

Adaptation of Cognitive Walkthrough in Response to the Mobile Challenge

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INTRODUCTION

Cognitive walkthrough (CWT) is a usability inspection method which allows users to learn a system by using it to achieve tasks rather than studying a manual or documentation. It starts with a task analysis that specifies the sequence of steps required by the users to complete a task, and the system responses to those actions. The users then walkthrough the steps as a group and questioning themselves at each step. Data and information are gathered during the CWT and potential problems are identified. However, problems rose if the CWT and user based evaluation were being conducted in the mobile context environment. It became clear that static lab is not ideal for the CWT to be carried out by the evaluators to consider the behavior of the mobile interface, its impact on the user, and judge whether the user would be able to perform the tasks which features mobility. Although the CWT is suitable to be conducted during the early stage of the mobile device development because they can be performed using a system specification as a basis, the context factor that reflects the mobile challenge should take into the consideration at this stage and CWT should make adaptation in respond to this issues. This is due to that the evaluators will use the device in different ways depending on the situation such that the CWT might work fine in the controlled context environment without side influences or other context challenges factors, but it might not goes the same with the situation where the CWT is being conducted on the run or in the field. All the context consideration will have an impact for the usability solution and content suitability.

MOBILE CHALLENGE

Context Challenge

As the traditional usability tests on applications are being done using stationary computers, the context is

controlled and not specifically relevant. The computers in the labs are more or less in the same context as when they are used in offices and homes (Lindroth & Nilsson, 2001). According to Johnson (1998), usability testing in a lab with controlled situations and tasks works for applications used in stationary solutions and this performs fine with the solutions where the context and environment is of second interest. For mobile devices, testing might make the result irrelevant since it fails to take the context of its use into consideration (Lindroth & Nilsson, 2001). However, problems rise since context plays an important factor for the usability testing of a mobile solution. The impact of use context to the usability of a product is strong and it is an especially important question in design of portable or mobile products, which will be used in several environments (Dr. Sade, 2002). According to Vaananen-Vainio-Mattila and Ruuska (2000), there are three levels of use context for mobile phones and communicators. The mobile infrastructure context deals with technical issues, such as the network coverage or low communication bandwidth. Second, the physical context is about: for example, noisy surroundings, the freedom of being truly wireless, varying physical usage positions, the demand for small physical size of the device, sharing one's attention between operating the device and other issues, the varying environmental factors concerning light, clothing and so forth. The third contextual dimension is the social context. The interaction is shaped by the need to take other persons into account—the ones who are communicating with the user and the ones who are in the same physical location with him or her. According to Howard (2003), there is another type of dynamic use context which is digital context for example the network infrastructure and communication with other devices. All these considerations have an impact on solutions for usability, physical ergonomics, the suitable types of content for the interaction channels and many other issues.

USER-CENTERED DESIGN (UCD)

User-centered design (UCD) approach aims at high-quality design and utilizes several methods to take users' actual needs and desires in account (Dr. Sade, 2002). UCD methods are one tool for creating devices and services that are really needed, useful, and suitable for the media. The cognitive walkthrough method of usability testing combines software walkthroughs with cognitive models of learning by exploration. It is a theoretically structured evaluation process in the form of a set of questions that focus the designers' attention on individual aspects of an interface and that make explicit important design decisions made in creating the interface and the implications of these decisions for the problem-solving process. The techniques that being used in UCD are classified into three groups—information gathering and analysis, solution generation and solution evaluation (Dr. Sade, 2002).

Solution Evaluation: Cognitive Walkthrough (CWT)

One of the expert inspection methods include cognitive walkthrough (CWT) which is a theory-based process where a group of evaluators go through a detailed description of the user interface. They have a task scenario and explicit assumptions of the user group and use context (Dr. Sade, 2002). CWT technique can be used to evaluate a complete system, a prototype, a system of which the user interface is not yet complete, or only a specification (Almedia, 2002). CWT method was designed to evaluate the learnability of software interfaces without the overhead of full-blown empirical usability lab testing and the CW can be applied early in the design process because it can be applied when only the user interface is specified- it is valuable for evaluating learnability of the integration of features when those features are at various stages of development. Before the CW session, the usability professional is responsible for defining the important user task scenario or scenarios and producing a task analysis of those scenarios by explicating the action sequences necessary for accomplishing the tasks in the scenarios and the first step to convene the walkthrough is to describe the goals of performing the walkthrough. CWT leads the designer to consider factors such as users' backgrounds, etc.

ADAPTATION OF CWT TO RESPOND TO THE MOBILE CHALLENGE

The main problem with the context adaptation is that the context cannot be easily identified or measured (Eija, 2002). However, context awareness is crucial in using the mobile device as it enables the mobile device to provide assistance based on the knowledge of its environment (Pascoe, Ryan, & Morse, 2000). It provides a method of automatically recording, presenting and filtering information through knowledge of the user's current environment. In addressing the context awareness problem while using CWT, few adaptations are suggested. Accordingly, the adaptation includes the following significant changes:

- a. Instead of conducting the CWT in the lab for the evaluators to evaluate the mobile device, the activities should be carried out on the run in terms of field testing to expose the evaluators to the real mobile environment. Evaluators can go through the usability expert testing method by dealing with the context while considering other factors such as users' backgrounds, knowledge and etc. According to Lindroth and Nilsson (2001), evaluators might complete the task in different way if the test is being carried out outdoor instead of in the indoor controlled environment. In this way, the evaluators can deal with the technical issues such as network coverage or physical context such as noisy surroundings and varying physical usage positions. Evaluators can go through the CWT complete with interruptions, disruptions, and distractions as the influence of environment is often a critical factor in the usability of the device.
- b. Some types of role players are being asked to interact with the evaluators while they are doing the CWT. A good example will be confronting with the evaluators as part of the test and take on different roles to share the evaluators' attention between operating the device, completing the task and some other issues. This will expose the evaluators to the social contextual dimension where the interaction is shaped by the need to take other persons into account. For example the ones who are communicating with the evaluators or the ones who are in the same physical location. Role-play is a method used when designing new

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