



Towards an Understanding of UX (User Experience) and UXD (User Experience Design), an Applicability Based Framework for Ecommerce, Intranets, Mobile & Tablet & Web usability

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Abstract UX Research and Design is an exciting and growing field. User Experience (UX) is a term used by researchers and professionals in many areas. UX Research is understanding of how to conduct interviews, how to evaluating systems, and analyze systems using principles of good design [2]. UX involves many subjects and it is used to describe a wide range of topics. UX Design involves the generation of good, feasible design solutions and the creation of prototypes at multiple levels of fidelity. A same product may give different impressions of user experience to different users or user groups. Hence, feedback should be generally collected from a large group of users to measure the results. By using an iterative design approach and interleaving successive phases of UX Research and Design, one can learn by making mistakes and failing fast to improve towards a product with a good UX. It is a framework with wide applicability in areas of HCI, Corporate websites, Intranets, Mobile & Tablet, Website apps/ web Usability and the growing market gives a platform for huge scope of work to be done. Also there are many UX research methods and one can decide on when to use which method.

Key words: UX Research; UX Design; HCI; Web Usability, Learning Management Systems

INTRODUCTION

Definition of User Experience

The subjective feelings of users towards the products used by them is defined as User Experience. All of us have had good and bad experiences with products used by us in our daily lives. UX research involves thinking about what makes an experience good and what makes an experience not so good and this leads to the huge scope of research in this field involving multiple subjects [2].

Features of Good UX

A good experience is a feeling about a product like a product that is useful and that helps us accomplish something that we need to want. We may want that the product is easy to learn and also that it is easy to figure out how to get the job accomplished with it. It should be useful and should help us accomplish something that is important to us. The words that we might use to describe are as follows: accessible, attractive, pleasant to look at, pleasant to interact with, fun to interact with, might help us to feel more connected to other people or to the organization or the company that's providing the service or the product, delightful and satisfying.

Characteristics of bad UX

What about a bad user experience? We might think of a bad user experience as being one that's stressful, confusing, ugly, not enjoyable, distracting, maybe it's tedious, and some systems can even be condescending, they force us to

do things in ways that don't take advantage of our knowledge and our skills and our abilities. Some systems can feel inconsiderate. And, in the end, a bad user experience is often frustrating. We leave the experience feeling worse than we did when we started.

Why is UX hard?[2]

We now know what a good user experience should look like and what we want to avoid. But why is it not always easy to do this? One of the reasons that it's hard is that designer is not the user. Even if one is a potential user of the product, one doesn't represent all the users. So it's very important to go out and understand who the users are, what they need, how they work so that one can design effectively for them. Another reason that UX is hard is because most of the time in UX we're dealing with software. We're dealing with computer-based interactive systems. And computers think differently than people do. So it's challenging to translate what works and what's easy to do for computer programmers and what's easy for computers to do into what makes sense for users is a big part of UX Design and Research. We often get it wrong the first time and we have to go through many cycles to get it right. And design of the products is usually complex because of the fact that they're software based and it's so easy to add new features. So it is very challenging to keep focus on the user experience and what users really need, especially when designing larger and more complex systems.

Steps to make UX Easy

The fact is that user experience doesn't come easily or naturally. One has to follow a certain process and has to keep certain things in mind to make sure it comes out well. But we know how to make it easier. In user experience, we have techniques that we know work to help make user experience easy. First, we follow an iterative prototyping process. As mentioned before, we usually get it wrong the first time. So rather than trying to get everything perfect right out of the gate, we try to use techniques that allow us to fail fast and learn from our mistakes. We do that by applying user centered research and design methods and we have a whole set of these that we know will work to keep the design on track and make sure that we're designing something that's going to end up delivering a good user experience. It helps to understand a bit about human behavior. One doesn't need to have a degree in psychology in order to design good user experiences, but it is helpful to know a little bit about how people work and will help us accomplish what our users need. And ultimately, we apply common sense.

The UX Process

By following an iterative prototyping process that user-centered research and design methods and knowing a bit about human behavior, we're in a much better position to use our own common sense to make good decisions when designing systems.

Fail Fast

The reason that we iterate is because we are not going to get it right the first time. We want to fail as fast as we can, get it wrong as quickly as possible, so that we can learn from our mistakes and get it less wrong each time so that we're designing a product that's getting better and better and doing a better job of delivering a good user experience.

Iterative Design

The iterative design process that we apply in user experience consists of three phases involving assessment, design, and building. Initially, in the assessment phase, we are assessing what users are currently doing and what their needs are so that we can understand the design space and the problems that they are facing and we can design products that will address those needs. In the design phase, we take what we have learned in the initial assessment and come up with lots of ideas that we might deliver a product that solves the problem that we've identified in the assessment [8]. In the build phase, we take those design ideas or a subset of those designs ideas, and we build them into prototypes or some kind of representation that we can use to communicate a particular idea. We can then use it to get feedback on whether that idea is headed in the right direction or in the wrong direction. We then apply assessment methods, like user testing or formal inspection methods, to see if that prototype is leading towards a good user experience or a bad user experience. Then we take the lessons and we repeat it all again, going back to the drawing board, designing new ideas, building new prototypes, performing new assessments and continuing all this till we're satisfied that the product is ready to be delivered.

THE PROGRESSION OF ITERATIVE DESIGN

Another way to visualize this process is to view it as a spiral where we start on the outside with the assessment phase, and we traverse around the spiral through the design, build, and assessment phase multiple times till we reach the center i.e. the endpoint or the final design. This visualization gives a sense of zeroing in on a target and getting closer and closer as one progress the design gets more and more finalized and better as time goes on.

Integrate Research and Design

Iterative design process includes both user experience research as well as user experience design and it's critical that both research and design are used in a balanced way to iterate towards a successful solution [8]. UX research has a set of methods that can be applied to understand user needs and evaluate prototypes as they're being developed.

Key Methods: UX Research

We often conduct interviews to understand more about user's needs and how they currently do things. We conduct observations to actually watch what people do and how they do it to understand things that they might not be able to tell us very effectively through interviews. Sometimes we conduct surveys, especially when we want to reach a very large audience, and we need to understand characteristics and behaviors and attitudes of that large audience. We use user testing to take a prototype or a system that we've developed and figure out whether or not people are able to accomplish what they need with that prototype or system. We also apply a range of inspection methods where we use best practices and knowledge about what works and what doesn't to take a close look at a prototype or representation of a system to determine whether it's on track for delivering a good user experience or not.

Key Methods: UX Design

We apply a set of design methods throughout the UX process. Example, developing personas, scenarios and user stories to represent the types of people that need to use the system and the types of things that they need to be able to accomplish with the system. We also use sketching and ideation to generate lots of different possible solutions and use storyboarding to visualize the interaction with a system. Mapping, navigation design methods are used to map out all the different things. We conduct a comparative research where we go out and look at the competition or other examples of products that are trying to accomplish similar things to try to understand what the best practices and the things that we want to avoid. We build multiple different types of prototypes from low to middle to high fidelity prototypes throughout the process to put those design ideas into a form that we can use for getting effective feedback and using for assessments like user testing.

UNDERSTANDING HUMAN BEHAVIOR

It is important to understand a little bit about how people work so that when we're going through the design and

prototyping process, we are creating effective product in the end. It is important to understand things like what can people perceive? How does the human visual system work? How do people extract information from visual stimuli? How can one design a screen or a web page so that people can actually understand it? How do people do things? How do people act in the world? And how do they process information about the results of their action? How do they decide on the right path? In order to design systems that guide people in the right direction and how does emotion play a role, or how, when, and why does emotion affect decision making, and what role does emotion play in user experience? So the aim is to design systems that produce satisfying positive emotions in the users. Also we want to set ourselves up so that we can use our common sense to design systems that will work. It is a process of possible designs that puts one in touch with user needs and practices and user responses through user testing and other methods that will allow one to see what works and what does not work.

Components of UX

We all know a good and bad user experience feeling. We can focus our design so that we make sure we are avoiding the qualities that we do not want and moving towards the qualities that we want. Frank Guo, wrote in UX matters (2012) and defined this really useful, simplified way of looking at user experience. He suggested breaking down user experience into four major components, Value, Usability, Adoptability, and Desirability. The methods used for designing and prototyping systems and evaluating designs can be applied to questions around the value usability, adaptability and desirability of a system.

LITERATURE REVIEW

Historically as Rogers, Sharp, and Preece (2012) stated that "There are many aspects of the user experience that can be considered and ways of taking them into account when designing interactive products. Of central importance are the usability, the functionality, the aesthetics, the content, the look and feel, and the sensual and emotional appeal" [1]. One of the widely accepted definitions of UX, as explained in usability.gov, is an aspect that focuses to understand the users' needs. It also includes the business objectives. The good UX promotes the high quality interaction between the users and the system (usability.gov). There are two approaches to study UX, qualitative and quantitative; both measurements have distinct benefits [4]. Existing literature about UEQ has the work of Santoso, Schrepp, Utomo, Isal and Priyogi (2016). They have already worked upon an adapted version of User Experience Questionnaire (UEQ) method utilized in Indonesian survey. Also the existing research of Kashfi, Nilsson and Feldt say that User eXperience (UX) is a key factor in the success of software systems. Many software development processes face challenges in their work with UX and how to integrate UX practices into existing development processes. A better understanding of these challenges, based on empirical data, can help researchers and practitioners better address them in the future.

OBJECTIVES AND SCOPE OF STUDY

The purpose for this current study is: (1) To understand the broad field of User Experience and User Experience Research and Design. (2) To apply multi- methods of UX in evaluating a system. (3) To provide recommendations for improving the quality attribute of usability for ease of use of user interfaces i.e. Learnability, Efficiency, Memorability and Satisfaction.

- The aim of this study is to develop a complete understanding of UX layout with steps for UX design for the wide range of systems.
- To use the methodology of User Experience and hence evaluate our system, choosing the test users. They will participate and provide the feedback.
- In this study, I will develop an understanding of design and process of UX for systems like B2B websites, Corporate websites, e-commerce, intranets, web usability and HCI systems.
- Moreover, the measurement results will provide additional insights into future development of the system.

Application Areas

- HCI/UX in Science-Fiction Movies/TV. Learning from the past about the Future
- Designing of User-Friendly Dashboards
- Cross-Cultural UX Design
- Mobile Phone Cross-Cultural UX Design
- Designing Digital Technology for an Aging Population
- Research Methods for Eye Tracking in User Experience Design
- Mobile Persuasion Design+ UX: Information Design plus Persuasion Design can change buying behavior

METHODOLOGY

Any research involves measurement. Also, it is an important aspect in UX. It gives an insight about user's needs, attitude and perception about the specific aspects of the system [6]. Measurement helps researchers to formally formulate the needs of system development and improvement [1]. The major focus is on choosing the best design and ensuring that the development is going in right direction and promising that it will fulfill the targeted users' needs [7]. The Research plan should include the following like data source. i. e. emphasis on gathering the primary data. Primary Data is direct collection of data from the source of information. The respondents will be all those participating in HCI, B2B websites, mobile intranets and enterprise apps.

Research Approach:

The methodology suggested for user experience analysis consists of a mixture of different quantitative and qualitative methods, e.g. the use of interviews, questionnaire, behavioral analysis, and expert evaluation [3]. Surveys are best suited for Descriptive Research. Surveys are undertaken to learn about

people's knowledge, beliefs, preferences, satisfactions and to measure these magnitudes in the general public. There are many kinds of user experience research frameworks available like Questionnaire for User Interaction Satisfaction (QUIS), The Standardized User Experience Percentile Rank Questionnaire (SUPR-Q), System Usability Scale (SUS), and Software Usability Measurement Inventory (SUMI) [1]. All of the above have their own utility as well as advantages and disadvantages in the market. To start with QUIS which is a proprietary framework and works well on general usability in a system (<http://lap.umd.edu/quis/>) [1]. QUIS is similar to SUS on the lines of generality [1]. SUS is free and simple to use for measuring system's ease of use (<http://www.usability.gov>). at the same time SUS has a scoring method and is quite difficult and the result is too general; thus, it is normally not used to conduct deep analysis. So in case detailed validation support availability is required, QUIS is a leading SUS and thus users can use the support to validate the questionnaire results accurately [1]. SUPR-Q and SUMI are the other two proprietary frameworks that give helpful tools to analyze the questionnaire result. The framework of SUMI can be used to measure the usability in a wide range of systems (<http://sumi.ucc.ie/>), while SUPR-Q is specifically used framework for evaluating websites [1]. SUPR-Q also provides the clients with a dataset of many other websites' score so that clients can compare their score to others (<http://www.suprq.com/>). The main goal of the User Experience Questionnaire (UEQ) is to allow a fast and immediate measurement of user experience of interactive products [5] (<http://www.ueq-online.org/>).

Analysis Tool: Various data analytical and visualization tools like Excel 2016, SPSS, SAS can be used in analysis and interpretation. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and conduct complex statistical analysis. SPSS is among the most widely used programs for statistical analyses, analysis in social science, Insurance, Finance, Banking, Telecommunications, Consumer packaged goods, Retail, Manufacturing, Healthcare and Market research, Government and education. SPSS is a user-friendly package and has caught up huge market.

CONCLUSION

- The work has already benefited UX practitioners, HCI educators, program and center of learning resources administrators, and learning management system developers. If we talk specifically about LMS then as of now several types of learning materials have been posted such as audio files, simulations, PowerPoint slides, multimedia contents, and webpage links. Active Learning is a mechanism where by most of the lecturers encourage students by using discussion forums in their courses. On the home page of the LMS, the Staff and faculty post academic-related announcements, circulars and notices. Responses have been collected from a large number of audience for the questionnaire [1]. In the existing research, validation results reveal that the scores for all scales describing a pragmatic quality aspect were good and the scales describing hedonic quality showed neutral evaluations. The findings were also supported by student's answers to open-ended questions [1].

The work has already been done for Indonesian environment.

- The User Experience and Human-Computer Interaction (HCI) field in India is currently growing. The current work will be part of the efforts to support HCI development in the Indian context and disseminate the significance of measurement in UX and HCI. This study will describe the process of the User Experience framework. The various methods of UX will be used to measure user experience and design of interactive products such as web-based applications (apps), E-commerce, mobile and tablet. This work will benefit the professionals dealing with the pragmatic as well as the hedonic quality aspects of the interactive products. Users will evaluate the system. The results of the study will be measured.
- The UX practitioners, HCI educators, program and center of learning resources administrators, and learning management system developers will be immensely benefitted by findings of the study. The present study may also be valuable for universities and high schools which are using computer-based learning environments. This study will not only benefit the learning management system developers, but also students in the future for better learning experiences in computer-based learning environments. This study may also be valuable for universities and high schools which are using computer-based learning environments.
- Findings of the present study will be valuable for researchers and software professionals, designers dealing with HCI, website developers, top management people as it gives an insight into improving the product and usability of the product.

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