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USER EXPERIENCE: TOOL FOR HUMAN-COMPUTER INTERACTION (HCI) DESIGN

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ABSTRACT

The changes in methodology and ideological implementation of User Experience (UX) and Human Computer Interaction (HCI) in the 21st century shift focus from traditional analogue process management to digital process management of organisations' data and content. In instance of a university interactive web portal whereby institutions provide parties with access to data and information on the university portal. A focus shift from HCI design to UX design for improved peoples' experience when navigating the institutions portal. A focus on understanding the relationship between UX and HCI as a phenomenon, considering the analogy of interactive organisation (institution, company, government) portal. Need for system developers to adopt UX evaluation, a methodology to ensure effective usability, accessibility and efficiency of a designed system. The nature of the study has its' background in HCI. HCI relate to the mental (cognitive), technology and affective factors that influence the way people use computer for interaction in a computer-supported collaborative work/learn (CSCW/L) environment. The objective of this study is to ascertain at what point or put succinctly, what stage of system development does a system developer commits to user experience evaluation methods (UXEMs)?

Key Words: Human Computer Interaction, User Experience, User Evaluation Method

INTRODUCTION

Presently, the word user experience (UX) and human-computer interaction (HCI) has a multidisciplinary scope whilst divergent understanding among UX professionals and HCI developers. Leading UX and HCI researchers and practitioners have consistently developed methodology on the practical application and evaluation of peoples' experience when interacting with the computer for further development of existing system to meet requirements in a computer supported cooperative work/learn (CSCW/L) environment.

Early developments in User Experience can be traced back to the machine age that includes the 19th and early 20th centuries. Inspired by the machine age intellectual framework, a quest for improving assembly processes to increase production efficiency and output led to the development of major

technological advancements, such as mass production of high-volume goods on moving assembly lines, high-speed printing press, large hydroelectric power production plants, and radio technology to name a few (Wikipedia, 2018).

For academic purpose, it becomes important to examine the understanding of UX as a tool in the design of HCI systems such as in the development of interactive university web portal. That is the evaluation of user experience on how people (staffs, students and third parties) interact with the work/learn (W/L) portal. Looking at UX with a system helps developers to measure Visceral (aesthetic), behavioural (pragmatic) and reflective (hedonic) for design or further improvement of the system interface i.e. the user interface (UI).

This study explores HCI and propose that HCI developers of work/learn (W/L) portal should test new methods, algorithms and architectures to enable; utility, ease of use and efficiency of the so called "qualitative socio-technical systems". It is observed that different users from different socio-technical background have different cognitive (perception, memory, judgment, reasoning, thinking) and psychomotive (coordination, manipulation, dexterity, strength, speed) ways of interacting, learning, keeping knowledge and skills.

When developing system to meet specification of users in an environment (example university, government, commerce), it should be carried out in maximum cooperation with intended or existing user(s) of the system to be developed or upgraded. There is need for in-depth exposure on scientific standards and best practices when designing HCI interface *viz-a-viz* support for cognitive (mental), psychomotive (physical) interaction design and impact evaluation of UX within the CSCW/L environments.

USER EXPERIENCE (UX) AND HUMAN-COMPUTER INTERACTION (HCI) DESIGN ISSUES

It is a fact that user experience and human computer interaction designs is seamlessly faced with challenging implementation, considering the modelling of data using instance of relational database structure as design model. The data is modelled as a mathematical relation using for example MySQL relational database management system (RDBMS), reference key joins different tables together and indexes provide rapid access to specific record in the database.

All design teams face the challenge of making trade-offs between the various requirements that they have to meet. The intangible nature of UX makes it even more difficult to estimate the consequences of design decisions on the UX. It may be very difficult, if not impossible, for the design team to deal with some issues (e.g. social, emotional or aesthetic) in a very direct or explicit way. Design teams often have to handle them intuitively, relying on professional judgments (Efe, L. et al, 2011).

Interface design by software engineers adopt different approach whilst this study identifies common grounds on challenges as user interface (UI) design and socio-technical gap.

1. User Interface Design

The planning phase is the most crucial step in creating a successful user interface (UI). It is expected that this stage handles the issues of access and restrictions to information and data, conditioned by underlying status within the HCI design. The system authorization to categories of users apparently give control to communication and sharing of potential information.

There are insoluble user interface problems here; users must be able to handle essentially an infinite information space. However, this is not merely a user interface problem; the problem is conditioned by the underlying social requirements. By the findings explicated above (going back to Goffman), people do this every day. Except in unusual circumstances, we do not have to deliberate about these information spaces in detail. Nor do we need to laboriously click and switch modes within everyday

information dissemination. To require users to do anything else than the apparently seamless change between "faces" (Goffman, 1961) is to place users of P3P within a social-technical gap (Ackerman, 2007).

2. Socio-technical Gap

The issues of socio-technical gap are a factor that impedes system usability, it is a divide between what is socially supported in a cultural environment and what is acceptable as technical standard. The scope of technical gap is inherent in online privacy and how people manage their private information about other people, companies, and institutions alike.

The social-technical gap is the divide between what we know we must support socially and what we can support technically. Exploring, understanding, and hopefully ameliorating this social-technical gap is the central challenge for CSCW as a field and one of the central problems for HCI. Indeed, merely attesting the continued centrality of this gap could be one of the important intellectual contributions of CSCW. (Ackerman, 2007)

One technical solution might be to allow users to group potential information recipients together into roles or other collections. For example, I may wish to hide my telephone number from all students, but not from professional colleagues. Unfortunately, again, by the findings explicated above, in everyday life I move people seamlessly among those groupings (especially roles). Furthermore, exceptions are common and must be accounted for – I may wish to give a prized honour undergraduate my home phone number for a consultation.

BASICS OF USER EXPERIENCE (UX) AND HUMAN-COMPUTER INTERACTION (HCI)

From review of various literature on user experience (UX), this work understands user experience to mean user involvement in systems design. And human-computer interaction HCI design to conversely mean the development of interactive interface for interaction between user and computer. Hence the design of human-computer interaction interface for users of example e-learning portal, e-government portal, e-commerce portal etc.

The UX white paper (2010) stated 'user experience' refers to an encounter with a system that has a beginning and an end. It refers to an overall designation of how people have experienced (verb) a period of encountering a system. This view emphasizes the *outcome and memories of an experience* rather than its dynamic nature. It does not specifically emphasize its individual nature because 'a user experience' can refer to either an individual or a group of people encountering a system together.

Effie, Law (2010) concludes, user experience is a research field that is still being defined. The importance of user involvement in systems design is well established by Damodaran (1996). Harris and Roland Weistroffer (2009) reported that users may have little involvement in the fundamental design and may only have limited influence on the technical functions. Yet it is the users who will know the practicalities of the task and be able to make suggestions to ensure that the design is feasible.

Alan Dix (2002) in his explanation on the roots of human computer interaction (HCI) and which areas are particularly important to it. On the one hand of an academic discipline, defined HCI to mean studying the way people interact with technology and particularly computer technology. He went further to say, on the other hand of design discipline, is how you create that technology, so it works for people.

Wikipedia (2018) explained User Experience (UX) refers to a person's emotions and attitudes about using a particular product, system or service. It includes the practical, experiential, affective, meaningful and valuable aspects of human–computer interaction and product ownership. Additionally, it includes a person's perceptions of system aspects such as utility, ease of use and efficiency.

Interaction design foundation asserts; Human-computer interaction (HCI) is about understanding what it means to be a user of a computer (which is more complicated than it sounds), and therefore how to create related products and services that work seamlessly. It's an important skill to master, because it gives any company the perspective and knowledge needed to build products that work more efficiently and therefore sell better.

PSEUDOCODE RELATIONSHIP

Below is authors concept of pseudocode relationship on the understanding of Human-Computer Interaction (HCI) viz-a-viz User Experience adjoin User Interface in a CSW/L environment.

HCI = UX * UI in a CSCW/L environment

Comment: */Human-Computer Interaction equals User Experience adjoin User Interface in a computer supported collaborative work/learn environment*/

THOUGHTS ON USER EXPERIENCE (UX) AND HCI DESIGNS

The perspective of Human-computer interaction (HCI) belong to the domain of psychology and engineering design of using technology to create a functional and usable system that meet users' requirements. It is a research-based approach for system developers whereby measurement and analysis of User Experience is necessary for design.

From personal design experience on education and corporate web portal, the philosophical thoughts on methodology when teaching and designing systems from user experience (UX) should focus on the individual, his/her perception of impact (changes, added values, costs, risks) in his/her individual situation (as a private person, as a citizen, as an employee).

Over the past years, the HCI technologies and services have witnessed an exceptional advancement (orders of magnitude) of technological connectivity of the individual (in terms of time, consumption, availability); and this technological advancement is continuous. It "seems" that the individual "feels" "socially less and less connected" (in their private lives, work/learn environments and in their societies).

On both hand of teaching and designing, research methodology may adopt qualitative observation, grounded theory and fact-finding techniques to collect user interface/user experience (UI/UX), opinions and attitudes. The UX Evaluation Methodology (UXEM) will investigate/evaluate using reflective-hedonic; one of Donald Norman's 3 levels of design appeal. This UX dimension form the landscape for evaluation of socio-technical systems.

USER EXPERIENCE (UX) AND USER EXPERIENCE EVALUATION METHODS (UXEMs)

User Experience of an interactive web portal is usually measured by several methods, including questionnaires, focus groups, and other methods. A free view of User Experience Questionnaire (UEQ) is available at http://www.ueq-online.org/. Evaluation of UX by system developers should focus and determine suitable methodology to ensure effective usability of the designed user interface (UI).

The UX white paper clarify on time spans of user experience to say; while the core of user experience will be the actual experience of usage, this does not cover all relevant UX concerns. People can have indirect experience before their first encounter through expectations formed from existing experience of related technologies, brand, advertisements, presentations, demonstrations, or others' opinions. Similarly, indirect experience extends after usage, for example, through reflection on previous usage, or through changes in people's appraisals of use.

UXEMs

Examining UX Evaluation Methods (UXEMs) focus on various established measurement scale used in various types of UX studies. The scales include experiential aspects.

User Experience Questionnaire (UEQ) is one of the UXEM's. It is a reliable questionnaire used to measure User Experience of interactive systems. The nature of the scale of the questionnaire accommodates elaborate impression of user experience. Measuring on one hand is 'classical usability aspects' (efficiency, perspicuity, dependability) and on the other hand is 'user experience aspects (originality, stimulation). Experience the look of user experience questionnaire via URL https://www.ueq-online.org/Material/UEQ_All_Languages.zip

Donald Norman's UX evaluation methods. The nature of the evaluation method is categorised as Differential Emotions Scale (DES). It evaluates three levels of Design appeal such as Visceral (aesthetic), Behavioural (pragmatic) and Reflective (hedonic). The UX dimension form the landscape for evaluation of socio-technical systems answering the question of when, what, how and why.

CONCLUSION

UX evaluation methods for effective, functional, intuitive and delightful HCI designs is a growing field of study for software engineers and psychologists around the world. There is need for strategic design approach when evaluating UX and subsequently designing usable interactive web portal for users who come from different social and technical backgrounds. Caution must be taken in adopting a suitable UX evaluation methods and usable HCI systems that leaves a lasting impression for users.

Therefore, this scientific literature proposes that UX and HCI developers should begin to test new methods of evaluation, algorithms and architectures to ensure effective designs and deliver systems that is widely acceptable to users or people within the computer supported collaborative work/learn (CSCW/L) environment. It becomes important to consider adopting one of the numerous user experience evaluation methods whilst considering socio-technical consequences of implementing a suitable technology in different culture or environment.

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