internet, and so on.
- In Relation: During the early, middle, and late stages, consult peers and mentors. Examine, write about, and evaluate potential solutions.
- Donate here: Contribute to the libraries and disseminate the findings [Boham, P., & Anderson, S. (2005)].

While there are significant differences between the HFBUIT framework and genex, there are many similarities. Cognitive ergonomics, usability, human-computer interaction, and other related fields are all branches of human capabilities science. In short, HFBUIT is a fundamental method for teaching designers about human factors for innovative user interfaces. The designers' lack of understanding of human factors is the primary justification for focusing on this issue.

By focusing on human factors during the design of the user interface, our HFBUIT framework gives designers more options. Tools will be used to accomplish this. These tools make it possible to recall information from previous library work. A five-phase framework of tools that designers can use to create a user interface based on human factors was proposed in this paper.

The HFBUIT framework has five phases or tools:

- Tools for Collection
- Suggestion
- Quick Design
- Evaluation, and
- Documentation

Tools for Collection

Based on previous work, the collection tool aids in the user interface design process. The interface designers could find information and incorporate it into the user interface with the assistance of an information retrieval tool. The designers will be able to construct the final interface based on previous data, making it simple for the end user to use.

The primary reason for this is that there is a real need for libraries of previously created and tested work. Reusing the software and providing the designers with the necessary information to create a useful user interface would both result in increased productivity.

Suggestion

Human factors knowledge is presented to designers by this tool. With the assistance of documents and an expert system, the designers can receive suggestions if they require assistance in the field of human factors design. A list of comments is automatically generated whenever the expert system's supposition mechanism detects a design flaw. It shows the designers the problems that were found and gives them relevant human factors knowledge in the form of a hypermedia document or a library interaction object. The designers could enhance the user interface with the assistance of these instructions.

Quick Design

Nowadays, prototyping is regarded as an essential component of the user interface's successful construction. The designer will benefit from the assistance provided by this tool for prototyping. Prior to continuing to the improvement stage this model can be tried with clients and client can check regardless of whether the framework upto the imprint. If not, additional adjustments may be made. Early client inclusion can be exceptionally gainful. In order to complete their task, the end user can describe the system's issues. Before programming begins, issues with the UI and architecture can be identified with the assistance of the prototyping feature.

Evaluation

The Evaluation Tool will evaluate each prototype after it has been tested by a group of users. This evaluation will produce some comments that highlight the system's flaws and offer designers some suggestions for fixing them. Designers will be able to identify undesirable features in user interface units with the assistance of this tool. This instrument will check whether recently planned connection point is upto the imprint.

Documentation

Composing the archive on application Programming connection point (Programming interface) is fundamental. Programmers who want to build applications on top of that framework read the API documentation, which we refer to as API documentation. The framework's API documentation will be generated by the documentation Tool.

CONCLUSION

Our HFBUIT framework will be very efficient and offer more creative options. By making previous work easily accessible, the user's frustration may be reduced and new creative concepts may emerge. The use of prototypes, iterative design of the final product, and reviews with users of their requirements make the user an active part of the process. This makes the system more usable and makes the user happier because designers are always working to meet their needs.

The technical details and more complex examples of HFBUIT were left out of this paper because it was intended to be introductory and conceptual in nature. In order to address issues related to the usability of contemporary systems, our objective here is to establish the foundation for tools for the design of human factor based user interfaces.

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