Chapter 7
System Usability Scale Implementation for Interfaces on Mobile Touch Screen Devices Assessment

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ABSTRACT

The indisputable fact is that touch screen mobile devices flooded the marketplace and that they have become an essential element in the enormous number of fields and applications. But a huge presence, as well as daily use, does not necessarily unambiguously reflect their optimal usability. Therefore, it is essential to adopt appropriate research methodologies that can evaluate the usability of mobile device interfaces. The main focus of the study was to examine a practical tool for usability assessment in a mobile work context which has to be simple and above all, proved to give a single score as its outcome. To achieve this goal System Usability Scale (SUS) was applied to test the Tablet PC usability. This study contributed with the proposal of a framework for usability testing which could help, both practitioners and researchers to make decisions how to improve the usability of interfaces on touch screen mobile devices.

INTRODUCTION

The fact that mobile devices with touch screens flooded the marketplace is indisputable, so they have become an essential element not only in the field of entertainment and ubiquitous information exchange, but also in the business environment, and most of all, they are currently much more represented in the field of education.

But a huge presence, as well as daily use by various populations, does not necessarily unambiguously reflect the optimal usability of these devices. Taking into account that the motives underlying
the choice of touch screen mobile devices, ranging from mobile and smart phones, to the Tablet PCs, are very diverse, and often under the influence of comprehensive advertising, a need arises to examine how useful these devices really are for all these users. Although these applications offer a number of advantages in terms of portability and convenience, it could be that they do so at the cost of usability. This paper is aiming at shedding light on one among the most popular mobile devices – Tablet PC usability measurement framework.

Although a fairly substantial body of research has grown up in the last few years on desktop and laptop usability, very few studies have reported on experiments with tablet PCs (Alvarez, Brown, & Nussbaum, 2010). Tablet PCs, mainly differ from touch screen mobile phones by having larger screens, which candidate them for much complex operations. Also, the fundamental difference between this kind of devices and regular PCs is the input method, regarding the usability. With direct manipulation, users can handle files and other objects as icons, dragging and clicking them by fingers instead of using mouse and similar input devices. Hands-on and tactile experience allows fast learning of the basic functions and gestures such as tap and swipe (Pekkala, 2012). Nevertheless, there are some problems with using gestures as an input method: the lack of established standards for gestures and their actions and the developers’ ignorance about the universal usability principles (complying also with the new devices) (Pekkala, 2012). Gestures are non-standard, imprecise and unrepeatable by their nature as non-verbal communication. Tablet PCs have solved this problem caused by a lack of feedback, by integrating elements from the traditional Graphical User Interface (GUI). Still, there are some typical problems related to the size of touch screen display: a smaller screen reduces comprehension because users have to rely on their memory when trying to understand the content not fully presented within the viewable space. Also, they must scroll more frequently in order to reach the other parts of the content instead of simply glancing. Scrolling actions consume more time, leading to disrupting the order of memory sequences. It introduces the new problem of reacquiring the previous location on the display (Nielsen & Norman, 2012).

The facts mentioned above emphasize the need for systematic user experience evaluation, both in industry and academia. In this way, user experience evaluation has gained increasing attention in Human-Computer Interaction (HCI). Without means to evaluate user experience, it is impossible to manage experience related aspects. When we aim to improve a system or want to gain an understanding of the user experience, we are also interested in users’ perceptions of the product’s qualities and their overall evaluative judgments of it (Väänäjä, Koponen, & Roto, 2009). To be able to reach beyond studying the instrumental aspects, practical tools that support the assessment of user experience are needed. It is still unclear what the appropriate methods and metrics are required for assessing user experience. This is partly due to the fact that there is still not an agreed definition for user experience, although standardization work is ongoing (Väänäjä, Koponen, & Roto, 2009).

Since traditional guidelines and methods used in usability testing of desktop applications may not be directly applicable to a mobile environment, it is essential to develop and/or adopt appropriate research methodologies that can evaluate the usability of mobile devices. Therefore, it is crucial to implement user experience evaluation tools in such a way that they could efficiently assess the usability of interfaces. Bearing this in mind, the goal of this chapter is to consider the implementation of the System Usability Scale (SUS) as one of the most commonly employed tool, in evaluation of mobile devices interface usability.

This chapter is structured as follows. After initial introductory considerations literature review upon mobile devices and usability in this field will be briefly summarized in Section 1. Afterwards, in Section 2 the fundamental concepts and challenges of usability testing of mobile applications are introduced. Section 3 of the chapter outlines the case study conducted to investigate the usability of Tablet PC de-