RESEARCH ARTICLE OPEN ACCESS

Human-Computer Interaction : User Experience in Providing Online Services

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ABSTRACT
With the sudden increase in the number of mobile device users, more mobile-based services providing applications are needed. Since various marketing strategies have been used for decades as a very effective means in many traditional commerce systems, today people are looking for innovative solutions to enhance the user's experience in the wireless world. Recently, the mobile industry began to pay more attention to the applications in providing services online because the apps do not only provide an easy and simple method to present diverse services data at the same place, but also improve mobile user experience by some studies which make the development process more flexible. This paper first discusses user experience (UX) concept and then classifications, types of services provided in the proposed application which creates a successful user-centered design. The proposed application includes an initial interface for registration (either as a customer or as a service provider) and then with the help of Google Map, the customer can access services close to his or her location. Moreover, the paper also presents the application examples, and a case study using the solution.

Keywords:- Human-Computer Interaction; Human-Computer Interface; User Experience; Interface Design

I. INTRODUCTION

Mobile commerce is a business transaction using wireless devices such as smartphone or tablets. Through this technology, customers can shop, or review products of the services provided very easily and can check on different stores at the same time. Hence the reason why mobile e-commerce app has become a trend recently [1]. One of the most important design concerns in the design of an application running in a mobile device is the consistency of user experience which focuses on having a deep understanding of users, what they need, what they value, their abilities, and their limitations. This research focus is on the user experience which is the key contribution to a successful mobile application.

The rest of the paper is organized as follows. Section II describes the literature review. Section III presents the usability principles and evaluation methods. Sections IV proposed chick list. Sections V and VI present conclusions and future work respectively.

II. LITERATURE REVIEW

Nowadays, many technologies were created to support daily life [2]. Information Technology (IT) has expanded the marketplace, generated new markets, and created a multitude of business opportunities [3]. In e-commerce, users can access services from any place as long as IT is available. Currently, e-commerce is moving toward mobile commerce that allows users to do commercial activities while they are moving [4]. The user value is very critical in the mobile app value chain, so it is essential to develop a mobile app in a fashion that emphasizes the UX of the outcome [1]. UX focuses on well-being, and not performance, as an outcome of human-product interaction [5]. It is about what a person has perceived when he/she interacted with the application [6]. There is no universal standard definition of UX [4] for many reasons mentioned in [7]:

- UX is associated with dynamic concepts, including emotional, effective, experiential, hedonic, and aesthetic variables.
- The landscape of UX research is fragmented and complicated.
- There is no explicit unit of analysis for UX.

Due to the importance of UX there have been many kinds of research trying to find an explicit way of designing for UX. We learned from research that paying attention to user experience plays a significant role in business competition [8]. There are many factors that invoke experience between people, products and environment which divided into [9]:

- The user, such as value, expectation, emotions and prior experience.
- Social factor such as time pressure and pressure of success and failure.
- Cultural factor such as sex, fashion, habit, and language.
- The context of use such as time and place.
- A product such as usability, function, usefulness, and reputation.

A useful application should deliver the highest level of user expectation and acceptance [10].

III. USABILITY PRINCIPLES AND EVALUATION METHODS

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A. Emotional Design

Bevan discussed that usability definition could expand to include user experience with many aspects such as Likability as the user satisfaction with their goals achievement, including the consequences of use [1]. Norman categorizes the emotional responses to comfort and trust as the extent to which the user is satisfied with physical comfort, and the product will behave as intended respectively [2]. The most approaches to experience design system are the importance of emotional and sensual aspects as rational and intellectual characteristics [3].

B. Characteristic Error Safety

The recovery from mistakes and errors quickly and effectively is an essential principle. Moreover, the feedback information that user is received could be sufficient way to prevent error and wrong action from the user and increases the safety of the UX application [4]. Also, for reducing the bounce rates of the application, a drop-off reasons need to be understood, and on-load type errors should be tracked as they are the key to the bounce rates [5]. Safety critical systems are designed for well-implemented settlement between multiple properties such as safety, reliability, security, dependability, and usability [6].

C. Reliability

Reliability requirements need to be satisfied in UX application designing and several existing mechanisms from dependable computing field could be applied after the check of their applicability such as redundancy and diversity [6].

D. Predictability

Predictability as it is the expectations made by the user which need to be satisfied. It is achieved by trying to detect human behavioral patterns and to utilize such predictable sequences as to foresee situations of interest.

E. Consistency

The uniformity must be considered in the use of design features and be uninformed with similar systems and standard ways of working. Both conceptual and physical consistency is required in the UI design, as users should not have to wonder whether different words, situations, or actions mean the same thing. Consistency could be a tricky concept as it is relative. *For* an interface consisting of the application, the style sheets guide can be used [7].

F. Visibility

Users should always be informed about what is going on in the system and what the system is currently doing by making things are visible; people can see what functions are available. The psychological principle that it is easier to recognize things than to have to recall them should apply in the UI design whether by making it visible or even observable. Visibility can be achieved through the appropriate feedback within a reasonable time or the using of sound and touch [1].

G. Acceptability

Acceptability applies with many features: Cultural and social habits: acceptability of cultural and social habits is interested in the way people like to live. It is rude to disturb people by particular advertisements or send a spam e-mail, for example

H. Economic

Many economic issues make some technology acceptable or not. As in application that provides online services, Price is the obvious issue. However, the economic issues are more profound than that as the introduction of new technologies may completely change the way businesses work and how they make money. Norman presents the successful technology metaphorically as a stool with three legs: user experience, marketing, and technology [2].

I. Concision

The design should satisfy the users need by less complexity as possible as concision does not mean simplicity as it means reducing unnecessary elements and details. A sufficient UI design leads to a decrease

in the time taken by the user to complete the task successfully.

IV. USABILITY TESTING METHOD

Usability testing is a method used to evaluate how easy an app to use. This test is done by real users to measure how 'usable' the application is and how easy it is for users to meet their needs. A major part of survey-design research in HCI is concerned with the formulation of survey questions and scales. We used an evaluation survey as a testing method for this study. This survey aims to collect user feedback about the application usability through different usability factors. The survey as presented in Table I includes the user rating of the application usability in numbers (1 indicates Strongly Disagree, 2 indicates Disagree, 3 indicates Neutral, 4 indicates Agree and 5 indicates Strongly Agree).

Table 1.

USER EVALUATION SURVEY

	1	2	3	4	5
Was the registration process easy?					
Did you think the map is quite accurate?					
Did you find a suitable payment method?					
Was the content of the app presented in a clear way?					
Can you cancel your request easily?					
Did you think your data is secured?					
Did the app meet your expectations?					
Was the app available whenever you need it?					
Were animation and colors used carefully and only where relevant?					
Were standard components such as titles, navigation, and policy of privacy easily spotted?					
Did the layout provide more details about error messages if required?					
Were Password authentication procedures reliable?					
Were the interfaces aesthetically pleasing?					
How intuitive were the interfaces you used?					
Did you find it difficult to complete the tasks on the interfaces?					
Were the steps involved in personalizing the interface settings long?					
Were error messages clear and included precise instructions on what to do next?					
Comments:					

V. CONCLUSION

This paper focuses on the user experience that considers the key assistance to a successful mobile app. As a result of radical changes in providing services online and consumer contacts with online vendors, researchers and practitioners are keen to understand the factors that create a compelling online user experience. Once the availability and basic support needs are met, users expect a compelling experience [11]. Thus, the aim of the current paper was to develop an app based on the basis a model for online customer experiences by researching relevant literature for UX that focuses on well-being, and not performance, as an outcome of human-product interaction. The result indicates that easy application design, ease of use, observed benefits, good features, touch enjoyment, customization, social interactions, and multi-device compatibility are the precedents of the online customer experience. Services participation and frequent buying represent the results of online customer experience.

VI. FUTURE WORK

A significant amount of potential revenue is lost worldwide due to poor user experience over the Internet, leading to the lack of services provided by online for its potential. The app must "connect" users by providing compelling online experiences. Creating and maintaining online channels that inspire positive emotions and provide a compelling online experience will help to achieve a competitive advantage. In order to create a positive user experience, can borrow design signals from a cartoon or animated, that is, the dynamics of games affect the user. Also, it will make be attractive experience and enjoyable. Both interest and fun must be part of any complete user experience[11].

ACKNOWLEDGMENT

This work was carried out at the College of Computer, Qassim University, and the research is supported by Scientific Research Deanship, Qassim University.

REFERENCES

[1] Kati Kuusinen, Tommi Mikkonen. On Designing UX for Mobile Enterprise Apps. Tampere, Finland : IEEE, 2014.

[2] Jamilah, Putu Wuri Handayani. Analysis on Effects of Brand Community on Brand Loyalty in the Social Media: A Case Study of An Online Transportation (UBER). Depok, Indonesia : ieee, 2016.

[3] Sward, David. USER EXPERIENCE DESIGN A STRATEGY FOR COMPETITIVE ADVANTAGE. 2007.

[4] Golam Kabir, M. Ahsan Akhtar Hasin. Evaluation of customer oriented success factors in mobile commerce using fuzzy AHP . BANGLADESH : s.n., 2011.

[5] IM Moczarny, MR (Ruth) de Villiers, JA (Judy) van Biljon. How can usability contribute to user experience? A study in the domain of e-commerce . UNISA : s.n., 2012.

[6] Marcelli Indriana, Muhammad Leyri Adzani. UI/UX Analysis & Design For Mobile E-Commerce Application Prototype on Gramedia.com . 2017.

[7] Effie L-C. Law, Virpi Roto, Marc Hassenzahl, Arnold P.O.S. Vermeeren, Joke Kort. Understanding, scoping and defining user experience: a survey approach. Boston : acm, 2009.

[8] Soussan Djamasbi, Dan McAuliffe, Wilmann Gomez, Georgi Kardzhaliyski1, Wan Liu, and Frank Oglesby. Designing for Success: Creating Business Value with Mobile User Experience (UX) . USA : s.n., 2014.

[9] Tenzile Giil APARI, Fatma MOLU, Nur Findik, Mustafa Dalci. User Experience Approach in Financial Services. Istanbul: ieee, 2013.

[10] Mariam Azwa Yazid, Azrul Hazri Jantan. User Experience Design (UXD) of Mobile Application: An Implementation of a Case Study . Malaysia: s.n., 2017.

[11] Anil Bilgihan. Towards a unified customer experience in online shopping environments: Antecedents and outcomes. Ohio, USA:Florida Atlantic University, 2016.

[12] Petrie, Helen, and Nigel Bevan. "The Evaluation of Accessibility, Usability, and User Experience." The universal access handbook1 (2009): 1-16.

[13] Benyon, David. "Designing interactive systems: A comprehensive guide to HCI, UX and interaction design." (2014).

[14] Martinie, Célia, and Philippe Palanque. "Design, development and evaluation challenges for future mobile user interfaces in safety-critical contexts." Proceedings of the 2015 Workshop on Future Mobile User Interfaces. ACM, 2015.
[15] Griffichs, Stephen. Mobile App UX Principles-Improving User Experience and Optimizing Conversion. Technical Report. Google, 2015.
[16] Alnanih, Reem, and Olga Ormandjieva. "Mapping HCI principles to design quality of mobile user interfaces in healthcare applications." Procedia Computer Science 94 (2016): 75-82.
[17] Norman, Donald A., and Stephen W. Draper. User centered system design: New perspectives on human-computer interaction. CRC Press, 1986.
[18] Wright, Peter, Mark Blythe, and John McCarthy. "User experience and the idea of design in HCI." International Workshop on Design, Specification, and Verification of Interactive Systems. Springer, Berlin, Heidelberg, 2005.
[19] AK Akanbi, OY Agunbiade, Integration of a city GIS data with Google Map API and Google Earth API for a web based 3D Geospatial Application, South Africa, India, 2013.