Mobile Guide Technologies (Smartphone Apps): Collaborative Heuristic Evaluation (CHE) with Expert and Novice Users

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Abstract—**Providing quality and meaningful experiences to the users are vital particularly with the devices that users are familiar with. Usability issues should be discarded before the systems/designs are deployed to the users. In this study, we compared the usability issues found by expert and novice users using Collaborative Heuristic Evaluation (CHE). This study was carried out with 6 experts and 9 novice users. There are 3 different mobile guides used in this study, 2 were designed to be used in museum and another mobile guide was designed to be used at a tourist attraction. Results showed that expert users found significantly more heuristic problems than novice users during the CHE procedure across the 3 different mobile guides (smartphone apps). On the other hand, there were heuristic problems found by the novices that were not noticeable to the expert.**

Keywords - collaborative heuristic evaluation (CHE); mobile guide technologies, heuristic evaluation, expert, novice

I. INTRODUCTION

The vast development of digital technologies, particularly mobile guide technologies, has shaped how users interact and use such technologies for different purposes. For example, mobile technologies are being used as a communication and collaboration tool between individual and groups. In addition, mobile guide applications also provide a platform for users to interact with the technology itself. As a result of these communication, collaboration and interaction, it could possibly have an effect on the users' overall experiences. As a result, users have a low tolerance for apps/systems that have various usability issues. The interaction and communication between people and technology, or between groups of people with technology, are not limited to workplaces or the home but also includes other places of interest such as museums, historic churches, art galleries, historic houses and archaeological sites as well other tourist attractions. Hence, there is a dire need for the developers to assess their mobile guide technology before it reaches the real users.

A good system usually does not contain any obvious usability issues and is considered to have a high usability level. Hence, it is important to perform different types of evaluation of the system (Smartphone Apps) before it could be used in the real settings.

Heuristic evaluation is a widely-used and well-known usability assessment method and remains widely used [1-3]. It served in this case to identify any problems with the user interface of the system. Previous researchers introduced a more comprehensive heuristic evaluation called Collaborative Heuristic Evaluation (CHE) to address issues highlighted by heuristic evaluation accumulated over the years [4]. This study explores the use of CHE as a method to eliminate the common and unnoticed usability issues with the mobile guide (smartphone apps) before it is deployed. A study by [5] highlights the importance of conducting the heuristic evaluation on the smartphone apps before it can be deployed to the users. A CHE with experts in study [5] discovered 39 usability problems with one smartphone apps for mobile guide tour. This study is different because it used both experts and novices as the evaluators.

II. BACKGROUND

A. Usability Evaluation and Heuristic Evaluation

Usability evaluation is an invaluable tool to ensure the quality of computerized systems [6]. Kjeldskov et al, also identified different aspects that need to be addressed for mobile guides' usability evaluation such as location, participants and resources and surrounding. Researchers in this study performed four different usability testing method which are field-evaluation, laboratory evaluation, heuristics walk through and rapid reflection onto the functional prototype for IPAQ handheld computer (mobile guides). This mobile guide prototype was developed for Melbourne's tram system.

It is important to test the system for any known errors or interface issues before the system can be tested with the users. Heuristic evaluation is considered as a discount method for quick, cheap, and easy evaluation of user interface. It is also known as 'discount usability engineering'. Although some evaluators have a better knowledge than others in conducting heuristic evaluation, it is not necessarily that they will consistently find more usability problems on every system that they evaluated [7].