Sustainability Factors of Accessible Information Systems and Technologies (IS&T)

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1 INTRODUCTION

Current global competitive landscape requires organisations to act more efficient and productively. Over two decades ago, organisations gained this required boost of efficiency and productivity by simply applying IS and T, as this innovation was scarcely available. Today however, IS and T is a commodity good, easily accessible by every organisation (Carr, 2003). Competitive advantage through IS and T no longer depends solely on hardware or software components. Instead, the user and his capability to interact with IS & T entered the limelight. Catchwords such as usability, user experience or user acceptance gain more and more importance to organisations. Above these catchwords and other business activities, sustainability becomes more significant for organisations and governments, as e.g. consumers started to consider sustainability factors of products (Society for human resource management, 2011). Putting together, organisations confront the challenge to develop or deploy sustainable IS and T that meets the users' requirements.

2 BACKGROUND

The analysis of user requirements is a crucial process for ensuring efficient and productive human-computer interaction (Isacker et al., 2009; Crowsten et al., 2006). In this process the selection of target groups who will work with the IS is of major importance (Marmaras & Nathanael, 2012). A wrong selection of target groups will cause discrepancies between the IS and the users' requirements and/or capabilities and thereby will decrease efficiency and productivity. For example, visually or physically impaired users possess different capabilities and therefore have different IS and T requirements. The susceptibility to disabilities becomes higher with increasing age (Lutz & Scherbov, 2005). Therefore, target group selection is a treacherous issue nowadays, since population structures of western industrial nations like Germany, France or United States of America will dramatically alter over the next decades (Lutz et al., 2011). For example, from 2010 to 2050 the proportion of elderly people over 60 years will increase from 26 to 37.5 per cent in Germany, 18.4 to 26.6 per cent in the United States of America and 23 to 30.5 per cent in France. At the same time the percentage of people aged 15-24 declines respectively stagnates in most western nations (United Nations, 2010). As one consequence the proportion of people with disabilities living in these communities is likely to increase (Redfoot & Houser, 2010). In addition, life expectancy rates rise drastically during the next decades (European commission, 2012). These demographic alterations mean a serious challenge for western economies. The average age of the working age population, as well as the mean age of employees within organisations will increase (Van Dalen et al., 2010). On the other side, a substantial proportion of buying power shifts to the elderly and disabled population. To maintain and enhance sustainable competitive advantage organisations need to adapt IS and T related products and services to the requirements of new promising target groups such as elderly and disabled people.

The next section will introduce technical methodologies that support the development of appropriate IS and T for elderly and disabled people.

Table 1. Accessibility definitions

1. International Organization for Standardization (ISO)	2. Web Accessibility Initiative (WAI)	3. German Equality Law
"The usability of a product, service, environment or facility by people with the widest range of capabilities" (ISO, 2008).	"Web accessibility means that people with disabilities can use the Web. More specifically, Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web. Web accessibility also benefits others, including older people with changing abilities due to aging" (W3C, 2005).	"Facilities, vehicles, technical objects of utility, systems of information processing, acoustical and visual information resources and communication devices are accessible when disabled people are able to use them in a commonly used manner without significant difficulty" (Behindertengleichstellungsgesetz, 2013).

3 IT-ACCESSIBILITY

3.1 Definition

IT-Accessibility is not a new topic in the fields of IS and T. When Tim Berners Lee invented the World Wide Web in 1989 one part of his vision was to make the platform available and accessible to as many people as possible (Thatcher et al., 2006; Design Museum, 2007). Especially the last part of his vision "to as many people as possible" is a question of interpretation. Similar to this, plenty of different definitions for the term IT and Web-Accessibility arose over the last 25 years. Three of these definitions shall be presented in Table 1.

Each of these three definitions contains varying levels of information on accessibility. While the first definition tries to describe the term on a very abstract level, the second definition describes accessibility for both disabled and elderly people. The third definition claims accessibility is only for disabled people.

Only the first definition comes close to Tim Berners Lee's Vision of the World Wide Web. Additionally this definition includes other IS and T technologies such as any IS and T product, service or environment. Therefore the author will take this definition as a basis for the following contents.

3.2 Implementation

To realise that a product or service is usable by people with the widest range of capabilities developers has to comply with certain guidelines that specify accessibility standards. These guidelines define e.g. how to design the graphical user interface (GUI), how to write proper source code or how to define interfaces for assistive technologies such as screen readers. Unfortunately, there are plenty of different guidelines available, which vary by nations and in some countries, e.g. Germany, even by federal states. As a consequence products and services are generated under heterogeneous IT-Accessibility standards, causing usability and incompatibility issues for e.g. people with disabilities. To counteract such issues the World Wide Web Consortium (W3C) composed an international guideline for the development of Websites, the Web Content Accessibility Guidelines (WCAG). The content of this guideline can also be applied on other non-web-based IS and T technologies. The current Version of this guideline refers to 2.0 and was certified as an international standard by the International Organization for Standardization in 2012 (ISO, 2012). The main structure of WCAG 2.0 is divided into the principles perceptibility, operability, understandability and robustness (W3C, 2008). Figure 1 briefly explains the goal of each principle (W3C, 2008).

Even though the principles of WCAG 2.0 focus certain disabilities, the methodologies and techniques presented in the WCAG 2.0 accommodate older users' requirements as well (Arch, 2008). Therefore the WCAG 2.0 is a powerful tool to develop IS & T for elderly and disabled people.

For more detailed information on the principles of WCAG 2.0 the authors refer to the extensive guideline of the W3C, which can be found at http://www.w3.org/TR/WCAG20/.

3.3 Market Acceptance

Section 3.2 illustrated that an international standard with detailed information and guidelines on the technical implementation of accessibility for IS & T exists. However, IT-Accessibility in private and public

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