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Maria Erdey-Gruz

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1. INTRODUCTION

1.1. Motivation

Information technology captures a vital role in the life of the ever increasing number of people who have joined the digital highway. The globally available mass of information and services offered on the Internet creates the illusion that the Internet offers equal opportunities to each and everybody. However, at a closer look it can be seen that the Internet has emerged as a medium that creates a digital divide, as it excludes certain groups of people by not providing adequate accessibility.

Tourism, as one of the major economic industries, has close ties with Information Technology, particularly with the Internet. There is a notion to make tourism accessible for all, but so far it does not include the web accessibility of tourism related websites.

1.2. Purpose of the study

The main research question of this diploma thesis can be formulated as follows:

What are the business impacts of web accessibility in the hotel sector in Austria?

In order to answer this question following sub-questions need to be considered:

- What is the current status of web accessibility and accessible tourism in Austria?
- What is the intensity of web page usage in the hotel sector?
- How accessible are the web pages in the hotel sector in Austria?
- What are the economic impacts of accessible web pages?

The objectives of this study are:

- To provide a state of the art analysis of web accessibility in the tourism industry;
- To give an overview of the current situation of web accessibility with the focus on the hotel sector in Austria;
- To estimate the business impacts of web accessibility in the hotel sector. This objective is reached by a quantitative study regarding web accessibility of Austrian hotel web pages and in-depth interviews with hotel managers.

In chapter 2, a short overview on web accessibility, on its standards and regulations, user groups, and economic and social benefits is given. General questions on accessible tourism in the hotel sector in connection with Information Technology are discussed in chapter 3; furthermore, a hotel categorization model on accessibility is introduced. In chapter 4, the results of a case study research will be introduced, including a study on web accessibility of Austrian hotel web pages, and several in-depth interviews and their interpretation.

2. WEB ACCESSIBILITY

While on paper the problem of accessibility for disabled is complicated to resolve in one integrated document, on the internet technologically it is not difficult to create web pages accessible for all. The first web pages have been created in the early nineties (W3C) and shortly after, the notion of web accessibility has been introduced. Generally, web accessibility "*means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web"* (W3C 2005b). In order to comply with these criteria, guidelines have been developed to ensure that everybody can author a web page so that it is accessible. The first general guidelines (Web Content Accessibility Guidelines 1.0, WCAG .10) in this area have been developed by the World Wide Web Consortium (W3C) in 1999 (W3C 2008d) within the Web Accessible Initiative (WAI).

2.1. Standards and regulations

2.1.1. Technical aspects

In the last decade several guidelines, standards and regulations have been developed in order to foster web accessibility worldwide. The W3C has been one of the pioneers in this endeavor.

The WAI defined three major guidelines for accessible web pages (W3C 2008a).

1. *Web Content Accessibility Guidelines (WCAG):* these are the most common and citied guidelines, which deal with the information on a web site (text, images, forms, sounds). The WCAG 1.0 was published in 1999 and is since then widely used to assess the accessibility of web pages. The WCAG 1.0 consists of 14 guidelines that are general principles of accessible design (W3C 2008d). Each guideline has one or more checkpoints that explain how the guideline applies in a specific area. The checkpoints are assigned in three priority groups, based on the necessity for accessibility. The first priority incorporates the "must-criteria", which have to be met to ensure the basic access of information for people with disabilities. The second priority summarizes those guidelines that should be met in order to remove significant barriers of web accessibility. The third priority contains guidelines that

might be addressed in order to provide further accessibility. Table 1 shows the key concepts of accessible web design that should be considered.

Images & animations	Use the alt attribute to describe the function of each visual.
Image maps	Use the client-side map and text for hotspots.
Multimedia	Provide captioning and transcripts of audio, and descriptions of video.
Hypertext links	Use text that makes sense when read out of context. For example, avoid "click here".
Page organization	Use headings, lists, and consistent structure. Use CSS for layout and style where possible.
Graphs & charts	Summarize or use the "longdesc" attribute.
Scripts, applets, & plug-ins	Provide alternative content in case active features are inaccessible or unsupported.
Frames	Use the "noframes" element and meaningful titles.
Tables	Make line-by-line reading sensible. Summarize.
Check your work	Validate. Use tools, checklist, and guidelines at http://www.w3.org/TR/WCAG

1. Table: Key concepts of accessible web design (W3C 2008e)

The W3C is currently working on WCAG 2.0, which will respond to many changes and developments of both web technologies and assistive technologies that have occurred since the publication of the first version. Part of it will be the Accessible Rich Internet Application Suite (WAI ARIA) that enables web developers to create accessible dynamic web content and web applications. Rich Internet solutions (e.g.: Net banking, web-based ERP applications) are increasingly used by web designers to create sophisticated web pages.

2. *Authoring Tool Accessibility Guidelines (ATAG):* Authoring tools are services and software that create web sites and web content, such as HTML and XHTML editors, Content Management Systems, blogs, wikis, photo sharing and social network sites. One of the characteristics of these solutions are the user defined content. As these tools have become increasingly important with Web 2.0, it is crucial that their accessibility is ensured.

3. *User Agent Accessibility Guidelines (UAAG):* These guidelines summarize recommendations for user agents and Application Program Interfaces, such as web browsers, media players, and assistive technology solutions, in order to lower barriers to web accessibility.

Following the guidelines of WAI shall ensure an accessible web page, even if such a page can hardly ever be simultaneously barrier-free for all groups of the disabled. The inexperienced user only notices that a web page is not accessible when facing a barrier, otherwise, at first sight, accessibility is not detectable. Therefore, it is particularly difficult to raise awareness of the issue. Currently, there is no widespread quality benchmark (e.g. accessibility certification) that allows a website owner to promote accessibility. The WCAG logo of W3C is based on self assessment and thus may lead to misuse (Petrie et al 2005).

Besides the web page being accessible, other components, notably client-side applications have to be accessible in order to enable accessible web surfing. Figure 1 shows these components and other guidelines identified by WAI that affect web accessibility, particularly the assistive technologies, users' knowledge and experience, developers, authoring tools and evaluation tools.

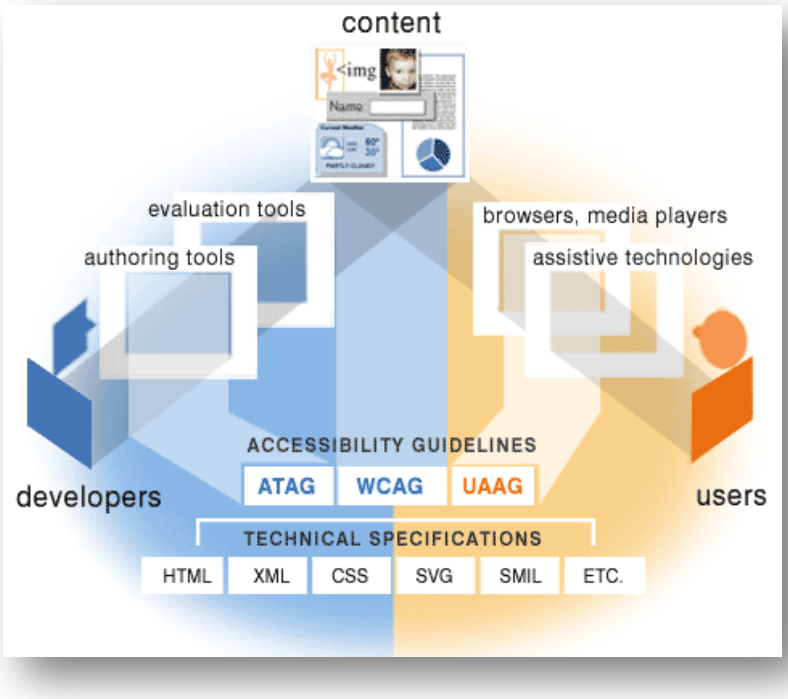

Figure 1: Components of Web Accessibility (W3C 2008f)

The interdependence of these tools will define the scope of web accessibility, the weakest link will most probably define the level of accessibility in the whole process. For instance, if the web page is not accessible, its content will be still inaccessible for people with disabilities even if they use assistive technology and the browser is also supporting it.

2.1.2. Usability

A great benefit of accessibility is that everybody can profit of an accessible design of a web page because accessible pages are standard-compliant and therefore represent high quality. Usability has a similar notion, whereas its main goal is for users to be able to learn and use a product to achieve their goals the quickest way, and provide them with satisfaction. Usability refers to *"the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of user"* (DIN EN ISO 9241-11). Therefore, web accessibility and usability are complementing one another, web design should take both aspects into consideration.

A web site designed along the usability standards allows the end users to easily, effectively and efficiently use the web page for the purpose it was designed. The DIN EN ISO 9241-151:2008 standard on Ergonomics of Human-System Interaction (HCI), Guidance on World Wide Web user interfaces defines three basic criteria on which the usability of a software system is measured: effectiveness, efficiency and satisfaction (DIN EN ISO 9241-151:2008). Since the implementation of this standard, additional factors have been identified to promote usability, such as empowerment, enjoyment, experience, enchantment, care and socialization (Thimbleby 2008). There are well known benefits for usability (USP 2008), such as:

- Increased productivity;
- Decreased training and support costs;
- Increased sales and revenues;
- Reduced development time and costs;
- Reduced maintenance costs;
- Increased customer satisfaction.

Usability is a user friendly, user centered design, and aims to provide the best possible solution in using Information Technology. It does not necessarily imply that solutions of usability are accessible. Moreover, some of theses solutions are extensively inaccessible, like using JavaScript for drop down menus, or the contrasts of some color combinations (Morsbach 2004). Most of the times during user testing only "normal users" are considered, and therefore the aspects of accessibility are not taken into account. On the other hand, accessibility does not imply that it is user friendly; it only enables people with disability to access web pages. The usability of the web page also has to be considered.

2.1.3. Legal aspects

The importance of the issue of web accessibility has been recognized by legislative bodies on both national and international level. Therefore, in the last decade several legal regulations have been passed on international, EU and national level.

On the international level, the most important regulations are as follows:

- *Rights of People with Disabilities*, an International Treaty signed at the UN Convention in August 2006, which is mandatory, binding and with coercive potentiality. It guarantees the rights and freedoms of people with disabilities, including the raise of awareness from the earliest ages and providing resources to the maximum available. (UN Convention 2006)

The European Union has a series of regulations, directives and initiations for protecting the rights of people with disabilities, the most important are the following:

- *European Convention on Human Rights and Freedom:* sets for protection a number of basic rights and freedoms and established the European Court of Human rights. (ECHR 1950)
- *European Charter of Fundamental Rights*: it includes the fundamental rights and freedoms recognized by the European Convention on Human Rights, including the right of everyone to equality before the law and the protection against discrimination. Its legally binding status is pending on the ratification of the European Treaty of Nice. (ECFR 2000)
- *European Agreement for the Protection of Human Rights and Fundamental Freedom*: the European Union Treaty of Amsterdam provides both in its preamble and in a specific chapter the protection of Human Rights and Fundamental freedom. The

Treaty is legally binding for all European Union member states. (Treaty of Amsterdam 1997)

- *eInclusion/i2010 initiative*: the eInclusion project ended in 2007 and meant to open a dialog among specialists working on accessible Information Society and creating a "knowledge base" for subsequent creation of policies and practice. The results are various reports and practices suggested and implemented (eInclusion). The i2010 is the EU policy framework for the information society and media, with one of the focuses on eIclusion and eAccessibility. (i2010)

The international regulations sooner or later, directly or indirectly, do effect the national legislations of the most European Union member states. In Austria the rights of people with disabilities are regulated in a number of bills:

- *Austrian Federal Constitution*: Article 7 of the constitution states that "*the Republic commits itself to ensuring the equal treatment of disabled and non-disabled persons in all spheres of every-day life*". Article 8 recognizes the Austrian sign language as an independent language. (B-VG 1920)
- *Austrian Equalization Act for People with Disabilities*: indicates that people with impairments must be granted equal rights for participating in public life. (BGStG 1979)
- *Austrian E-Goverment Act of 2004*: states that the public websites have to meet international standards on web accessibility by January 2008. However, it is not specified what sphere is affected. In the narrow sense only governmental web pages would be included, but in the boarder sense all organizations that receive state subsidies (Krispl 2004). (E-GovG 2004)

Although the WCAG 1.0 is a guideline, the EU considers it as de facto standard, and it is taken as reference by existing international laws (Ambrose 2007).

2.2. User groups

2.2.1. People with disabilities

The biggest beneficiary group of the accessible web is people with disabilities. The definition of the United Nations World Health Organization is widely accepted as etalon (Leonardi et al 2006): "*Persons with disabilities include those who have long-term*

physical, mental, intellectual, or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others." (WHO ICF 2006) The WHO is constantly reworking the definition, as there are concerns regarding this wording. Many countries use different classifications, which makes difficult to compare the numbers of people with disabilities internationally. A cardinal concern is the question of the classification of short term impairments (Buhalis et al 2005).

It can be estimated, that in the EU at least 50 million people, which is 10% of the population, have some type of disability (Burnett & Baker 2001, EDF 2008). People with impairments may be more dependent on using the Internet as the main source of information, since other sources, like printed information or personal advice, may be difficult or even impossible to access. It is difficult to assess the ratio of people with disabilities surfing the Internet[1] (Vos & Ambrose 2007).

Many people with disabilities would suffer significant limitations if they were not using assistive technologies. Some people might be able to use the Web, like any user, only it would take more time and some information might get lost in the process. The industry has reacted to the growing demand of people with disabilities and is creating various helping tools, so-called assistive technologies, to facilitate web usage. Therefore, the question can be raised: why should web developers be concerned with accessible web pages if people with disabilities have assistive technologies for using the Web? Assistive technologies rely on standardized norms and technologies: therefore it is presumed that the web pages comply with basic standards, such as HTML (W3C 1999)/XHTML W3C 2001), CSS (W3C 2007) or WCAG (W3C 2008d) (cf. section 2.3). Accordingly, only web pages that comply with these specifications will be able to fulfill the criteria for using assistive technologies.

In the context of web accessibility the W3C uses a broad definition on disability that includes everybody who might face barriers while using the Internet. The definition refers to six kinds of impairments (W3C 2005a).

- *Visual disabilities:* this group includes people suffering from blindness, low vision or color blindness. Blind people use various assistive technologies to access information on web pages. The technology most widely used is screen reader software, which

[1] Currently, there are no comprehensive statistics on the Internet penetration rates of the disabled.

transfers text into speech. The information is then transferred to a speech synthesizer or to a refreshable Braille display. Also text-based browsers (e.g. Lynx) and voice browsers are often used to replace the graphical user interface browsers, such as Internet Explorer or Firefox. Besides, blind users cannot use the mouse and have to navigate with keyboard through the web page content. People with low vision also rely on additional assistive technologies for easier reading, such as screen magnifiers or add-ons that enable them to increase the text size or apply a user defined font size. Color blind people have difficulties distinguishing between two colors, such as red and green or yellow and blue. User defined style sheets or well-established color-contrasts facilitate web usage for people with color blindness.

- *Hearing impairments*: this group includes people who are hard of hearing or deaf. Deaf people use sign language, their native language, to communicate. They consider the written and oral representation of the language as a foreign language and therefore might have problems with complex sentences. People with hearing impairments use amplification of audio or captions in order to understand audio content.
- *Physical and motor disabilities:* People with physical and motor disabilities have limited muscle control or sensation, suffer from joint problems or have missing limbs. In these cases the mouse can be replaced by alternative pointing devices or a mouse that can be controlled with head, mouth, voice or eye-gaze. Special keyboards with personalized layout and limited keys can also be used.
- *Speech disabilities:* people with speech disabilities use alternative input solutions instead of the speech such as text-to-speech software.
- *Cognitive and neurological disabilities:* this group consists of various disabilities where the cognitive abilities are affected, such as dyslexia and dyscalculia, attention deficit disorder, intellectual disabilities, memory impairments, mental health disabilities and seizure disorders. Different solutions may improve cognitivity, such as turning off multimedia elements like flashing pictures, sound, or providing information through several modalities.
- *Multiple disabilities*: People with multiple disorders might suffer from more than one disability and therefore will require unique, personalized solutions in order to use the Web.

Studies show that currently only a fraction of web pages meet the above mentioned basic requirements (Pühretmair 2004, Williams & Grimes 2007, Williams et al 2004), but some

people with disabilities are still surfing the Internet, though only in low numbers. There is a high demand for more accessible websites, but web designers seem to neglect people with disabilities. They claim that the creation of accessible web sites increases the production cost and time. Additionally, they allege the designs being less eye-catching.

2.2.2. Older users

Accessible web is also of high value for elderly people, a user group that is becoming increasingly important from an economic point of view. Although it is difficult to define who should be considered as an older user (it varies between the ages of 50 to 65 years), most countries define it alongside the retirement age. As in the USA, and many countries in Europe the retirement age is at the age of 65 years, many studies consider members of the elderly user group to be older than 65 (W3C 2008b). The world population, particularly in developed countries, is aging rapidly. Currently, around 17% of the EU-27 is older than 65 years, and it is estimated that by 2020 it will increase to 25% of the EU population (eInclusion). Similar demographic trends can be detected in other developed countries worldwide.

Although elderly people are not automatically considered to be people with disabilities, there are many age-related conditions, such as vision impairments, hearing loss, motor skill diminishment, memory and processing problems that are similar to those experienced by the disabled. Moreover, elderly people in the aging process tend to have a combination of multiple sensory losses and functional impairments (W3C 2008b). Since they are not yet used to the rapid information flow and the overwhelming amount of information, older people often have problems grasping and handling web pages. Therefore, it is apparent that the accessibility requirements of web pages concerning people with disabilities will also meet the requirements of elderly people in many cases.

Currently, only 10% of people older than 65 years use the Internet (eInclusion). Fox 2004 showed that the elderly in the USA use the internet for diverse purposes like product research, shopping, making travel reservations, visiting government web sites, looking up religious and spiritual information and doing online banking (Fox 2004). In the near future, the ratio of internet usage of elderly will increase dramatically, due to two developments:

- The Internet penetration in this age group is constantly increasing, just like in other age groups. This means, that more and more elderly people are joining the digital highway and facing barriers because of their shortcomings. Easy-to-understand and easy-to-use web pages will gain in importance significantly.
- A more internet-accustomed generation will age in the years to come. They will have a good command of using the Web, but slowly be facing barriers due to their age-related conditions listed above.

Based on the current trends of web accessibility it looks like web designers are yet to recognize this important group that dispose of a high discretional buying power.

2.2.3. Mobile users

Another user group that benefits significantly from web accessibility is the group of the mobile device users. The internet usage for mobile devices is rapidly expanding, in the next 5 years it is expected to triple its size to 125 Million European users, which represent 38% of all mobile users (Forrester Research 2008). In the age of smart phones and Personal Digital Assistants (PDA), these users face similar barriers to people with disabilities (e.g. they rarely use the mouse, they often do not or cannot load images) (W3C 2008c). The W3C recently established a new workgroup, the Mobile Web Initiative, to explore and support mobile based Internet usage. Part of their work is to explore similarities between the Web Content Accessibility Guidelines and Mobile Web Best Practices, the recommendation developed for web pages accessed from a mobile device. Based on the current findings, there appear to be many similarities in the two requirements. As mobile device users represent a significant economic importance, it is anticipated that delivering sophisticated web content to mobile devices will have a high priority in companies' web policies.

Unlike in the first two user groups mobile providers and producers are continuously developing applications to meet the demands of mobile users, partly because many business people are using mobile internet, which is clearly an important economic group for the private sector.

2.3. Benefits of web accessibility

2.3.1. Economic benefits

Although rarely acknowledged, web accessibility represents a significant economic advantage in several areas: in the potential realization of so far untapped purchasing power — be it people with disabilities, elderly users, mobile users or people with educational constraints.

An often neglected benefit of accessible web pages is that they tend to achieve higher rankings in search results. A search engine is similar to a blind user, as it considers only the code, just like the screen reader reads it out loud for a blind user (Google Labs 2008). A well structured code will receive a higher value from a web-crawler and will be ranked higher within the listed search results. Therefore, companies focusing on search engine marketing will eventually redesign their web pages with respect to requirements of standards and norms and therefore with respect to accessibility requirements. While in 2005 the European search engine marketing generated approximately 1.4 billion Euros of spending, it is estimated that by 2010 this amount will reach 3 billion Euros (Omwando 2005).

The creation of an accessible web site might emerge as a more expensive project compared to a non-accessible web page. However, after its implementation the cost effective maintenance, the reduced server load and the decreased complexity will make up for the initial costs and prove that an accessible webpage can in the long run be economically an advantageous solution. A rough-cut cost-benefit analysis taking into account the total accessibility costs depending on the enterprise size and the complexity of the website on the one hand and the audience increase on the other hand resulted in estimated relative savings for accessible websites between 12% and 35% of the website costs (Heerdt & Strauss 2004).

2.3.2. Social benefits

Corporate social responsibility (CSR) "*is a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis*" (COM/2006/0136). An increasing number of enterprises have their own CSR policies and action plans, which shows the increasing importance of social responsibility. Studies show that a comprehensive CSR plan results

in a better overall financial performance of an organization (Moir 2001, Key & Popkin 1998, Waddock & Graves 1997).

Having an accessible web site shows the social responsibility of an organization with regard to avoiding discrimination towards people with disabilities. This philosophy can be part of an implicit behavior from the manager side or be an explicit part of the organization's business concept. The long term economical benefits are already acknowledged. (Moir 2001, Key & Popkin 1998, Waddock & Graves 1997).

3. ACCESSIBILITY IN TOURISM

3.1. Tourism overview

The World Tourism Organization defines tourists as people who "*travel to and stay in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited*" (OECD 2008). Tourism is considered as a cross-sector industry that affects communication, transport, construction, training, human rights, etc. (Ambrose 2007). Figure 2 illustrates the tourism service chain, starting with information on destination, accommodation, transport and offers on services.

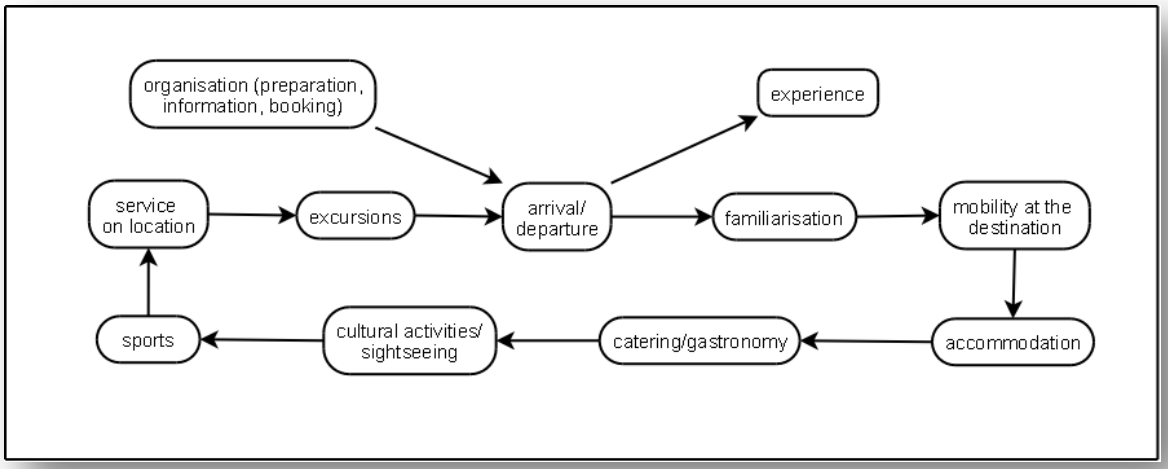

Figure 2: Tourism service chain (based on NATKO 2002)

Tourism has a significant importance in the economy and is becoming the fastest growing economic sector in the world. According to the World Travel and Tourism Council the total tourism related economy has been estimated to produce as much as 11% of GDP and to employ 8% of the labor force worldwide, hence the travel and tourism sector has been recognized as the largest civilian industry in the world (ILO 2001). In the last 50 years the tourism arrival expanded 6.5% annually, while the tourism income showed an average 11.5% annual increase. The business volume of tourism competes with the oil exports or automobile export volume (UNWTO 2008). It is expected that the tourism volume will continue to increase in coming years.

Accommodation is one of the core businesses in tourism. Anybody who is planning to stay somewhere overnight needs accommodation. There are many classifications of the accommodation sector, and the distinctions are not always clear, since the lodging owners can often classify their properties at their own discretion. However, some general definitions exist. A hotel is defined as "*an establishment whose primary business is to provide lodging facilities for the general public, and which furnishes one or more of the following facilities: food and beverage service, room attendant service, concierge, bell and door attendant service, laundry or dry cleaning, and use of furniture and fixtures"* (Kasavana & Brooks 1998). The hotel size usually ranges from 50 to 2000 or more rooms.

Tourism plays an important role in Austria's economy. Austria is the 9th most important tourist destination worldwide with over 20 million arrivals per year. In 2007, the tourist sector directly accounted for 8.7% of the GDP, generating an income of 23 Million Euros (Statistik Austria 2008b). But calculating the leisure consumption of residents in usual environment and tourism consumption in non-usual environment, the contribution of the tourism and leisure sector to GDP accounted for 16.5% in 2005, which represents approximately 40 Million Euros (Statistik Austria 2008c). In 2007, a total of 121.42 million overnight stays were reported, from which 65% were covered by the hotel sector (FMEL 2007).

3.2. The hotel sector in the age of the Information Technology

In travel-tourism industry, information is essential for the customer because without information, the individual's motivation and ability to travel is highly limited (O'Connor & Frew 2004). Gathering information is the first step in the tourism service chain (cf. figure 2), if facing difficulties at the first phase, the subsequent steps might never occur.

For the hotels, their web presences constitute the main communication platform with their current and potential customers. Since the purchase and consumption of mostly invisible goods are often separated in time, tourism is particularly suited to Information Technology (Wynne et al 2001). In the hotel sector, effective distribution of the rooms is vital for the hotel. Hotel rooms are a perishable commodity and sold in a market characterized by high capital costs, increasing competition and shrinking margins

(O'Connor & Frew 2004). For a hotel, the most costly room is the unsold hotel room. Theoretically, a room sold for even one Euro over its variable costs would be better than an unsold room, because it contributes to the overall fix costs of the hotel. Any additional platform that allows selling a room even in the last minute is vital. Therefore, the hotel sector was also among the early adopters of the Internet technology (Williams & Grimes 2007).

In the hotel sector, electronic distribution channels are increasingly gaining in importance (O'Connor & Frew 2004). 89% of the companies in the accommodation sector with 10 or more persons employed own a web page and 39% of them receive booking through the Internet. However, they are still behind the economic average in relation to the integrated e-business solutions implemented (Knauth 2006). This contradiction implies that although many hotels dispose of their own web pages, they are not connected with sophisticated integrated information systems or advanced Content Management Systems.

Statistics show that travelers increasingly seek information online, both for planning and booking their trips. According to Harvest Digital, the Internet is the top information source used by European outbound travelers (OECD 2008). In Europe, over one hundred million Internet users have visited travel related websites in March 2006, which constitutes for over half of the European Internet users. In another study, Marcussen estimates the European online travel market for 2007 to be 49.4 billion Euros, 17% of which was spent in the hotel sector (Marcussen 2008).

This eight billion Euro market is divided into various online booking systems and bookings provided by the hotels' own web sites. A study by J.D. Power and Associates from 2007 showed that almost half of the hotel guests use online booking systems, which is a 34% increase since 2005. However, the hotel branded websites are increasing their share from general travel and booking sites, with only one in four guests choosing general booking web sites (JD Power and assoc. 2007). These data underline how crucial it is for a hotel to have a web site with relevant and actual information.

3.3. Accessible Tourism

The main concept behind accessible tourism is the idea that "everybody – regardless of whether they have any disabilities – should be able to travel to the country, within the country and to whatever place, attraction or event they should wish to visit" (Nordiska

Handikappolitiska Radet 2002). The target group for accessible tourism is similar to the one of web accessibility, though according to the World Health Organization the term "activity limitation" should be used instead of "disability" (WHO ICF). In this thesis the terms activity limitations, impairments and disabilities will be used as synonyms.

The accessible design and information provide benefits for many tourist groups, including families with young children, the elderly generation and generally every tourist. People with reduced mobility represent 40% of the population, including those 10% of people with disabilities (cf. chapter 2.2.1). Therefore, accessibility in tourism is essential for 10% of the population, necessary for 40% and convenient for 100% (Ambrose 2007, Neumann & Reuber 2004).

3.3.1. Accessible Tourism in Austria

In a fundamental study on the economic impact of accessible tourism in Germany by the Federal Ministry of Economics and Technology in 2004 an extensive survey was conducted among people with disabilities regarding Accessible Tourism. Relevant key findings of this study include (Neumann & Reuber 2004):

- 70% of the people with disabilities have the financial and physical condition to travel;
- Over 50% of the people with disabilities have been traveling in the past;
- 37% of people with disabilities have already renounced their travel due to inadequate conditions.
- Almost 50% of the people with activity limitations indicated they would travel more if the circumstances were more favorable.

There has not been any comprehensive study in estimating the size of the group of people with activity limitation visiting Austria. The "Accessibility Market and Stakeholder Analysis" study conducted by the project "One-Stop-Shop for Accessible Tourism in Europe" (OSSATE) estimated in 2005 the market size of disabled people including elderly in Austria to be 2.06 million people, which is approx. 25% of the Austrian population (Buhalis et al 2005).

A currently conducted research by Salzburg Research, "eAccessibility in Sports Regions", made an estimation of the market potential and market volume of Accessible Tourism in the province of Salzburg using available statistical data (Markus 2008). Using

the same logic table 1 shows the estimated numbers of people with activity limitations traveling in Austria.

	%	Arrivals to Austria (millions)	Overnight stays (millions)
Overall number of people traveling in Austria (domestic and international)	100	31,1	121,42
EU population with at least one impairment	15,7	4,88	19,06
Number of people with disabilities who have the physical and financial possibility to travel	70	3,42	13,34
Number of people with disabilities who have not renounced their travel	**63**	**2,15**	**8,41**

Table 2: Estimated number of people with activity limitations traveling in Austria

Based on the Eurostat statistics from 2003, 15.7% of the population between the age of 16 and 64 in EU-25 are suffering from at least one impairment (Eurostat 2003) (cf. table 1). Projecting this 15.7% to the 31.1 million arrivals and 121.42 million overnight stays in Austria in the calendar year 2007 (Statistik Austria 2008a) makes over 19 million overnight stays and almost 5 million arrivals annually by people with disabilities. Adjusting this number to all guests older than 65 years who most likely suffer from at least one impairment would significantly increase this number. However, the numbers are deliberately kept at underestimated levels. The 5 million arrivals in Austria include all potential travelers with disabilities, from this assumably 70% have the physical and financial condition to travel (Neumann & Reuber 2004). Another 37% had to renounce their travel plans due to inadequate accessibility conditions at their preferred travel destination (Neumann & Reuber 2004). These corrections mean 2.2 million arrivals and 8.4 million overnight stays could be realized by people with disabilities in Austria. This market size equals the arrivals of the State of Upper Austria in the calendar year 2007 whereas the number of overnight stays even exceeds Upper Austria's numbers by 25%.

However, based on the preliminary results of Salzburg Research, from those tourists with disabilities who could have traveled, only 11% traveled to the province of Salzburg in the 12 months before the research was conducted (Markus 2008). If we interpret this 11% to the Austrian nationwide numbers, this would mean that out of the possible 2,2 million

tourists with disabilities who could have travelled, merely 250 thousand actually traveled in the last 12 months in Austria. This highlights the huge gap between the realized and the potential market of Accessible Tourism in Austria.

Another interesting finding of Salzburg research is that currently only 25% of the lodgings offer some kind of accessible accommodations, which means that in order to utilize the whole potential of this market segment, significant accessibility investments have to take place first. (Markus 2008)

Another difficult aspect is to assess the purchasing power of the group of people with activity limitation. However, some estimates can be done: using the previous example, an estimated buying power can be calculated. The FMET study showed that the average daily spending of people with disabilities on holiday is 15% higher than the average travel spending of the general population (Neumann & Reuber 2004). Furthermore, disabled customers are willing to spend more for services that are suitable for them. In Upper Austria the total spending on vacation and business trips, visits to relatives and friends and stays in weekend houses/secondary residence was approximately 2.87 billion Euros in year 2006. Around one billion Euro was spent by those who stayed overnight in a commercial or private accommodation (UATA 2008). These numbers, even if only estimated, show that the similarly large group of people with disabilities can prove to have significant purchasing power.

The travel patterns of people with activity limitations are bound to be different from those without limitations due to the special requirements of facilitating their impairments. The next section will review some of the main patterns of tourists with disabilities in order to gain insight of their special needs.

3.3.2. Travel patterns of disabled tourists

The numbers presented in the previous section are based on the general tourist behavior of those visiting Austria. However, people with disabilities constitute a special tourist group with unique travel motivations and travel needs. In 2006, the OSSATE report (Buhalis et al 2005) reviewed previous research and studies on specific travel patterns of disabled tourists. It concluded that the motivations are similar to tourists without limitations, but resting and relaxation has a higher priority. Also holidays for health

improvement and the desire to experience nature are more important for travelers with activity limitations.

The OSSATE report has confirmed the presumption that disabled travelers use Internet as one of the main sources of information. In Accessible Tourism, a special emphasis is placed on the accessibility of information as it constitutes a prerequisite for traveling. Disabled people are forced to plan their trips much longer ahead and with more attention to detail. They use the Internet to gather information to a larger extent than other travelers (Ray & Ryder 2003). During a multiphase information gathering process disabled travelers gather information on the internet and brochures; they consult with disability organizations and local tourist information providers on accessibility conditions. At the last step they verify directly with the service provider to check the accuracy of the information (NOP Consumer 2003). These steps are necessary due to the fact that currently, most of the information on accessibility is inadequate and unreliable (Buhalis et al 2005, Neumann & Reuber 2004, Pühretmair 2004). Therefore, word of mouth recommendations are a vital part in choosing the destination. The information requirement on accessibility rises with increasing accessibility requirements: the more specific the requirements for facilitating the disabled customer are, the more detailed and precise information it would require. For example, a person who has multiple disabilities, like motor disabilities and hearing impairments, has to make sure the hotel is both wheelchair accessible and has special fire-alarm system for deaf people installed. However, currently the amount of information content on accessibility is reciprocal to the level of the accessibility requirement (Buhalis et al 2005), which causes a major travel barrier for people with multiple disabilities.

Since traveling for disabled people is more challenging for various reasons, many of them prefer not to travel. However, studies showed (Neumann & Reuber 2004) that for people with disabilities who do travel, the travel frequency is basically the same as that of the overall traveling population (Buhalis et al 2005). But studies also showed that people with impairments rarely travel on their own, since their often require assistance, partly due to insufficient accessibility conditions at the destination. The travel duration is not significantly different from the total population. However, people with disabilities prefer traveling in low season, when the travel destination is less crowded (Van Horn 2002). In addition, they are very faithful. If they find a place where their preferences are met, they

tend to return there (Neumann & Reuber 2004). In this case, the multiphase complicated planning process can be reduced to a simple booking.

The FNET study (Neumann & Reuber 2004) found that the travel spending of tourists with disabilities is 15% higher than the average travel spending of the general population. Furthermore, disabled customers are willing to spend more for services that are suitable for them.

All together it can be concluded that customers with disabilities provide numerous economical advantages for the hotels:

- People with disabilities represent a significant group of population, which can vary between 15-25% (Buhalis et al 2005). Therefore providing accessible accommodation will increase the number of guests.
- Currently 10-20% of disabled people are traveling. This means that there is a major growing potential in attracting these tourists.
- Tourists with disabilities represent important purchasing power.
- The travel patterns of disabled customers are partly identical to the general population, with some economically advantageous characteristics:
    - They often travel with family and friends, therefore they create a multiplication effect in their economic power;
    - They often travel in low seasons, therefore they could be important to ensure higher capacities in off seasons for the hotels;
    - They are faithful customers who tend to return if satisfied with the offered services;
    - The strong word of mouth propaganda in the disabled community means satisfied customers may attract new customers.

Unfortunately, tourism stakeholders tend to ignore customers with disabilities and do not recognize their market potential. There is a clear demand from the customer side for accessible tourism, which has been met only rarely by the service providers so far. Additionally, special attention has to be placed on adequately informing customers with disabilities.

3.4. Accessible hotel web pages

As stressed before, information on accessibility is a key component for travelers with a disability. Previous studies summarized by the OSSATE (Buhalis et al 2005) project concluded that the following requirements are important in respect to information on accessibility:

- Information has to be channeled through or supervised by adequate disability organizations in order to be reliable. This ensures trustworthiness and usefulness of the provided information.
- The provided information on accessibility has to be integrated in the general information stream (i.e.: the information should be on the same site than all other general information and not on a separate dedicated site). This ensures that people with disabilities are not discriminated against and keeps the operating cost low as no separate information channel has to be maintained.
- In order to underline the reliability of the provided information on accessibility, it has to be supported by customer experience reports. This is important because of the strong word of mouth information exchange of the community.
- The information on Internet has to be reliable, up-to-date, detailed and accessible. Internet is the media which is available from everywhere, any time, for a broad number of people.

A three country hotel analysis (UK, USA and Australia) published in 2007 showed that only 12% of the hotels passed even Priority checkpoints 1 of the WCAG 1.0 (Williams & Grimes 2007). Another study on German and UK tourist information sites from 2004 showed that only 20% complied with Priority 1 checkpoints, and merely 3% with Priority 2 checkpoints (Williams 2004). This underlines that although both web accessibility and accessible tourism have become a matter of concern in research and legislation, in reality web accessibility in tourism and especially in the hotel sector is still in its infancy. The main reason for this is the lack of awareness, understanding and/or ignorance of the problem (Neumann & Reuber 2004, Pühretmair 2004, Williams & Grimes 2007, Williams 2004).

As stressed before, internet is one of the major information sources when planning a holiday. It can also be used for booking different services online. This opens up the possibility to conduct the whole planning and booking process from home, on Internet,

without any media breaks. It would be even more convenient for people with disabilities to be able to conduct this process on their own from home without having to go to a travel agency or picking up the phone

In Austria, the following options are available for people with disabilities who search online for hotels that can accommodate their needs:

1. *Hotel web page*: users can either go directly to the hotel web page they know, have been to before, heard from somebody about or conduct a web search and choose from the search results. It is not ensured whether the hotel web page will be accessible. Mostly, direct contact with the hotel has to take place in order to get the required information on accessibility.
2. *Travel and booking platforms*: these sites have large databases with many searching and filtering possibilities. Generally they do not provide information on accessibility beyond wheelchair accessibility, whereas it is also not clear based on which criteria are they classified as wheelchair friendly hotels. They also offer instant booking possibilities which speeds up the planning and booking process. Internationally, the largest travel platforms are Tripadvisor.com and Expeda.com (Alexa 2008). The biggest Austrian travel platform is "Tiscover" (Netcraft 2008) which also offers a limited search possibility on accessibility. Furthermore, the web page itself is not accessible.
3. *Information platforms for people with disabilities*: Besides other useful information, these information platforms sometimes contain a database on accessible hotels and are maintained by interest groups, non-profit organizations or private persons. Everybody can request to be listed free of charge, and the hotel usually has to provide detailed information on hotel accessibility. The platforms offer an advanced search option where everybody can search on their exact needs. The most extensive Austrian platform is the ibft.at, the "Infoplatform for Accessible Tourism in Austria", which contains over 200 tourism service sites. Unfortunately, basically none of these platforms include the information whether the hotel's web page is accessible. The platform only collects the relevant information, they rarely offer the possibility of direct booking. Therefore, users still have to contact the hotel directly for booking. Moreover, although providing valuable information, many of these platforms also lack basic web accessibility criteria.

4. *Designated sites of the regional tourist information systems*: they work on a principle similar to the information platform, as they collect information about accessible accommodation regionally which can be useful if one is interested in a specific region. These websites are mostly accessible, but rarely provide the possibility of instant reservation. Currently the states of Upper Austria, Styria and Tyrol offer tourist information sites designated for handicapped guests. Additionally, some cities have similar web pages, like Klagenfurt. The city webpage of Linz is fully accessible, providing all information in accessible form. However, they do not provide any information on the accessibility of the accommodation possibilities in Linz.

In cases where no direct booking is offered on a platform, one can decide to contact the selected hotel by phone or e-mail. However, this causes a media disruption; the guest is forced to change media in an information process. Choosing to go directly to the hotel web page is most of the time not a solution since the web pages rarely meet even the minimum requirements of web accessibility.

3.5. A hotel categorization model on accessibility

Similarly to other sectors in tourism (Buhalis et al 2005, Neumann & Reuber 2004, Pühretmair 2004), accessibility in the hotel sector is a complex issue, an accessible web page is not sufficient. In order to really meet the needs of people with disabilities the hotel itself has to be accessible and the guests have to be informed about the accessibility of the hotel. These factors can be combined in a three dimensional cube model, each dimension contributing to the creation of a new valuable asset. Figure 3 shows the hotel categorization model on accessibility, where the three axes are:

- *Physical accessibility of the hotel* (x-axis): it is indispensable that the hotel itself is accessible for people with disabilities. Diverse disabilities require different solutions, but minimum requirements should be met by all hotels;
- *Accessible hotel web page* (y-axis): the web page of the hotel should comply with WAI guidelines;
- *Providing information about the hotel accessibility* (z-axis): information on the level of accessibility of the hotel has to be displayed on the web page.

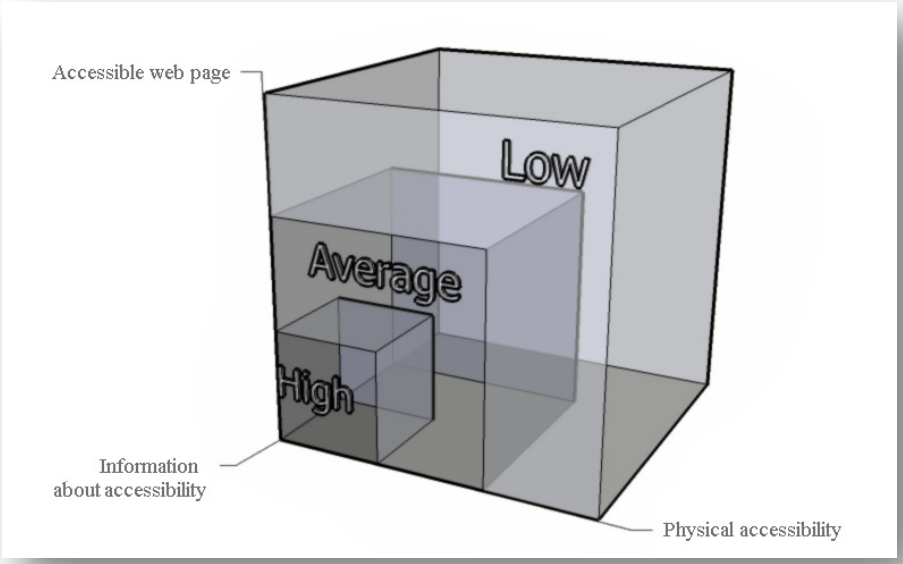

Figure 3: A hotel categorization model on accessibility (Erdey-Gruz et al 2009)

Based on mathematical foundations the three dimensions create a so called maximum norm (l_P-norm, where $p = \infty$). Let x_1, x_2, x_3 measure the coordinates of any point in the cube, where (0,0,0) is the best possible and the (1,1,1) the worst possible performance.

$$|| (x_1, x_2, x_3) ||_{max} = \max (x_1, x_2, x_3)$$

This approach states that given any three coordinates in a cube the value of the norm will be the maximum of the three coordinates. In this case, from the three factor, the overall value of the accessible hotel will be defined by the "weakest link", the factors that perform the poorest. Even if a hotel is physically accessible, it cannot provide full accessibility until it informs his guest about it in a way that is accessible for all. The advantage of this approach is that based on the three factors a value is assigned to each hotel, ensuring comparability and therefore benchmarking. Even with a simple method of assigning three sections (low, average, high) to each dimension it is possible to give a fairly good assessment of the accessibility of the hotel. A more precise analysis of the factors (continuous value in each factor) may provide a comprehensive approach to the issue. Only if all three criteria are met on high level a hotel can be considered accessible.

The literature review on web accessibility (cf. chapter 2) and Accessible Tourism (cf. chapter 3.3) can help to answer the research question of this thesis: *what are the business*

impacts of web accessibility in the hotel sector in Austria? With the help of statistical data based on previous studies the economic impact of accessible tourism in Austria was estimated. It can be concluded that there is a significant business volume behind both web accessibility and Accessible Tourism which so far has not been recognized by the stakeholders. The hotel categorization model showed how the web accessibility hotels can be made comparable.

Up to now, no comprehensive study on web accessibility of the hotel sector in Austria has been published. In order to gain further insight into the research topic, empirical analysis are required. Chapter 4 presents the findings of these empirical studies conducted in form of a case study research: firstly an evaluation on Austrian hotel web accessibility, secondly in-depth interviews with hotel managers on the motivations and impacts of web accessibility will be introduced.

4. CASE STUDY RESEARCH

Yin defines a case study as "*an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used*" (Yin 2002). Yin argues that a case study should be defined as a research strategy, an empirical inquiry that investigates a phenomenon within its real-life context. The case study research is based on a mix of quantitative and qualitative approaches, using multiple data sources like observations, interviews and documents. The case study research is advantageous in cases when the study:

- Has more variables of interest than data points are available;
- Relies on multiple sources of evidence;
- Benefits from prior theoretic propositions, guiding data collection and analysis;
- Has "how" and "why" research questions.

Yin distinguished between single (evaluation of one case) and multiple (evaluation of multiple cases) case studies. Due to reasons of validity, multiple case studies are preferred, single case studies are suggested only under certain conditions. Additionally, the research design can be holistic, when all data is analyzed as a single unit, while in an embedded case study design multiple units of analysis are contrasted. The chosen design depends on the research objectives.

This thesis is part of an exploratory case study research on web accessibility carried out by the Department of eBusiness of the University of Vienna in Austria. The research goal is to investigate the business and managerial benefits of web accessibility by using an embedded multiple case study design (cf. table 2). Four industry sectors with high relevance in electronic business have been selected for the research: tourism, financial services, retail, and information and communication.

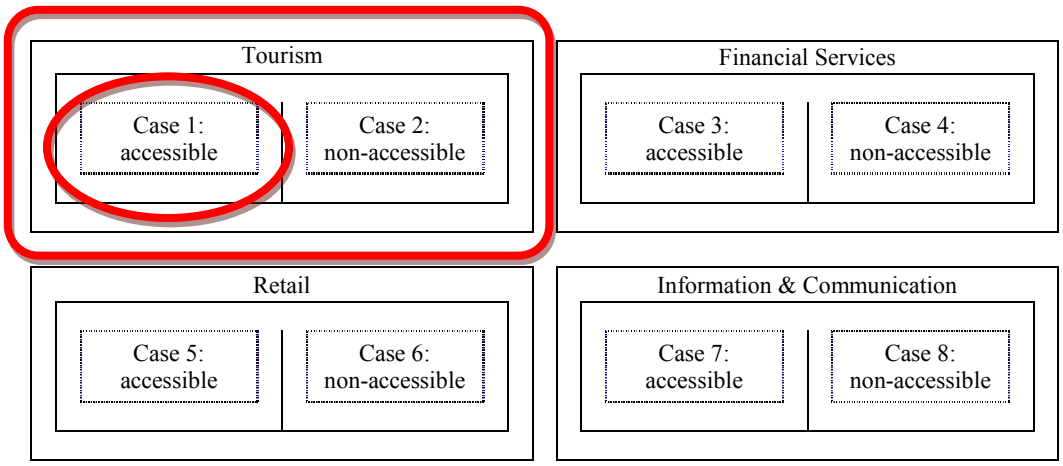

Table 3: Embedded multiple case study design for web accessibility (Leitner & Strauss 2008)

These four sectors represent day-to-day business with high relevance for people with disabilities (Leitner & Strauss 2008). The research is an exploratory, business-oriented analysis to explore the business motivations and economical impact of web accessibility in the hotel sector in Austria, using multiple sources of evidence. This thesis concentrates on case 1 of the tourism industry (cf. table 2): it examines the motivation and benefits of business in Austrian hotel sector that have implemented some level of web accessibility.

4.1. Research steps

Figure 4 shows the research steps of this thesis, whereas a combination of different methodologies was used in order to provide a comprehensive research.

STEP I:

- Literature review to assess the current situation and to explore any studies on hotel web accessibilities in Austria
- Creating a hotel categorization model on accessibility, to identify the dimensions of the accessibility of a hotel.

STEP II:

- Quantitative research to estimate the rate of accessible hotel web pages in Austria.

STEP III:

- Qualitative research to investigate the motivations and business benefits of implementing web accessibility, in form of in-depth interviews.
- Cross case analysis.

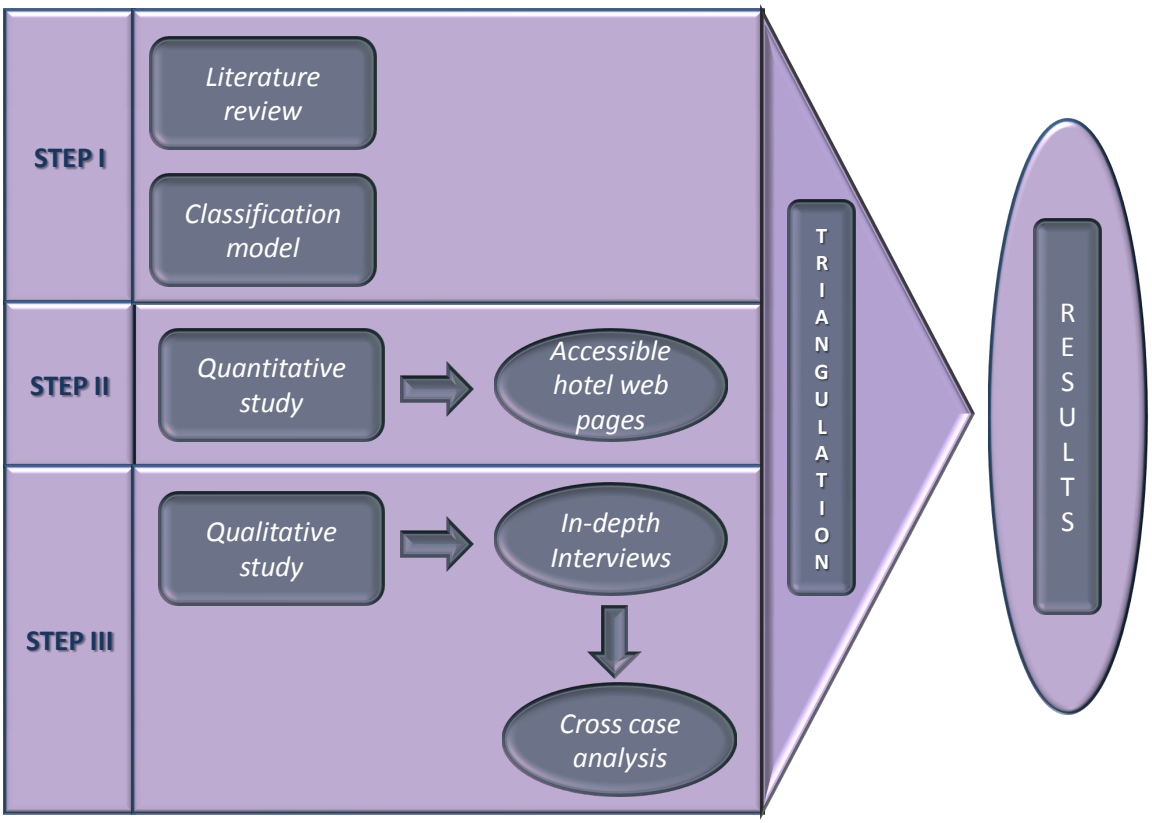

Figure 4: Research steps

The outcomes of each step are combined in the overall result of the research study with the help of the data triangulation method (combination of various sources of evidence). The results of evaluation of evidences are used to corroborate the same fact or evidence. In the triangulation method uses multiple sources of evidence, such as documentation, direct observation and interviews in the case study research increases the validation of results (Yin 2002).

In this thesis, chapter 2 and 3 covered step I (cf. figure 4), steps II and III are addressed in chapter 4.2 and 4.3.

4.2. Quantitative Research

4.2.1. Methodology

The literature review showed that no previous study has been conducted regarding web accessibility of the hotel web pages in Austria. Therefore the need for a new study was identified in order to explore the situation in Austria. The method used an evaluation framework which itself applies a three-step hierarchical approach. The approach of selecting the web pages for inspection was based on the hypothesis that those hotels that have shown a minimum awareness of the accessibility issue would most likely have accessible web pages. Figure 3 shows the evaluation framework for the process which was divided into three steps: (1) selection of the hotels; (2) automated tests; (3) manual tests.

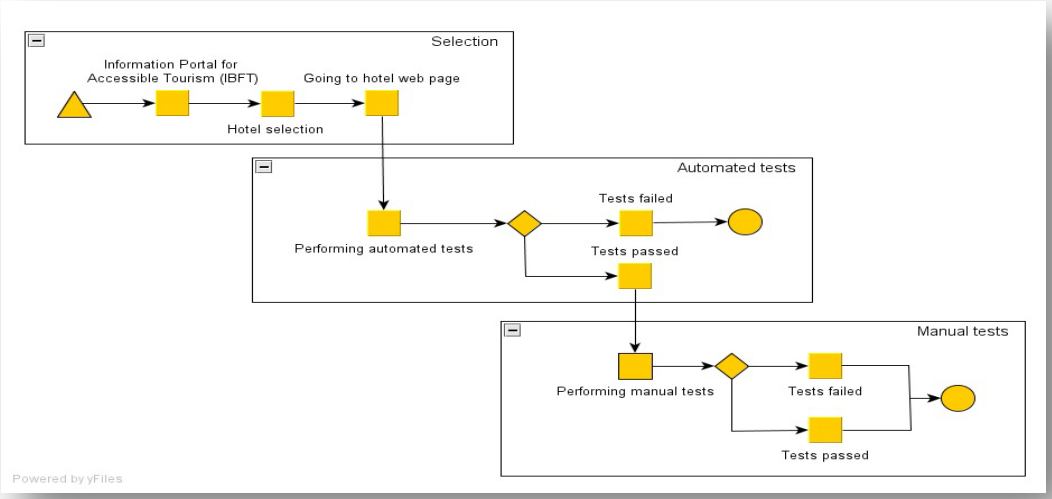

Figure 5: Evaluation framework

1. *Selection process:* the hotel pool was taken from one of the Austria's largest portals on accessible tourism, the Information Portal for Accessible Tourism (IBFT). IBFT, among others, collects information on accessible hotels and also provides links to other similar information portals, including regional tourist information portals. We have examined whether the Austrian hotels listed on IBFT have met the basic requirements for web accessibility.

2. *Automated tests:* All automated tests were performed on July 18, 2008. There have been many methods developed on examining the accessibility of a web page, like automated and manual checks of the WCAG Priority points, user testing, the Unified Web Evaluation Methodology and many more (W3C 2006a). Most of these checks require a long time and professional examination. For the purpose of this research we have chosen to use the Preliminary Review of the W3C (W3C 2006b) which offers a quick way to identify some basic accessibility problems. It does not check for all problems, therefore it is not suited for a conformity check of the Web Accessibility Guidelines, but it gives a good overview if a web page is generally suited to be accessible. After selecting a representative page sample — welcome page, booking page and accessibility information page, if available — first on each web site the following two steps were preformed, which can be done with automatic tools and are an absolute must to be passed for an accessible webpage:

   - Standard code validation;
   - Use of automated web accessibility evaluation tools.

   For these tests the online software Total Validator v.5.3.0, recommended by W3C, was used (Vos & Ambrose 2007). Since this version of the software does not check for java script errors and does not recognize if the whole webpage is flash, these checks were performed additionally.
3. *Manual tests:* Web pages that passed the automated tests were tested with the following manual tests:

   - Page examination using graphical browsers: Firefox 3.0 with Web Developer Plug-in was used to perform the following test: disabling images, checking for alt text; turning off sound; changing font sizes; testing with different resolutions; changing the display color to grayscale; navigating without the mouse;
   - Page examination using specialized browsers: the Lynx browser was used to examine if the information was displayed correctly on a text-only browser. Additionally, each website was screened for information on hotel accessibility.

4.2.2. Results

The summarized results of the quantitative research are shown in table 3. Only two out of 50 evaluated web pages passed both automated and manual tests. This does not mean that

these web pages are accessible, only that they meet the basic requirements of being accessible. Additionally, only 10% of the web pages indicate any information on the accessibility of the hotel.

Total number of hotel web pages checked	50
Total number of web pages failing the automated tests	44
Total number of web pages failing the manual tests	4
Total number of web pages that passed all tests	2

Table 4: Numerical results

The results of the evaluation were not surprising in the light of similar previously conducted studies (Williams & Grimes 2007, Williams et al 2004). 90% of the web pages failed the automated tests, 80% failed both automated tests with more than a couple of errors. This indicates a basic ignorance of accessibility, since these tests can easily be run by everyone, without any special expertise. Table 4 lists the evaluation protocol for each investigated hotel and the number of errors found on the web pages. Only one web page, Hotel Aster, has passed the automated test without any errors. However, it has failed the manual test as in Lynx the symbols were not displayed properly. Many web pages had HTML errors; this was not anticipated, since there are several HTML validation programs that can repair the errors automatically. Table 4 is divided into three parts:

- Green rows passed both automated and manual tests;
- Yellow rows passed automated tests, but failed manual tests;
- Red rows failed automated tests, therefore they were not tested manually.

The first column lists the name of the hotels whose web pages were inspected, based on the phase 1 of the evaluation framework. The next five columns show the results of the automated tests including the number of WAI, HTML, parsing and link errors, followed by the total number of errors detected. Column seven details any WAI errors that were not detected by the Total Validator, but belongs to phase 2 of the evaluation framework. The last column shows if the web page passed the manual test, including the reason in case it failed. The list was sorted in increasing order of WAI errors, followed by HTML errors.

Hotel name	Number of errors					Other WCAG errors	Manual errors
	WAI	HTML	Parsing	Link	Total		
Kolping Wien-Zentral	•	1	3	1	5	-	OK
Heilstollen Oberzeiring	•	21	3	•	24	-	OK
Hotel Aster's	•	•	•	•	•	-	Lynx
Thermen-Hotel Thersienhof Loipersdorf	•	28	•	•	28	-	Lynx
Hotel Grimmingblick	•	38	•	3	41	-	Lynx
Hotel Ohr	•	43	7	13	63	-	Lynx
Hotel Erla	•	2	•	•	2	flash	n/a
Hotel Innsbruck	•	4	•	•	4	flash	n/a
Thermenhof Paierl	•	9	2	2	13	frames	n/a
Marriott Courtyard Linz	•	13	5	•	18	JavaScript	n/a
Hotel Ibis Graz	•	33	•	•	33	JavaScript	n/a
InterContinental Hotels & Resorts	•	64	5	•	69	flash	n/a
Hotel Restaurant Spiegel	1	3	•	•	4	-	n/a
Young Austria Carinth / Mariapfarr	1	27	18	•	46	-	n/a
Hotel Restaurant Viktor	1	28	5	•	34	-	n/a
Young Austria Jugendhotels	1	29	11	•	41	-	n/a
Harry's Home Graz	1	96	•	1	98	-	n/a
Hilton Vienna Danube Hotel	1	114	8	1	124	-	n/a
Hotel Freunde der Natur	2	5	•	•	7	-	n/a
Hotel Silverio	2	5	•	•	7	frames	n/a
Vital-Hotel Styria	2	8	•	•	10	-	n/a
Loipersdorf Therme	2	30	5	•	37	-	n/a
Hotel Novotel Linz	2	31	1	•	34	-	n/a
Hotel Edlbacher Moor	2	78	1	•	81	-	n/a
Dorfwirt Haus Aloisia	3	5	•	•	8	-	n/a
Hotel Garni Gruber	3	8	•	•	11	-	n/a
Landhotel Sonnhof	3	9	•	•	12	-	n/a
Hotel Gallspacherhof	3	16	•	•	19	-	n/a

Hotel name	Number of errors					Other WCAG errors	Manual errors
	WAI	HTML	Parsing	Link	Total		
Grand Hotel Wien	3	18	2	1	24	-	n/a
Hotel Salzburg Hetterhof	3	38	•	•	41	-	n/a
Thermenhotel Lutzmannsburg	3	42	18	•	63	-	n/a
Hotel Wisseespitze im Kaunertal	3	66	12	•	81	-	n/a
Seminarhotel Salzburg	3	68	4	4	79	-	n/a
Austria Trend Hotels & Resorts	4	10	•	•	14	-	n/a
Gesundheitsresort Königsberg, Bad Schönau	4	11	•	•	15	-	n/a
Landhotel Liebman - Lassnitzhöhe	5	4	•	•	9	-	n/a
"G'Sund & Vital" Wellness-Hotels	5	9	1	•	15	frames	n/a
Laserz Ferienhotel	5	15	•	•	20	flash	n/a
The Penz Hotel	5	108	1	1	115	-	n/a
Hotel Traube	6	7	•	•	13	-	n/a
Landhotel Birkenhof	6	10	•	•	16	-	n/a
Steigenberger Hotel Linz	8	135	1	•	144	-	n/a
Hotel Hauser	9	138	2	1	150	-	n/a
Hotel zur Post Salzburg	12	33	3	•	48	-	n/a
Retter Hotel	15	69	15	•	99	-	n/a
Heiltherme Quellenhotel & Spa, Bad Waltersdorf	20	61	42	•	123	-	n/a
Gasthof-Hotel Schmied	22	47	•	•	69	-	n/a
Almfrieden Wander- & Langlaufhotel	46	89	5	1	141	-	n/a
Hotel Schwaigerhof	111	305	1	6	423	-	n/a
Hotel & Palais Strudlhof	298	402	57	•	757	-	n/a

Legend: • : no errors found; - : no other WCAG errors detected; n/a : not available

Table 5: Detailed list of errors

As can be seen in the table 4, some web pages passed the WAI check of Total Validator, but had other WCAG errors, that are usually tested by automated tools, but not by the Total Validator v.5.3.0. These errors were checked separately and included in the table. Firstly, if a web page contains JavaScript in the code it is considered as failed, since if JavaScript is turned off, some links do not work. Another problem group was web pages that use flash animations in the major part of their web page. Screen readers, just like automated accessibility software are not able to comprehend and handle the information within the animation, hence these web pages cannot be considered accessible. Three web pages were using frames, without the adequate accessible frame information. Frames are not preferred because screen readers cannot change between frames, unless they are labeled. The WAI check has a higher priority than the HTML check. Therefore, those web pages, which had no WAI errors and just some HTML errors, were permitted to the manual test phase.

Four out of the six web pages that have passed the automated tests had failed the manual test. All four have problems displaying symbols and umlaut letters in the Lynx text browser, which makes the content unreadable. Therefore, out of 50 web pages only two hotels' web page have passed the evaluation.

The quantitative research performed in this chapter shows that currently only few hotel web pages in Austria meet even the basic web accessibility requirements. The following chapter presents a qualitative research conducted as step III of the study on the business impacts of web accessibility in the Austrian hotel sector, and investigates the motivations and benefits of implementing web accessibility.

4.3. Qualitative Research

4.3.1. Methodology

For further understanding of the motivation for web accessibility and the economical benefits of implementing accessible web pages, in-depth interviews were conducted with selected hotels.

The in-depth interviews followed the standardized guidelines of the exploratory case study research. Table 5 shows the conceptual framework which is split into two tracks: organizations with or without accessible web presence.

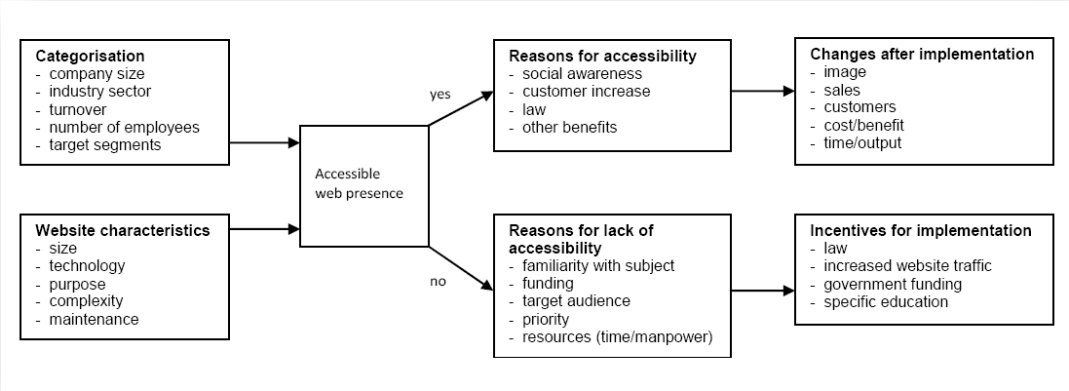

Table 6: Conceptual framework for case study research on business impacts of web accessibility (Leitner & Strauss 2008)

In the first case (upper track of table 5), the focus lies on revealing the reasons for implementation and identifying changes in terms of costs, benefits, image and sales. In the second case (lower track of table 5) the focus is on the determination of reasons for the lack of accessibility and identifying possible incentives for implementing accessibility (Leitner & Strauss 2008).

This study focused on cases where the basic accessible web presences were detected. The selection process of the interviewees was based on several factors:

- Adequate web page, that has the basic affinity towards web accessibility;
- Listed on an accessible tourism platform or took part in a research project regarding web accessibility;
- Was willing to take part in this research.

These criteria narrowed the eligible hotels significantly. Finally two hotels were selected for in-depth interviews: Hotel Heffterhof and Hotel Krallerhof.

The interview process followed the steps laid out by Miles & Huberman (Miles & Hubermann 2005). In each case the process consisted of the following steps:

- Initial contact with the hotel and arranging of the meeting;
- Forwarding the question guidelines to the manager (see Attachement B);
- Conduction of an audio-taped interview (duration: 60 minutes) with the assigned manager (interview language: German);
- Transcription of the audio record in German;
- Coding of the content;
- Summarizing the content in English;
- Conducting a cross-case analysis.

4.3.2. In-depth interview summaries

Hotel Heffterhof

Hotel Heffterhof is four-star conference hotel located in city of Salzburg. It has met the selection criteria, since their webpage (www.heffterhof.at) is fairly accessible, they are listed in the IBFT database and were willing to participate in this study. The interview was conducted on June 11, 2008 in Salzburg at the Hotel Heffterhof and lasted for an hour which resulted in a transcript of 5682 words. The interview partner was Ms. Manuela Speissberger, the marketing manager of the hotel.

The interview was conducted just before the new homepage was launched. Figure 6 shows a snapshot of both old and new web page. A short analysis of both web pages will follow:

- *The old web page:* it was launched more than 5 years ago, but 2 years ago it had a major adaptation regarding web accessibility. Possibilities to change the letter size, alt text and other accessibility features were added. No advanced solutions, such as flash or java were used. The web page provided information about the physical accessibility of the hotel.
- *The new web page:* it was launched on July 1, 2008, a few weeks after the interview took place. The intention was to create a more sophisticated web page, which would be even more accessible. Unfortunately the new webpage is using JavaScript solutions, which in this form is not accessible. If JavaScript is turned off, some links like the reservation request do not work. There is no indication of any accessibility Quality Mark, such as a W3C logo. The web page provides extensive information on the physical accessibility of the hotel.

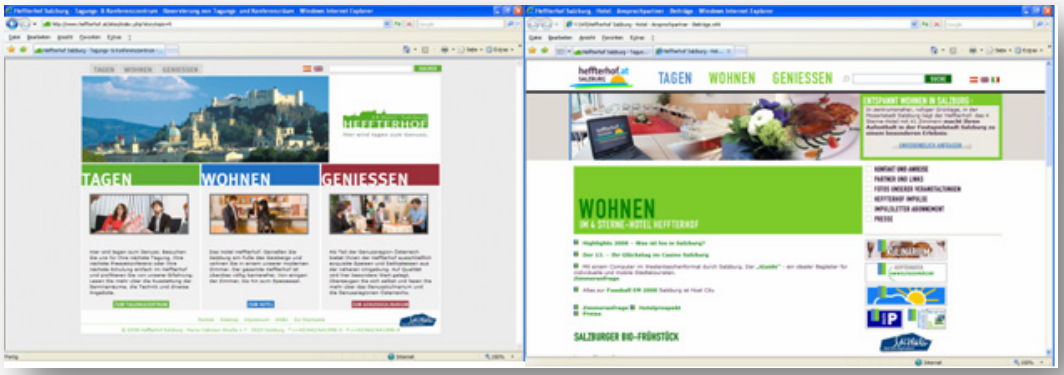

Figure 6: Screenshot of the new and old home page of the Hotel Heffterhof

Summary of the in depth interview based on the question guidelines of the conceptual framework:

Introduction:

The "Web Accessibility Quality Management" project was introduced, followed by the short introduction of the interviewer.

The Hotel

Information on the company:

Hotel Heffterhof was founded 60 years ago, and is owned by the Regional Chamber of Agriculture, but it is managed as a commercial business. The hotel has 82 beds, and it has undergone a major reconstruction for six years. The hotel has a staff number of 19 people. The main profile of the hotel is conference tourism, with 60% of business realized in this field, which means hosting 700-750 events yearly. The other 40% of business is realized through individual tourists and tourist groups. The hotel has a lot of B2B contacts and predominantly domestic guests. The main seasons for the seminars are between January and June, and between September and December. Private guests prefer summer season. Besides accommodation and conferences, a major product of the hotel is the so called "Genusskulinarium im Heffterhof", that presents regional and local agriculture products in form of seasonal focus weeks.

Corporate Social Responsibility

Although not declared as a CSR program, Hotel Heffterhof conducts its business with respect to social responsibility. The hotel philosophy is to protect the environment and has a consistent sustainability-orientated approach in the day-to-day business management. The hotel was built of wood, coming from Austrian forests, while 80% of the heating is done with wood chips. The food in the frame of the "Genusskulinarium" comes also from local, bio farmers.

Another major focus is on the accessibility of the hotel. During the remodeling, 8 accessible rooms were created, 4 single bed rooms, and 4 rooms offering the possibility to accommodate an escort. All these rooms are equipped with special furniture that can be adjusted to requested size. 11 out of 12 seminar rooms and all common rooms are fully accessible with a wheelchair including the outdoor terrace. One staff member has special training on interacting with people with disabilities. The decision to build the whole hotel in an accessible way came from the management, mainly due to social reasons. Neither economical nor legal aspects were considered.

The characteristics of the web page

The webpage was about to have its relaunch, therefore the information referred to the new webpage. It has 3 main navigation menus, with approx. 18 submenus and 25 other pages, all together 24 pages. The previous web page was launched five years before, with a major change two years ago. Ms. Spiessberger is responsible to manage the webpage context, while the technical changes were conducted by a web master. The main functions of the web page are to provide information to potential guests and to encourage visitors to book this hotel. Therefore, the web page should be able to capture the visitors' attention, and to keep them on the webpage for longer time. An important reason for relaunch was to be able to concentrate more on Search Engine Marketing, because it is not enough to have a good web page, if people are not able to find it. A further motivation behind the relaunch was to extend the accessibility information on the web page. The new web page should obviously be accessible, which was communicated towards the web designer. According to Ms. Spiessberger the cost of the new webpage did not increase because of the implementation of accessibility.

Reasons for implementing web accessibility

The main reason for implementing web accessibility was that the hotel itself is highly accessible, an information that had to be promoted. In a first step, only little information was included about accessibility, but with time more and more accessibility information was indicated. The reason for this was the increasing number of guest with impairments, who enjoyed their stay at the hotel.

Ms. Spiessberger interpreted web accessibility more as information about accessibility on the web page, and less in its technical meaning, i.e. having a web page that meets the WCAG requirements. Moreover, she had never heard about W3C before, and was not aware that their old web page met the Priority 1 of WCAG in many points. She said the new web page would be definitely even more accessible, since they wanted to have a web page that is a "design for all". There is no W3C logo on the web page, because they were not aware of it, but if there is no quality guarantee behind it, they might not be interested.

Observations after the implementation

When the first accessible web page was implemented, they have not followed any statistics on the new webpage and have not undertaken any cost analyses regarding the new web page. They have not received any specific negative or positive feedback on accessibility, but overall, the guests are satisfied with the web page. There is a notable tendency of an increasing number of guests with impairments. It is difficult to say what the source of information for these guests is. Ms. Spiessberger confirmed that this group of guest is very faithful and likely to return to the hotel. Currently over 10% of the guests have impairments. Also, after displaying information on accessibility, several disability organizations have approached the hotel and included it in their database, such as the IBFT, the Rollstuhl.de and the Swiss Paraplegics Foundation. Additionally, the city of Salzburg has an accessibility information point where the hotel is also listed as an accessible accommodation. Many guests with disabilities are able to find the hotel through these channels.

Future plans

In the immediate future the web relaunch is the most important activity. The first few months will be a test phase and the results will be analyzed. There will not be any comparison between the old and new web page. A possible Quality Mark would be definitely something that the hotel would be interested in if the costs involved are

reasonable. The hotel has other Quality Marks in the field of bio products, for which they also pay an annual fee.

Regarding the general attitude of the hotel sector towards accessibility, Ms. Spiessberg agrees that currently only few managers realize the potential of accessible tourism, partly because they are not aware of the economical importance of this group. Financial subsidy may help to motivate the managers, but without own social stimulus it will not be enough to promote accessibility. However, she thinks many more managers will realize the growing economical potential of this group. People with disabilities are more and more mobile with the help of new assistive technologies, and the elderly generation is willing to travel even more, and they are using more often the internet than 5 to 10 years ago.

Hotel Krallerhof

The family run four-star Alpine Hotel Krallerhof is located in a small town Leogang in the Province of Salzburg. The hotel has 118 rooms and an extensive renowned wellness and spa center. The hotel was selected for this research based on their involvement in the study "Barrierefrei online" conducted for the sensi_tec project (Stadler-Vida & Giedenbacher 2005). The interview was conducted on August 6, 2008 in Leogang at the Hotel Krallerhof with Mr. Gerhard Altenberger, director of the hotel. The discussion lasted for an hour and resulted in a transcript of 5792 words.

Figure 7 shows a snapshot of the current web page. The web page has passed the automated priority check of the WCAG with no errors; however it contains no information on the physical accessibility of the hotel. Typo3 content management system was used for the web page, which has accessibility extensions available. There is no indication of any accessibility Quality Mark, such as a W3C logo.

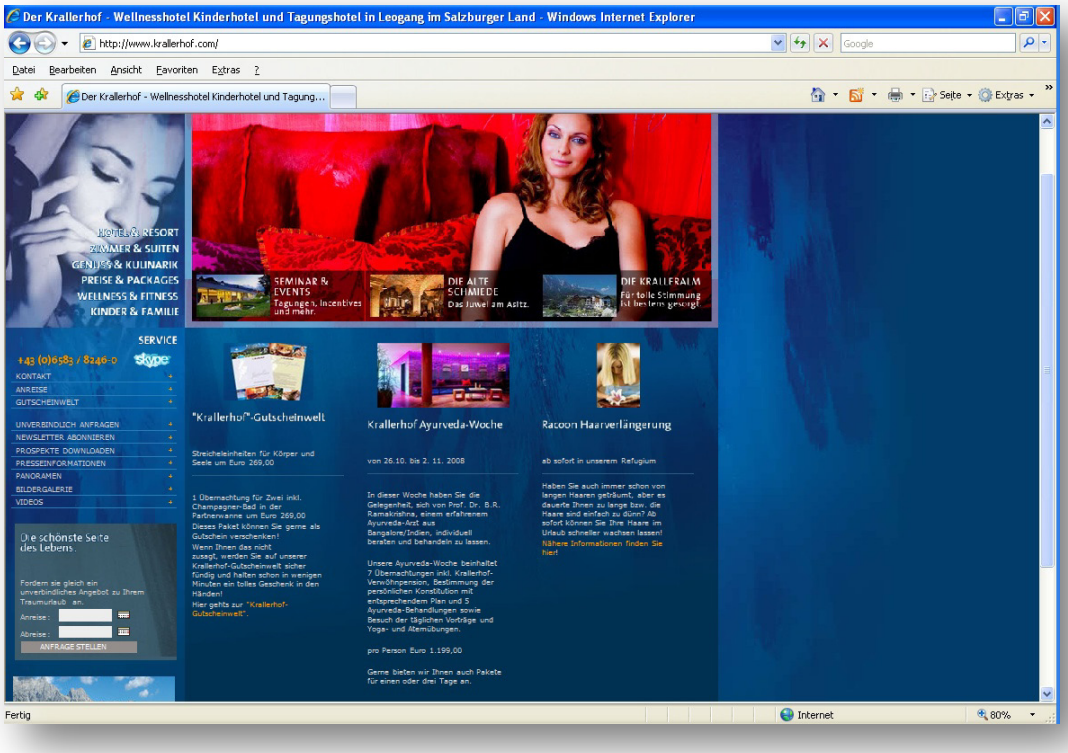

Figure 7: Screenshot of the home page of the Hotel Krallerhof

Summary of the in depth interview based on the question guidelines of the conceptual framework:

Introduction

The "Web Accessibility Quality Management" project was introduced, followed by the short introduction of the interviewer.

The Hotel

Information on the company

Hotel Krallerhof has a staff of 140 people, which increases in winter to 200 people, the annual turnover is about 13 million Euros, with over 120 euro revenue per guest. The hotel has 223 normal-guest beds in 118 hotel rooms and 9 conference rooms. The occupancy is around 89%. The main target groups are wellness guests, families and conference guests. Guest with impairments are below 1%.

Corporate Social Responsibility

There is no declared Corporate Social Policy in the company, but the company's basic attitude is sustainability and social responsibility. The support of the regional industry has a high priority – the hotel lives from its environment and nature. The whole establishment is heated with locally purchased wood; most part of the food is being grown in the region and is categorized as bio products. For environmental protection solar cells are being used. The management has a design for all approach, which includes making the hotel and the web page accessible for all. People with disabilities do not represent a separate guest group and are not being targeted. The spa, conference and common areas, as well as some bedrooms are accessible by wheelchair.

The characteristics of the web page

The current version of the web page was launched four years ago. The web page uses easy language, short sentences with few foreign words. The user can choose from five different languages. The letter size can be changed, the text and pictures are clearly separated. The web page has no animations and background music. The code is HTML based and has accessible navigation. The layout has been specially designed for "easy to use" navigation in order to avoid overwhelming the user with information. The webpage has never been checked for web accessibility.

Reasons for implementing web accessibility

Hotel Krallerhof was one of the first to create a hotel web page and was always trying to quickly adopt the newest technical developments, such as JavaScript and flash animations. Soon they realized that their guests had difficulties to load the web page, since most of them had slow internet connection and/or older computers. They have received several guest complaints regarding the web page. As a consequence, the management has decided to create a completely new web page and has consulted with a specialist who happened to have extended knowledge on "design for all" web pages. He suggested designing a web page considering these guidelines. Complicated solutions are a hindrance to a web page, and music causes problems for those, who visit the web page from their work place. The second director of the hotel has a visual impairment and therefore uses a low resolution when looking at web pages. Therefore, it was important that their own web page complied with those requirements. It was difficult to find a web designer who could meet the above mentioned requirements, only the second version of third web agency met the expectations.

Observations after the implementation

An accessible webpage can still have a good design. Although the initial development of the web page might have cost more, in the long run it is definitely cost-efficient to have an accessible web page. The maintenance costs are incredibly low, the design does not have to be constantly changed since it does not follow any new trends. Based on the guests' feedbacks, the web page is successful. The guests do not realize that it is an accessible web page, but intuitively find it easy to read and navigate on. Almost all guests visit the hotel's web page prior to arrival in order to gain more information about the hotel. The internet appearance of a hotel is very important; many guests are using travel community platforms like holidaycheck.de to exchange information on their experience, and to publish the web pages of hotels. The hotel spends approximately six to eight thousand Euros yearly on search engine marketing, to ensure a high landing place on Google search.

Future plans

The webpage has no information about the physical accessibility of the hotel because the management has not paid attention to that issue before. Having received information about physical accessibility in the interview, the management will be considering an implementation in the future. A Quality Mark would be interesting even if it would involve costs. At the moment most hotel managers are not aware of these issues, and have not appropriate information about web accessibility. A presentation at the annual Austrian conference of the hotel sector would be a great idea. Since the hotels are always looking for new possibilities to create competitive advantages and are investing money in finding different solutions, information on the economical advantages of web accessibility is anticipated as a great success.

4.3.3. Cross-case analysis

The two interviews bear a lot of similar statements, although they have different approaches to accessibility. It is interesting to observe, that the managers of both hotels are socially very sensible. The notion of accessibility is based on social ground, but both hotels acknowledge the economic advantages of accessibility, including web accessibility. Legal consideration was not an aspect in implementing web accessibility. Both hotels are physically accessible, but only Hotel Heffterhof promotes it on their

website hence the notable difference in the number of guests with disabilities. Table 6 compares the statements of the two interviews regarding some key issues.

Statements	Hotel Heffterhof	Hotel Krallerhof
CSR	Present, not declared	Present, not declared
Parts of social responsibilities	Sustainability – wood chip heating, support local industry, bio products; Accessible hotel	Sustainability - wood chip heating, solar cells, support local industry, bio products Accessible hotel
People with disabilities	Declared target group	Not a target group
Ratio of guest with disabilities	Above 10%	Below 1%
Travel patterns of disabled guests	Loyalty Increasing mobility	No remarks
Hotel's accessibility	Fully accessible by wheelchair, above general regulations	Accessible by wheelchair, along with the general regulations
Web Accessibility	Partly present, unconscious	Present, conscious
Accessibility information on the web page about the hotel	Extensive information on the web page	No information available on the web page
Motivation for web accessibility	Provide information on accessibility of the hotel	Provide web page that is accessible for all
Economic advantage of web accessibility	Increasing number of guests with disabilities	Low maintenance costs
Value of web accessibility	Competitive advantage	Competitive advantage
Future of web accessibility	In coming years will gain in importance, other hotels will implement it as well	In coming years will gain in importance, other hotels will implement it as well
Quality Mark	Is interested in it, are ready to pay for it, if there is a quality behind it	Is interested in it, are ready to pay for it, if there is a quality behind it

Table 7: Comparison of the statements of Hotel Heffterhof and Hotel Krallerhof on key issues of accessibility

As both interviews have been conducted on site, it was possible to determine the physical accessibility of the hotels. Since this study does not analyse the question of physical accessibility extensively, only a rough estimation was made in both cases. Both hotels can be placed in the hotel categorization model on accessibility (c.f. chapter 3.5), since all three dimensions can be assessed at these hotels. Table 6 summarizes the values the hotels reached in the different axis. Each dimension was rated in a 3 stage scale. High was given if it met the required quality for being able to call it accessible, low was given, if it has not met any of the requirements of accessibility. Average was assigned when some aspects of accessibility have been met, but deficiencies were detected.

	X-axis: Physical accessibility	Y-axis: Accessible web page	Z-axis: Information on accessibility	Accessibility value (Max norm)
Hotel Heffterhof	*HIGH*	*AVERAGE*	*HIGH*	***AVERAGE***
Hotel Krallerhof	*HIGH*	*HIGH*	*LOW*	***LOW***

Table 8: Categorization on accessibility of Hotel Heffterhof and Hotel Krallerhof

Using the maximum norm approach (c.f. chapter 3.5), it can be concluded, that the overall accessibility value of Hotel Heffterhof is average. Although Hotel Heffterhof recently has launched a new web page, it needs to review its web accessibility and implement some technical changes, such as refraining from using java script. This can be reached with low to medium costs involved, depending on the web designers' work involved.

The overall accessibility value of Hotel Krallerhof is low. This can be significantly improved with low costs involved, since with the current Content Management System it should be relatively easy to add new content. As soon as the hotel provides extensive accessibility information on the web page, the overall accessibility value of the hotel will be high.

5. CONCLUSION

The above chapters examined several issues in order to answer the main research question of this thesis: *what are the business impacts of web accessibility in the hotel sector in Austria?* It can be concluded that web accessibility in the hotel sector has unambiguous economical advantages, however so far it has not been widely recognized by the business actors in Austria.

The literature review on web accessibility and accessible tourism helped to gain an overview on the current status in these areas. Estimations based on statistical data were used to better comprehend the economical impact of web accessibility in the Austrian hotel sector. The introduced hotel categorization model on accessibility can be used to evaluate the status quo of hotel accessibility and may therefore provide a valuable tool for further benchmarking activities. In addition, the model indicates possible ways of improvement for the evaluated hotels.

Quantitative and qualitative studies were used to assess the implications of web accessibility in the hotel sector in praxis. The study on the accessibility of the Austrian hotel web pages showed that currently only a fraction has implemented web accessibility. The conducted in-depth interviews revealed that implementing web accessibility doesn't require extra investment and has advantages for all costumers. The interviews also confirmed the results of previous studies: travelers with disabilities may represent a significant guest group, are very loyal to the place they like and they are increasingly mobile. The cross case analysis of the in-depth interviews also showed, that it is not enough to have an accessible hotel and web page, the accessibility also has to be promoted, so that people with disabilities can find these hotels.

From an organizational perspective, people with disabilities represent a significant consumer group that is currently largely excluded from both online activities and traveling and therefore represents an unexploited market potential. The few studies that have been conducted in the area of web accessibility in tourism show a considerable lack of awareness of organizations on this issue (cf. Neumann & Reuber 2004, Pühretmair 2004, Williams & Grimes 2007, Williams et al 2004). Moreover, hardly any studies on economic impacts of web accessibility have been carried out so far. This research gap is currently being explored by an initial pilot study which uses exploratory case study research in order to determine an organization's motivation for web accessibility

implementation and the resulting business and economic benefits (Leitner & Strauss 2008).

Additionally, this contribution implies that an increase in the awareness of web accessibility is an indispensable prerequisite for a future amelioration of the status quo of web accessibility in the tourism sector. Decision-makers have to be aware of the issue, have to be informed about the needs of people with disabilities and the potential market they represent. A good example for this is Germany where an initial study of the Federal Ministry of Economics and Technology on the Economic Impulses of Accessible Tourism for All was conducted (Neumann & Reuber 2004). Due to a significant development in Accessible Tourism in Germany after the publication of this study, a follow-up study in fall 2008 assesses the key factors of success and measurements for quality control (Neumann et al 2008).

In order to promote web accessibility, the government may enforce existing regulations more effectively on the one hand; on the other hand provide financial support for implementing accessible web presence. Otherwise, small enterprises will not be able to invest in professional web development. But most importantly, the entrepreneurs have to be sensitized towards people with disabilities.

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APPENDIX A

Abbreviations

ARIA	Accessible Rich Internet Application
ATAG	Authoring Tool Accessibility Guidelines
B2B	Business to business
CSR	Corporate Social Responsibility
CSS	Cascading Style Sheets
DIN	German Institute for Standardization (Deutsches Institut für Normung eV)
ERP	Enterprise Resource Planning
EU	European Union
EUROSTAT	Statistical Office of the European Community
GDP	Gross Domestic Product
HTML	HyperText Markup Language
ISO	International Organization for Standardization
OSSATE	One-Stop-Shop for Accessible Tourism in Europe
PDA	Personal Digital Assistant
UAAG	User Agent Accessibility Guidelines
UNWTO	United Nations World Trade Organization
USA	United States of America
W3C	World Wide Web Consortium
WAI	Web Accessibility Initiative
WCAG	Web Content Accessibility Guidelines
WHO	World Health Organization
XHTML	Extensible HyperText Markup Language

APPENDIX B

Interview Questions Guidelines (German)

Leitfaden Expertengespräch

Sofern Sie damit einverstanden sind, wird das Expertengespräch auf Tonband aufgezeichnet, um die wissenschaftliche Nachvollziehbarkeit sicherzustellen.

Teil 1: Unternehmensdaten

- Kurzbeschreibung der eigenen Position im Unternehmen bzw. des Aufgabenbereiches
- Beschreibung des Unternehmens (Größe, Mitarbeiterzahl, Umsatz, Branche, Produkte, Services)
- Rolle von Corporate Social Responsibility im Unternehmen

Teil 2: Webseiten Charakteristika

- Beschreibung der Webseite (Seitenanzahl, Technologien, Wartung, Updates, Relaunches)
- Zweck der Webseite (Verkauf, Informationseinholung, Bedeutung der Webseite)

Teil 3: Gründe für Implementierung von Barrierefreiheit

- Ausschlaggebende Gründe für die Einführung von barrierefreiem Web
- Erfahrungen mit der Umsetzung von barrierefreiem Web (Positive Erkenntnisse vs. Eventuelle Schwierigkeiten)
- Voraussetzungen für die Einführung von barrierefreiem Web
- Einflußfaktor Kosten
- Einflußfaktor Gesetz
- Einflußfaktur soziales Engagement

Teil 4: Erfahrungen nach der Implementierung

- Änderungen nach der Implementierung (Webseite, Anzahl Konsumenten, Image, Usability, etc.)
- Erfahrungen mit Implementierungsprozess
- Wirtschaftliche Rentabilität von barrierefreiem Web
- Meßbarkeit der Auswirkungen von barrierefreiem Web
- Marketingmaßnahmen für barrierefreie Unternehmenswebseite
- Anreize für die Einführung von barrierefreiem Web in der Privatwirtschaft

Teil 5: Zukünftige Entwicklungen

- Zukünftige Entwicklungen von barrierefreiem Web
- Erwartungen an den barrierefreien Webauftritt des Unternehmens

APPENDIX C

Curriculum Vitae

Maria Erdey-Gruz, B. A.

University of Vienna
Faculty of Business, Economics and Statistics
Bruenner Strasse 72
1210 Vienna, Austria

e-mail: egmaria@yahoo.com

EDUCATION

2006 October – 2008 November	University of Vienna, Austria; Master of Business Administration, Majors: IT Management, E-Business;
1997September – 2004 January	Budapest Business School, Hungary, BA Hotel and Tourism Management, minor: European Studies, Graduated with excellence;
2003	Two semesters at the University of Applied Studies, Bielefeld, Germany within the frame of the Erasmus program.

PUBLICATIONS

Erdey-Gruz, M., Leitner, M.-L., and Strauss, C. (2009), Web Accessibility in the Austrian Hotel Sector, in: Proceedings of 9th International Conference on Business Informatics (WI2009), Vienna, (Austria), 25th-27th February, 2009 (*to appear*)

Bauer, C., Erdey-Gruz, M., Leitner, M.-L., and Strauss, C. (2007), AT Management, accessible textbook, Assistec University Course, Linz.

Erdey-Gruz, M. (2003): Recruitment and Selection in the Hotel Sector and the Analysis of the "Talent+" System, diploma thesis, Budapest Business School.

Erdey-Gruz, M. (2003): Fortress Europe – The Political Problems of the Migration Policy of the EU, diploma thesis, Budapest Business School.

SPOKEN LANGUAGES

Hungarian and Russian (native languages)

English and German (fluent)

APPENDIX D

Abstract (English)

This contribution aims to investigate the business impacts of web accessibility in the tourism industry with the focus on the Austrian hotel sector. Case study research methods are used for the research.

The results of the conducted studies verify previous research, showing that tourism stakeholders considerably lack awareness of web accessibility. The literature review on web accessibility and accessible tourism gives an overview on the current status. Estimations based on statistical data are used to assess the economical impact of accessible tourism in the Austrian hotel sector. A three dimensional hotel categorization model on accessibility is introduced to encompass the complexity of accessibility in the hotel sector. It can be used to evaluate the status quo of hotel accessibility and may therefore provide a valuable tool for further benchmarking activities.

Quantitative and qualitative studies are used to assess the implications of web accessibility in the hotel sector in praxis. The study on the accessibility of the Austrian hotel web pages shows that currently only a fraction has implemented web accessibility. The conducted in-depth interviews reveal that implementing web accessibility doesn't require additional investment and has advantages for all costumers.

The interviews also confirm the results of previous studies: travelers with disabilities can represent a significant guest group, are very loyal to the place their like and they are increasingly mobile, this groups of travelers is ever more important. Additionally, this study confirmed that accessibility has to be promoted, so people with disabilities can find these hotels.

APPENDIX E

Abstract (German)

Diese Magisterarbeit behandelt die wirtschaftlichen Auswirkungen von barrierefreiem Web im Tourismus Bereich und fokussiert dabei insbesondere auf die österreichische Hotelbranche.

Ein Literatur Review gibt vorerst einen Überblick über die gegenwärtige Situation von barrierefreiem Web und barrierefreiem Tourismus. Ferner werden mit Hilfe von statistikbasierten Schätzungen wirtschaftliche Auswirkungen von barrierefreiem Tourismus in der österreichischen Hotelbranche ermittelt.

Um die Komplexität der Barrierefreiheit in der Tourismusbranche adäquat darstellen zu können, wird ein drei-dimensionales Hotelkategorisierungsmodell entwickelt, mit Hilfe dessen die Evaluierung des Status quo eines Hotels im Hinblick auf Barrierefreiheit vorgenommen werden kann. Darüber hinaus ist dieses Kategorisierungsmodell für weiterführende Benchmarking Aktivitäten einsetzbar.

Eine Fallstudien-Analyse vereint quantitative und qualitative Forschungsmethoden und untersucht die betriebswirtschaftlichen Effekte von barrierefreiem Web in der Hotel Branche. Ergebnisse zeigen, dass derzeit nur ein Bruchteil der österreichischen Hotels über eine barrierefreie Webseite verfügt, obwohl durch die Implementierung von Barrierefreiheit zusätzliche Investitionen entfallen würden sowie Vorteile für alle Kunden generiert werden könnten.

Die im Zuge dieser Magisterarbeit durchgeführten Studien bekräftigen bisherige Forschungsergebnisse, welche das fehlende Bewusstsein von Tourismus Akteuren in Bezug auf barrierefreies Web als Hauptgrund für die mangelnde Implementierung identifizierten. Ferner kann festgestellt werden, dass Reisende mit Beeinträchtigungen eine wirtschaftlich signifikante Touristengruppe darstellen und in ihren Eigenschaften sehr loyal und zunehmend mobil sind.