Chapter 26
Impact of Evaluating the Usability of Assisted Technology Oriented by Protocol

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ABSTRACT

The main objective of this research is to provide a procedure set, oriented by a clear and rigorous protocol that allows the replication of results regarding the accessibility claims of products and systems available for the blind community, thus validating their robustness. The goal during the experiment was to compare user preferences and effectiveness when performing tasks with the voice synthesizers JAWS and DOSVOX and a braille keyboard. The adopted evaluation protocol includes the following methods: usability testing, focus group, and user satisfaction survey. The study developed with the proposed protocol investigates assistive technology adequacy to target users. The tasks performed by 30 users were categorized as activities of entertainment, learning, and social inclusion. It is considered that the main contribution of this chapter is to provide the protocol and methodology, adapted for use in evaluations of accessibility products and devices.

INTRODUCTION

Accessibility has become a major concern of computer system developers. However, unlike its counterpart usability, there is no established protocol that can be used to evaluate the quality of products and systems developed for particular users or communities.

For many interactive software systems, a large part of the interaction between user and technology depends on the use of visually presented material (ISO, 2008). In particular, the individuals typically use the keyboard, mouse, or other pointing devices to provide information and various screen types as output devices. On the other hand, blind or visually impaired users employ their auditory and tactile senses as visual sense. In this case, the typical non-visual forms of interface used in interactive software are auditory or tactile (Sodnik, Grega & Tomazic, 2011). Screen readers, the software tool most commonly used by visually impaired users, are based on speech synthesizers that read the contents of the computer screen using synthesized artificial speech (Chen & Raman, 2008).

Although the scientific literature presents several studies evaluating the accessibility and usability of assistive technologies for blind people (e.g. (Sanchez & Hassler, 2017; Pascual, Ribera, Granollers & Coiduras, 2014; Ferreira, Silveira, Capra & Ferreira, 2012)), a general experimental protocol able to be instantiated for the evaluation of different devices and systems is still lacking. Targeting to overcome this issue, the present chapter presents an experimental protocol that provides a script with procedures that is aided by documents that guide the evaluator during experiments planning and conduct.

Successfully designing universally accessible interfaces requires technical and cultural changes and strategic commitment: Usability and accessibility must be an objective of system development (Queirós, Silva, Alvarelhão, Rocha & Teixeira, 2015).

In a general way, there are some examples of how Human Computer Interaction has been shaping the new demands of market, social, economic and user specificities, which is very clear in several studies (Smith-jacksonb & Hartsona, 2009; Jokinen, 2015; Findlater & McGrenere, 2010).

In terms of accessibility: software should be as accessible as possible so that it can be used by as many individuals as possible, including people with physical, mental or sensory disabilities.

Some people cannot see clearly or distinguish certain colors, and some cannot operate a normal keyboard or mouse. Access to sites of the future by people with physical disabilities requires new forms of interaction based on the use of, for example, voice.

Software should be inclusive and universal, so it favors not only the disabled people, as well as all others, whether they have a limitation or not.

The evaluation of usability applied to the universal project brings impacts in different areas, among which are:

- Multicultural interfaces: these are factors to be analyzed in the new conceptions of interfaces. Creating a solution that is usable by people in many different countries and cultures is a great challenge. The reader should be led to understand that creating a version for a specific group of users based on language or location could be important, just as colors and icons have different representations for different cultures (Miah, 2004).
- Multiplatform software: which is a technological challenge for programmers to adapt their software to be used by different software platforms. It is noted that in many cases, the newly developed software needs to run on several platforms and integrate with each one of them. The main problem

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