

# Hybrid Application of Food Distribution: Mixture of User Experience and Systems Development Lifecycle Models

Sami Abduljalil Abdulhak, Gi-Hyun Hwang, Dae-Ki Kang<sup>1</sup>

<sup>1</sup>Corresponding author: Prof. Dae-Ki Kang (Ph.D)

Email:dkkang@dongseo.ac.kr

Dept. of Ubiquitous IT (Graduate School), 617-716, Dongseo University, South Korea  
samialkindi0708@gmail.com, hwanggh@gdsu.dongseo.ac.kr, dkkang@dongseo.ac.kr

**Abstract.** In this paper, we study the ease of use of applications that purposely develop to serve as a communication and distribution centers. Specifically, we develop an application using IBM DB2 and Visual Basic. This application serves as a food distribution application in which contains several functionalities. We attempt to blend the user experience into the development lifecycle. The result reveals that migration of user experience could significantly provide high acceptance of products from different users. Study also shows the effectiveness of the mixture by ensuring good quality outcomes. In addition, we evaluate the interface and functionalities of the application from the usability standpoint and user's perspectives.

**Keywords:** IBM DB2, Visual Basic Forms, Usability, User experience, Design, Interface

## 1 Introduction

Usability of applications has been the eye grabber for decades. It is basically concerned about applications how can be learnable and comprehensible easily to users [1]. More specifically, usability has been defined as the effectiveness, efficiency, and satisfaction of users while attempting to accomplish some specific goals in particular environments (ISO 9241). However, in other terms, technology is advanced and that leads to advancement of human being on perceiving and manipulating things in a way that is basically different from the one we have already known. Expansion of users' response and satisfaction is growing on the same curve as the technology progresses [2] [3].

General usability does not only concern about the fancy user interface but it is also concerned about the structures and architectures of the application in which allow transformability of the applications to fit different platforms and different cultures (e.g. Language) if necessary and that is called —Localization of Application|| [4].

The motive notion is —Can we develop applications that are localized and usable to various users despite their abilities?|| We try to satisfy this question by developing an application using IBM DB2 and Visual Basic 6 by adopting usability guidelines and testifying the effectiveness of these guidelines to determine if the application is being localized and usable. The remaining of this paper is organized as section 2 describes related work, section 3 articulates the application and its developments, section 4

focuses on the result and its implications, and section, and section 6 concludes the research of this paper.

## **2 Background**

### **2.1 Usability of computer applications interface**

Usability and user-experience have been recently the center of design of any applications or systems. They are basically interchangeable terminology. This indicates success of an application is radically dependent on two components —Usability|| and —User-experience|| . Usability is the main pole of any application success. Limitless, this includes the backend, front-end, structures, architecture, and accessibility of the applications. Usability of the backend is become an emergence phenomena in the recent years due to the fast transformations of operating system platforms, browsers, etc. On the other hands, the effectiveness and attractiveness of the interface is relatively upright on the architectural and narrative of the backend functional development and design [5]. From usability standpoints, interface should be visible, consistent, user-autonomy, etc as in [6]. Interface is the center channel that works as a communication panel between the applications and its users. Usability factors should be taken into considerations during the development process to ensure the effectiveness and efficiency of the user interface [7].

### **2.2 User experience in computer application interaction**

Thus, this implies that user experience is dynamic and needs to be studied more often. As mentioned previously, users' response and satisfaction are enlarged along with the growth of the technology as it progresses. There has been many studies conducted on the user experience and how to design that pleasantly meet user expectation and diversity [8] [9] [10].

User experience is a person's perceptions and responses that result from the use or anticipated use of a product, system or service (ISO 9241-210). In fact, users experience should be merged into the system development lifecycle (SDLC) to produce an effective, efficient, and ultimately satisfying. Concentrating on the quality is worthwhile of investing time in which would result in desirable and usable application.

## **3 Architectural design of the application**

We adopt the entire process of the methodology presented in [11]. This systematic development process empowers us to overly comprehend and understand the needs of users from usability stand points and user experience. Firstly, we concretely develop a star schema of the application in order to scheme the entire relationship among the entities and to simply facilitate the understanding of the application to various developers and obtain insights on how the association between entities is drawn. Figure 1 articulates the star schema we develop that represents the system as part of

the development procedures. We cluster the application into seven tables, namely, customer, agent, time, promotion, food, location, and sales as proposed by the users who would be involved in the development lifecycle to testify user experience factors. Each of the table contains several attributes or properties. These properties are refined by the users. The properties refinement is performed iteratively until final consensus reached.

## 4 Result

As a result, we provide pivot table to be launched whenever the user attempt to view certain pivot table for specific target. The pivot table is appeared in Microsoft forms. In the case where application could not be found or read, we provide user interface message to bring the attention to the users of the need application. Again, our aims are to provide ease of use and ergonomic user interface application by merging user experience into the design and development process and to develop an application that can be localized as well as usable. As a result, the outcomes of incorporating of the user experience factors with system development lifecycle is significantly fruitful in producing application that meet user expectation and satisfactions. Herein, we provide an evaluation form as the final assessment of the user interface from two expert user perspectives. Note that the assessment is performed on the basis of usability principles and parameters. As it is apparent in (Table 2.), users of the application are satisfactorily happy with user interface that is design simultaneously with the immersive user experience involvements. Definitely, one of the users evaluate the interactivity of the interface as bad, where he likely believes it is convenient to display data in horizontal forms and multiple data instead of single or double retrieval as his main concerns is the time efficiency. This indicates the variance of user preferences in looking at one application from different certain angles. As the main weakness of this study is the lack of many users' availability. Therefore, the evaluation is rather acceptable since two users assess the interface.

**Table 2. Evaluation of user-interface from usability principles aspects**  
( / as good & × as bad )

	User I	User II
Visibility	/	/
Matching	/	/
Consistency	/	×
Recognition	/	/
User-autonomy	×	×
Flexibility and efficiency	/	/
Error-prevention	/	×

## 5 Conclusion

In this paper, study shows that incorporating the users' experiences is fruitful in satisfying users from many aspects. We also find that beneath any nice looking user interface is good quality coding that runs every function properly. Steadily, quality of the coding development is determined by the ease of maintainability and readability in which enables authorized developers to perform necessary modifications or amendments. The result suggests that mixture of user experiences and system development lifecycle is highly significant to produce products that either serve users' satisfactions and desires in terms of functionalities or interface design. Based on the evaluation, users agree the developed application provides clear contents, simplicity of navigations. Furthermore, the applications rigorously present visibility of the contents and error-preventions.

## Acknowledgement

This research was supported by Dongseo University's Ubiquitous Appliance Regional Innovation Center research grants from Ministry of Knowledge Economy of the Korean government. (No. B0008352).

## Reference

1. George, M., Weinschenk, S.: Usability is Good Business. pp.1--18 (1999)
2. Hassenzahl, M., Tractinsky, N. : User experience – a research agenda. Behaviour & Information Technology, Vol (25), No. 2, pp.91—97 (2006)
3. L-C, E., Virpi, L., Hassenzahl, R.: Understanding, Scoping and Defining User eXperience: A Survey Approach. ACM CHI'09 Conf., Boston, MA, USA, pp. 719—728(2009)
4. Nielsen, J.: International Usability Testing,  
[http://www.useit.com/papers/international\\_usetest.html](http://www.useit.com/papers/international_usetest.html)
5. Bankston, A.: Usability and User Interface in Design XP. pp.1--14 (2003)
6. Nielsen, J.: Ten Usability Heuristics,  
[http://www.useit.com/papers/heuristic/heuristic\\_list.html](http://www.useit.com/papers/heuristic/heuristic_list.html)
7. Hix, D., Rex, H.: Developing User Interfaces: Ensuring Usability through Product and Process. New York: John Wiley & Sons (1993)
8. Gualtieri, M.: Best Practices in User Experience (UX) Design. pp.1--19(2009)
9. Forsslund, J. : Three Themes of User Experience in Haptic Application Design.pp.1--4 (2003)
10. Buxton, B.:Sketching User Experiences: Getting the Design Right and the Right Design. MorganKaufmann,(2007)
11. Abduljalil, S., Kang, D.: Analysis of human factors in software application design for effective user experience. Advanced Communication Technology (ICACT),pp.1446--451 (2011)
12. Scharl, A., Bauer, C.: Quantitive evaluation of Web site content and structure. Internet Research. Bradford, vol.10,p. 31 (2000)
13. Nielsen, J., Molich, R.: Heuristic evaluation of user interfaces. Proc. ACM CHI'90 Conf., Seattle, WA, pp. 249--256