

# **Electronic Business**

Herausgegeben von Christine Strauss

**Band 3**

Marie-Luise Leitner

## **Business Impacts of Web Accessibility**

A Holistic Approach

**PETER LANG** Internationaler Verlag der Wissenschaften

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Marie-Luise Leitner

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A Holistic Approach



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# 1 Introduction

*“The power of the web is in its universality.  
Access by everyone regardless of disability is an essential aspect.”*

Tim Berners-Lee, Founder of the WWW, Director of the W3C

Information technology captures a vital part in the life of many people as an increasing number of people are joining the digital highway. Moreover, information and communication technologies (ICT) may improve personal autonomy and quality of life (e.g., Council of the European Union 2008). Worldwide, almost every 5<sup>th</sup> person has Internet access. In the European Union, the Internet penetration rate was even 48.1% in 2008 (World Internet Usage Statistics 2008).

Although the World Wide Web has become an indispensable source of information and services, the universal accessibility of the Internet, that Tim Berners-Lee originally envisioned, has not been realized yet. People with motor, cognitive, visual, or auditory impairments cannot use the Internet without the help of assistive devices, such as screen readers or Braille displays, that require accessible web sites (Sierkowski 2002). The Internet – originally based on the idea of offering equal opportunities to each and everybody – has emerged as a medium for the creation of digital divide as it excludes certain groups of people by not providing adequate accessibility.

## 1.1 Objectives and research contribution

In the area of computer science, web accessibility has become an established research field. Recent technical studies on web accessibility evaluation (e.g., Williams and Rattray 2003; Loiacono and McCoy 2004; Hackett and Parmanto 2005; Snaprud and Sawicka 2007), the development of evaluation tools and methods (e.g., O’Grady and Harrison 2003; Kelly et al. 2005; Brajnik 2006; Krüger 2008), and human computer interaction (HCI) and usability (e.g., Petrie et al. 2006) account for the importance of web accessibility in the area of computer science. Moreover, in recent years, research on accessible tourism (e.g., Pühretmair 2004) and accessible mobile use (e.g., Vigo et al. 2008) has been conducted.

Apart from the area of computer science, web accessibility plays a role in various scientific disciplines (cf. Figure 1). Legal regulations on European (cf. i2010 Initiative, Mandate 376) and national level (e.g., Austrian e-Government Act) have considered accessible design of web sites. In the field of education and pedagogy, there are attempts to develop curricula for web accessibility in higher education (e.g., Ortner and Miesenberger 2005; Matausch et al. 2006) as well as to create accessible learning environments for students (e.g., Johnson and Ruppert 2002).

Sociological research covers browsing behavior of people with impairments and the development of easy-to-read texts (e.g., Petz and Tronbacke 2008). Web accessibility plays a role in engineering when it comes to construction and design of assistive devices and smart environments. Finally, in the area of ethics, web accessibility takes over a major part, dealing with social responsibility, e-inclusion and human rights issues (Europe's Information Society 2008).

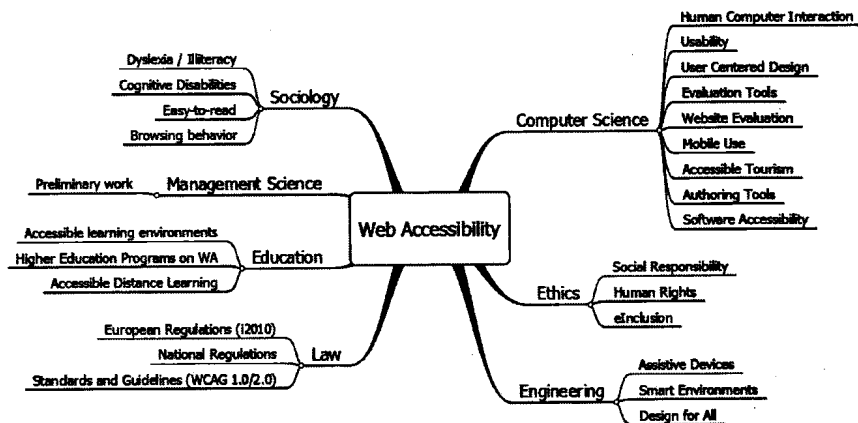


Figure 1: Web accessibility - the big picture

By contrast, the issue of web accessibility has gained little attention in the area of economics, business or management science so far, even though its implementation especially in organizations of the private sector justifies also business and management research to be considered. Previous research about web accessibility in management science focused on theoretical models for benefit analysis (Puhl 2008) and cost-benefit scenarios (Heerdt and Strauss 2004). These synthetic approaches included cost-benefit estimations but were not based on empirical data. Furthermore, the experiences of organizations with web accessibility implementation have not been examined so far. This contribution draws on a holistic approach to fill this research gap and analyzes the impact of web accessibility implementation by means of exploratory case study research and therefore constitutes a first holistic management science approach on web accessibility. This work considers an interdisciplinary set of literature derived from management, marketing, information science, organizational theory, and psychology that explains the emerging phenomena in the course of web accessibility implementation in an organization in the private sector. The diversity in theories enables a ubiquitous understanding of the enduring effects of web accessibility implementation.

Legal obligations and the implications of social responsibility may intensify the pressure on organizations to make their web sites accessible. Nevertheless, man-

agers will still require facts and figures about web accessibility costs, benefits, savings or expenditures, as well as amortization and financial plans, for their decision making process. Social pressure on its own is unlikely to suffice in convincing organizations of the benefits of implementing web accessibility. Decisions on new information and communication technologies are usually taken by the Chief Information Officer (CIO) of an organization. However, the support of the Chief Executive Officer (CEO) is crucial and requires efficiency considerations or benchmarks. In case of web accessibility implementation, these measures have not been developed so far which is the reason why they are tackled in this contribution' approach.

The first part of this contribution introduces a web accessibility implementation process (WAIP) model and identifies business impacts of web accessibility implementation by means of exploratory case study research in three major industry sectors. This part constitutes a first managerial approach to identify the experiences of organizations with web accessibility and generates a sound basis for management decision recommendations.

Due to the fact that the accessibility of web presences is not visible by a layperson, its business impacts can only be fully exploited when appropriate measures for quality assurance are given. A quality mark for accessible web presences constitutes a means to foster visibility and awareness to the general public and may therefore be the only impartial possibility for organizations to communicate their accessibility efforts. This communication represents the basis for further exploitation of business benefits.

A recent study on the availability of barrier-free media content in Austria resulted in 23 out of 50 organizations stating that their web site was accessible (Karmasin.Motivforschung 2006). This rather positive self assessment must be called into question, as no recognized certificate or quality mark currently exists for accessible web sites in Austria; the absence of such a certification implies that an impartial assessment is not possible for the time being. Moreover, research on the use of accessibility logos in e-business and financial web sites has shown that web sites make exaggerated claims of their level of accessibility (Petrie 2005).

In recent years, web accessibility quality marks have been developed and implemented on a national basis in several European countries. Despite the fact that these quality marks are all based on the Web Content Accessibility Guidelines 1.0 (W3C 1999) published by the World Wide Web Consortium, different evaluation procedures, implementations and levels of conformity have led to considerable heterogeneity within the European context. The European Commission has attempted to create a unified web accessibility quality mark in order to avoid further fragmentation. However, the development of a distinct European framework

for a web accessibility quality mark has been hampered by the diverging interests of the various stakeholders and by the extensive harmonization process involving the existing quality marks.

The second part of this contribution explores viable alternatives for implementing the European web accessibility quality mark in Austria. This contribution applies a look-ahead approach that assumes the release of a normative document and an evaluation methodology in the near future. A scenario analysis includes the development of four alternatives and their evaluation in terms of six criteria. Moreover, a business model for the development and implementation of an Austrian web accessibility quality mark is introduced.

Having specified the main objectives of the two studies presented in this contribution, two central research questions (RQ) can be derived:

*RQ 1) What business impact can be obtained from an implementation of accessible web presences in private sector organizations?*

*RQ 2) How does a business model for an Austrian web accessibility quality mark have to be configured in order to be applied in a European context?*

The two research questions relate to the two research gaps that are covered in this work. Table 1 depicts the research gaps and the corresponding research contributions and indicates the section in which these contributions can be found.

Research gap	Contribution	Section
1. Lack of examination of business perspective of web accessibility implementation	1a. Identification of business experiences of profit-oriented organizations with web accessibility implementation in the financial services, information, and tourism sector. Four main aspects have been identified: <ul style="list-style-type: none"> <li>i. reasons for implementation</li> <li>ii. changes after implementation</li> <li>iii. incentives for implementation</li> <li>iv. reasons for failure of implementation</li> </ul>	4
	1b. Identification of similarities and differences across sectors.	5
	1c. Development of a web accessibility implementation process (WAIP) model for organizations based on case study research data.	5
2. Lack of business model for an Austrian web accessibility quality mark	2a. Development and evaluation of four implementation alternatives for a web accessibility quality mark by means of scenario analysis.	6
	2b. Development of a business model for an Austrian web accessibility quality mark that complies with European structures.	6

Table 1: Research gaps and corresponding research contributions

Due to the fact that this work looks at the issue of web accessibility from two different perspectives, it can be referred to as a **holistic business analysis of web accessibility**. This holistic approach includes two independent studies that have a strong relationship between each other.

1. Determination of business impacts of web accessibility implementation for organizations:

An exploratory case study analysis in three business sectors identifies the business impacts of web accessibility implementation for private organizations and develops a web accessibility implementation process model.

2. Development of a business model for an Austrian web accessibility quality mark:

Viable implementation alternatives for a web accessibility quality mark are analyzed by means of scenario technique. Business model specifications for a quality mark that fits into a European framework are developed.

These two perspectives are closely interrelated. In the course of this research, the connection of both perspectives has become increasingly obvious. Organizations



need a quality mark in order to communicate and promote their accessibility efforts to the public. Moreover, the quality assurance dimension and credibility is fostered by a quality mark. On the other hand, the success of a web accessibility quality mark is reliant on organizations willing to consider accessibility for their web presences. Thus, a dependency between these two studies has been identified that justifies the holistic approach in this work.

### 1.2 Research design

Figure 2 depicts the possible perspectives that can be considered when analyzing web accessibility from a business angle. As already stated before, two perspectives are covered in this work: (i) organization and (ii) authority. The customer perspective represents a third possibility that is added for reasons of completeness but is out of scope of this contribution.

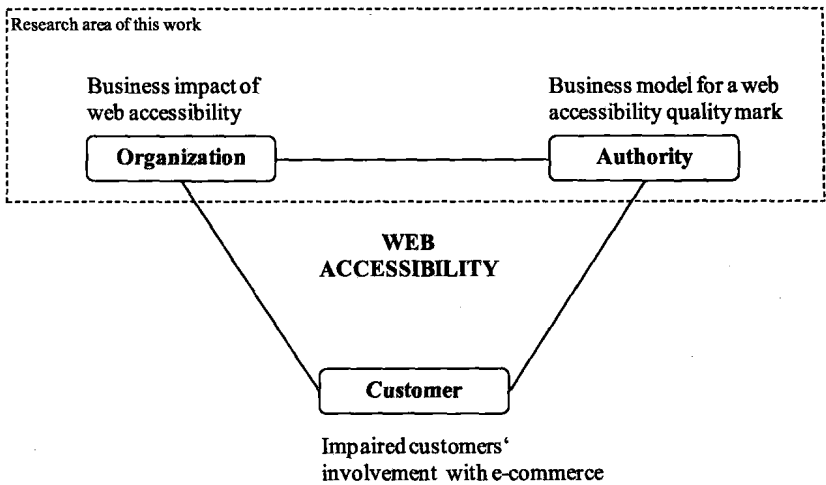


Figure 2: Research design

These three perspectives represent elements that are assembled to a new holistic web accessibility business approach.

From an organizational perspective, the business and economic impacts of web accessibility implementation take over a central criterion in the decision making process. Therefore, this section covers the determination and realization of case studies on the business and economic impacts of web accessibility implementation into an organization. These case studies are intended to show if web accessibility implementation entails business opportunities and benefits for organizations in the b2c sector. Moreover, the experiences and problems organizations face