Task-Oriented M-Commerce Interface Design

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Abstract. As pocket-size mobile devices are equipped with relatively small screen, when displaying web pages which are designed for personal computers and laptops, viewing poses a great challenge. Due to the limited space, items or components on the screen of pocket-size mobile devices should be much more intuitive so that users can interact with the interface more quickly. Thus, the study posits that m-commerce mandates a completely different approach, namely scenario-based design, to interface design which is task-oriented rather than functional-oriented. The result can be further summarized and compared with prior research which focused on a list of design factors.

Keywords: m-commerce, scenario-based design, interface design.

1 Introduction

Advances of technology has enabled much more satisfying internet surfing experience, as compared with almost two decades ago when World Wide Web just emerged and quickly became the widely accepted platform for e-commerce. Nowadays, being present on WWW is no longer a novel move, but a necessity for business survival. Further, with the tremendous penetration speed of pocket-size mobile devices, such as smart phones and mini pads, online experience has now extended to the tether-less world. Surfing the internet on the go is rapidly becoming a preferred life style and often a necessity of life for many people. Yet smooth transition from e-commerce to m-commerce requires that businesses recognize a major paradigm shift in web interface design.

As pocket-size mobile devices are equipped with relatively small screen, when displaying web pages and previous design procedure were deeply influenced by traditional methodologies. It is necessary to create a mobile vision of web interface with better considering the characteristics of pocket-size mobile devices.

The objective of the study is to identify critical tasks while designing web interface for pocket-size mobile devices based on a task-oriented methodology, namely scenario-based design. Due to the complexity of scenario-based design, all the design phases should be taken into consideration. Thus, three rounds of focus groups will be held in order to collect ideas and opinions from participants. In the future, the result will be summarized and compared with prior research which focused on a list of design factors, to demonstrate the feasibility of a scenario-based design for m-commerce user interface.

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2 Literature Review

2.1 Design Factors for E-Commerce Website

In the field of interface design, researchers have made much effort to identify critical design factors. For example, Cyr [1] found that website navigation design, website visual design, and website information design had positive effects on website satisfaction. Javenpaa and Todd [5] summarized four aspect of functional factors, including product perception, shopping experience, customer service and consumer risks. Wan [14] proposed four categories of factors that affected website quality, namely information, friendliness, responsiveness, and reliability. Furthermore, Zhang & von Dran [15], Liang & Lai [9], Huang & Fu [4] utilized Herzberg's two factor theory [2] to improve websites, to attract customers and even to make customers to revisit the websites by identifying hygiene and motivation factors [13,15]. While hygiene factors refer to the necessary functionality and increase the degree of customer's willingness to visit the website, motivation factors motivate users to revisit the website.

Besides, Zhang and von Dran [16] stated that different types of websites should pay attention to different factors, and that some factors which are critical to one type of website may not be suitable for another. Whether a design factor is critical or not may depend on the website type. For instance, the top five factors of e-commerce website are data security, easy to navigate, appropriate explanation, search tools, and the price of product and service, respectively.

2.2 The Framework of Mobile Commerce Interface

With the bloom of mobile telephony, people gradually get used to browsing websites with mobile devices. However, the interface of traditional website which was designed for PC or laptops does not fit the small screen of mobile devices. Thus, using pocket-size mobile devices to browse traditional e-commerce websites will encounter difficulties. As the study of interface design for mobile commerce was just emerging, Lee and Benbasat [8] summarized previous research and proposed the framework of mobile commerce interface, in which seven design elements of the framework were presented, including context, content, community, customization, communication, connection, and commerce.

Basically, a "commerce" interface or website must provide a safe purchasing environment. "Context" and "connection" indicate that designers should put appropriate links to let customer navigate smoothly and achieve their goals easily. "Content" and "customization" refer to the web page should provide the nearby users with specific information. "Community" represents that it is necessary to provide a way for people to exchange information in m-commerce interface. Finally, "communication" is the feedback between customers and organizations. Thus, according to the feedback, organizations can improve services, and customers can get useful offerings or promotions.

2.3 Scenario-Based Design

With the tremendous progress of information technology, the interactive systems become more and more popular. Designers have paid more and more attention to users' real requirements and preference. However, in interactive systems, some requirements are not definite enough and it is difficult to acquire those requirements in the early stages. In this regard, the focus is shifted to the system usability, which includes the concepts of ease of learning, ease of use, and user satisfaction [12]. Besides functional requirements, there are still some non-functional requirements such as portability, reliability, and maintainability that will finally influence system usability. On the other hand, factor-based design concepts described above seem to follow the traditional system development life cycle. Users are not highly-involved until prototype system is implemented. Once users are not satisfied with the prototype system, designers need to adjust or even come back to redesign the system. Consequently, in order to improve this phenomenon, scenario-based design is a better methodology to conduct our research and to identify appropriate tasks which can be integrated into m-commerce websites.

Scenarios are just like stories and emphasize the coordination of information resources and data. Besides, scenarios have several significant elements including setting, agents or actors, goals or objectives, and a plot. The framework of scenario-based design is consisted of five steps, including developing problem scenarios, designing activity scenarios, designing information scenarios, designing interaction scenarios, and evaluating prototype. First of all, by analyzing requirements appropriately, a problem scenario, which describes the practical activities that need to be revised and improved, will be proposed. Second, activity design will be developed based on the problem scenario. More specifically, designers need to develop a proper and specific solution to improve current activities and utilize information technology wisely. The objective of activity design is focusing on system capability including both functional and non-functional requirements rather than user interface design. Third, information design includes general data on the interface and visual elements such as dialog boxes, icons or menus. Also, Designers should make a good arrangement of elements on the screen, and confirm the meanings of all objects' representation. Whereas the focus of information design is to present all design elements on the screen clearly, the objective of interaction design is to help people execute their tasks smoothly. Finally, in order to evaluate the design idea, a prototype system will be implemented and verified. Although many design elements are not well-defined yet, users can evaluate the design by using both the scenarios and prototype. According to the result of evaluation, designers get an opportunity to further improve their design.

3 Research Method

The study intends to apply a task-oriented approach, namely scenario-based design, to identify critical subtasks while designing m-commerce interface for pocket-size mobile devices. Numerous potential issues should be considered in designing user interface, including synergism, stimulation, security, spontaneity, and snowballing

[3]. To make sense of what issues matter the most in helping users accomplish tasks, this research employs three rounds of focus group studies [7] to conduct each phase of design.

Participants should be familiar with the use of pocket-size mobile device and have shopping experience on the e-commerce website, because experienced users can easily comprehend the problem and propose more ideas for the revision of the design in each step of scenario-based design. In addition, as Morgan [11] suggested, a small group is more efficient and effective for complex problems. Due to the complexity of the scenario-based design, we use a small group design process. There are nine members in the focus group. This is in accordance to Merton, Fiske, and Kendall's [10] suggestion. In order to allow full discussion, two to three hours are allocated for each round of focus group study.

Topic and question approach are two important portions to generating focus group questions [6]. The study tries to develop detailed questions regarding scenarios in order to handle the whole process perfectly and to analyze easily. Also, our questions should stay away from technical language, be brief and specific [7]. In the study, there are five types of focus group questions, including opening questions, introductory questions, transition questions, key questions, and concluding questions [7].

The study will focus on four steps of scenario-based design. However, because presentation and execution frequently happen simultaneously, information design and interaction design will be conducted in the same session. Therefore, as each step has its specific objective, our study will conduct three rounds of focus group to obtain detailed information corresponding to four steps of scenario-based design.

In the first session of focus group, the focus is requirements analysis. The study will conduct the focus group to generate problem scenarios and claims by asking all participants questions, observing their reactions, and even drawing diagrams. Problem scenarios refer to the detail descriptions of current activities, while claims are the advantages and disadvantages.

In the second round of focus group, the study intends to conduct activity design which includes functional and non-functional features. By referencing problem scenarios and claims, participants can specify their design ideas deliberately with appropriate information technologies. Metaphors and useful information technologies will be identified in this step. The output of this session includes activity scenario and claims.

In the last round of focus group, information design and interaction design will be conducted simultaneously. While the purpose of information design is to arrange appropriate elements on the screen for enhancing user's perception, interpretation, and making sense of what they see, the goal of interaction design is to construct a list of user interaction and system response step by step. Interaction design will focus on how to use and operate the system. Participants can combine these design ideas to construct both information scenarios and interaction scenarios. Besides, claims will be improved synchronously in order to help the study to retain advantages and remove disadvantages.

After summarizing the findings in three sessions of focus group, the result will be further compared with prior research which focused on a list of design factors.

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