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Evolutionary procedure and strategy of Effectual Computer Human Interface

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ABSTRACT: The most important desire of this paper is to provide the symposium on Human Computer Interface (HCI). HCI is also called as Man Machine Interaction (MMI) or Computer Human Interaction (CHI).Effective evaluation techniques of HCI cause how the users can operate the systems more effortless and security. It encompasses Introduction design process, star life cycle, user interface management system (UIMS), user experience in human computer interface, evaluation techniques and applications of HCI. Persistent use of the star life cycle, processors and evaluation techniques developed by HCI can reduce the time, cost of components, it also causes to increase the fertility and practicality in firms.. By using HCI techniques we can easily complete our tasks in a computer. It encompasses things such as interaction with the user, detecting and control of the problems and also to speed up the systems. By using this HCI technology we can reduce the complexity in applications. The basic goal of HCI is to improve the interactions between users and computers by making computers more usable and receptive to the users needs. By using HCI technology the user can easily give the input to the system and the system process that it and produces output to the user in a efficient manner, here the time taken process is very less. Hence by observing all this process we can say that, making human interaction with the computer is more adequacy.

KEYWORDS:
Star life cycle, fertility, practicality in firms. Evaluating techniques, User-interface-management-system (UIMS).

INTRODUCTION:

A Human Computer Interface (HCI) is the means of communication between a computer and the user by means of peripheral devices it may also be termed as a tool and concept that refers to a point of interaction between components and is applicable at the level of hardware and software. This allows a component to function independently while using interfaces to communicate with other components. HCI (human-computer interaction) is also called as Man Machine Interaction (MMI) or Computer Human Interaction(CHI).Human Computer Interaction (HCI) is an interdisciplinary field in which computer scientists, engineers, psychologists, social scientists, and design professionals play important roles. The 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. The course of this HCI will introduce students to proven tools and techniques for creating and improving user interfaces, such as Contextual Inquiry, Rapid Prototyping, Heuristic Analysis, and Think-Aloud User Testing. Students at the end of the course will have learned some useful techniques and an understanding of systematic procedures for creating usable and useful designs and systems. HCI has expanded rapidly and steadily for three decades, attracting professionals from many other disciplines and incorporating diverse concepts and approaches. 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.

INTERACTION DEVICES:

Keyboard, pointing devices, speech I/O , image or video I/O,USB'S, other sensory devices, mobile devices and speakers.

WHO IS INVOLVED IN HCI?

HCI is undoubtedly a multi-disciplinary subject. The psychology and cognitive science to give her knowledge of the user's perceptual, cognitive and

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problem –solving skills; ergonomics for the user's physical capabilities; sociology to help her understand the wider context of the interaction; computer science and engineering to be able to built the necessary technology; business to be able to market it; graphic design to produce an effective interface presentation; technical writing to produce manuals.

Fig (1).various fields of HCI

SOFTWARE DEVELOPMENT LIFE CYCLE:

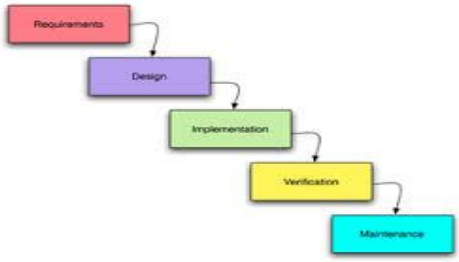

Fig (2).software development life cycle

SIMPLE INTERACTION DESIGN PROCESS:

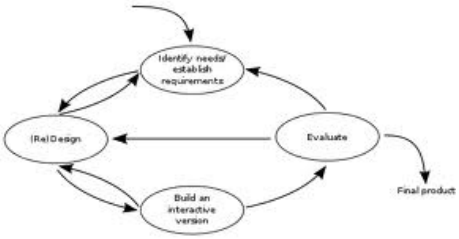

Fig (3).Design Process

There are four basic activities in Interaction Design:

1. Identify needs and establish requirements:
   - ❖ Who our target users are?
   - ❖ What kind of support an interactive product can provide?
2. **Evaluate:** In this activity we should determine usability and acceptability of product or design. User involvement must be required throughout development.
3. **Build**: Build an interactive version: It not necessary to build a software version, other possible simple prototypes include paper-based storyboard, wood.
4. **(Re)Design**: it is of two types:(i) Conceptual design: It is used to produce the conceptual model for the product ,e.g., what the product should do, behave and look like.(ii) Physical design: Detailed information of the product should be considered including the colours, sounds ,images to use ,menu design ,icon design.

STAR LIFE CYCLE PROCESS IN HCI:

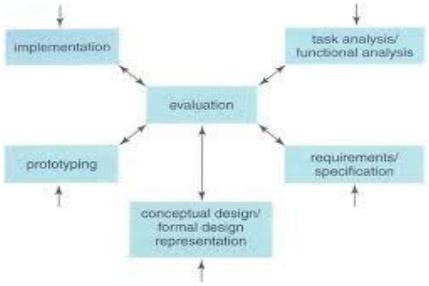

Fig (4).Star Life Cycle

Task analysis/Functional analysis: Discuss the system with the prospective users/customers. Compare it to an existing one, if there is one, and identify the weaknesses and strengths of the existing system. Detailed questionnaires to targeted prospective users. Requirements/specification: User requirements (what the user wants it to do: enter this, display that). May also include initial attempt at architectural design (how the system will provide the services).Connectional design/formal design representation: produce the basic model of the product which gives the vague idea about what product is going to do, about its functionality and its interface.

Prototyping: In this state we produce a developmental version to check that designer's ideas meet customer's requirements, and to try out novel concepts to see if they work, and so on. Prototypes are not necessarily functional, particularly if they are trying out new interface/interaction ideas - they can be mocked up, perhaps first on paper, then on the machine, before ever being attached to pieces of code.

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Implementation: The implementation may be to produce the final version, or another prototype for another round of refinement of ideas. It is sometimes the case that many prototypes are tested, until finally the design is agree. For some projects, the prototype is then discarded and the system implemented from scratch, often in a different language, with considerations of efficiency and functionality as well as interaction and interface.

Evaluation: Prototypes and near-working systems, in alpha or beta release, should be carefully evaluated to see if they meet the clients requirements and are easy, intuitive and sensible to use. It is often the case that prospective users are very different to the actual designers and so find certain things particularly difficult with the current system, and the aim of evaluating the system at this stage is to catch these errors.

USER EXPERIENCE IN HCI:

User experience (ux) is how a person feels when interfacing with a system, what he expects of your interface and system. The system could be a website, a web application or desktop software and, in modern contexts, is generally denoted by some form of human-computer interaction (HCI).User experience (UX) is about how a person feels about using a product, system or service. User experience highlights the experiential, affective, meaningful and valuable aspects of human-computer interaction and product ownership, but it also includes a person's perceptions of the practical aspects such as utility, ease of use and efficiency of the system. User experience is subjective in nature, because it is about an individual's feelings and thoughts about the system. User experience is dynamic, because it changes over time as the circumstances change.

Fig (5).Fields of User Experience

All the aspects of how people use an interactive product: the way it feels in their hands, how well they understand how it works, how they feel about it while they're using it, how well it serves their purposes, and how well it fits into the entire context in which they are using it.User Experience (abbreviated: UX) is the quality of experience a person has when interacting with a specific design. The user experience is the totality of end-users' perceptions as they interact with a product or service. These perceptions include effectiveness, efficiency, emotional satisfaction and the quality of the relationship with the entity that created the product or service.

Fig (6),User Experience Field

User Experience: Focuses on creating systems that are satisfying, enjoyable, entertaining, helpful, motivating, aesthetically pleasing, creativity supportive, rewarding, fun and emotionally fulfilling.

USER INTERFACE MANAGEMENT SYSTEMS (UIMS):

A user interface management system (UIMS) is a software component that is separate from the application program that performs the underlying task. The UIMS conducts the interaction with the user, implementing the syntactic and lexical levels, while the rest of the system implements the semantic level. Like an operating system or graphics library, a UIMS separates functions used by many applications and moves them to a shared subsystem. It centralizes implementation of the user interface and permits some of the effort of designing tools for user interfaces to be amortized over many applications and shared by them. It also encourages consistent ''look and feel'' in user interfaces to different systems, since they share the user interface component. A UIMS also supports

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the concept of dialogue independence, where changes can be made to the interface design (the user-computer dialogue) without affecting the application code. This supports the development of alternative user interfaces for the same application (semantics), which facilitates both iterative re finement of the interface through prototyping and testing and, in the future, alternative interfaces for users of different physical or other disabilities. A UIMS requires a language or method for specifying user interfaces precisely; this also allows the interface designer to describe and study a variety of possible user interfaces before building any. UIMSs are emerging as powerful tools that not only reduce development effort, but also encourage exploratory prototyping.

EVALUATION TECHNIQUES:

Evaluation tests the usability, functionality and acceptability of an interactive system. Evaluation should not be thought of as a single phase in the design process .Ideally, evaluation feeding back into modifications to the design. clearly, it is not usually possible to perform extensive experimental testing continuously throughout the design, but analytic and informal techniques can and should be used .There is a close relationship link between evaluation and the principles and prototyping techniques .This has the advantage that problems can be ironed out before considerable effort and resources have been expended on the implementation itself.

Evaluation techniques can be categorized as follows:

1. Expert-based

2. Model-based

3. User-based

1. **Expert-based evaluation techniques**: Expert-based evaluation techniques are also referred to as expert analysis techniques. It can be expensive to regularly carry out user test at all life cycle stages. Moreover, it can be difficult to get an accurate assessment based on incomplete designs and prototypes. Therefore evaluation through expert analysis. Expert analysis: designer or HCI expert assesses a design based on known/standard cognitive principles or empirical results. Expert analysis methods can be used at any stage in the life cycle. Expert analysis methods are relatively cheap. Expert analysis methods, however, do not assess the actual use of the system. Examples of expert analysis methods: Heuristic Evaluation. (HE), Cognitive Walkthrough (CW), Review-based Evaluation. Heuristic Evaluation (HE):It was proposed by Nielsen and Molich. In HE, experts scrutinize the interface and its elements against established usability heuristics [another previous tutorial] The experts should have some background knowledge or experience in HCI design and usability evaluation. 3 to 5 experts are considered to be sufficient to detect most of the usability problems. The enlisted experts are provided with the proper roles (and sometimes scenarios to use) to support them when interacting with the system/prototype under evaluation. They then evaluate the system/prototype individually. This is to ensure an independent and unbiased evaluation by each expert. They assess the user interface as a whole and also the individual user interface elements. The assessment is performed with reference to a set of established usability principles. When all the experts are through with the assessment, they come together and compare and appropriately aggregate their findings. Cognitive Walkthrough (CW): CW evaluates design on how well the design supports user in learning the task to be performed [primarily through exploration i.e. hands on].CW is usually performed by expert in cognitive psychology. The expert 'walks through' the design there are 4 requirements in order to perform the CW: specification or prototype of the system description of the task the user is to perform. Complete, written list of actions constituting the task. Description of the user (including the level of experience and knowledge)

2. Model-based evaluation techniques:Cognitive models can be used to filter design options e.g. GOMS (Goals, Operators, Methods and Selection) model can be used to predict user performance with a user interface, keystroke-level model can be used to predict performance for low-level tasks. Dialog models (e.g. STNs - see figure below) can be used to evaluate dialog problems in a user interface e.g. unreachable states, circular dialogs.

3.User-based evaluation techniques: User-based evaluation basically is evaluation through user participation i.e. evaluation that involves the people

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for whom the system is intended; the users .User-based evaluation techniques include: experimental methods, observational methods, query techniques (e.g., questionnaires and interviews), physiological monitoring methods (e.g., eye tracking, measuring skin conductance, measuring heart rate). User-based methods can be conducted in the laboratory and/or in the field.

ADVANTAGE AND PROBLEM:

HCI technology is the most advantageous for expert-users, they can quickly access commands. The main problem causing by this HCI is the programmer or user needs to learn "complex commands or language", if you don't know the commands you won't know the features. To avoid this problem we can convert that language commands into user-friendly commands using command handling interfaces.

CONCLUSION:

To design a high-quality, efficient and ease-to-use user-friendly border for an e-learning environment as a computer based system; several issues have to be considered. In the above discussion, HCI literature is reviewed as well as user-experience and evaluation techniques like specialist based, model based, user based. By this we can conclude to design a good Human Computer Interaction we have to appropriately choose the type of interface and interaction to fit with the class of users, it is considered whereas the human factors must be taken in consideration, so by we had discussed in this paper through user-experience. Types of interface and interaction styles that most excellent support the system goals. To choose the styles that is more advantageous for aimed users. Virtual reality is also an advancing field of HCI can be the common interface of the future.

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