

Czech University of Life Sciences Prague

Faculty of Economics and Management

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Diploma Thesis

**The Role of Web Design and Web Accessibility in Attracting
Customers to the Business**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Thesis title

The Role of Web Design and Web Accessibility in Attracting New Customers to the Business

Objectives of thesis

The main objective of this Thesis is to analyze how Web Design and Web Accessibility is influencing the customer attraction of the business. The aim of this paper is to investigate the importance of Web Design and Web Accessibility in terms of business attractiveness. In this Thesis there will be also demonstrated what tools and technologies are used to develop attractive and user-friendly, but at the same time functional and high quality web site to inspire confidence of the customer. There will be explored step by step all of the major components of web design, and also there will be analyzed the basic elements of web accessibility and its application. The main objective of the thesis is to show in theory all of the stages, that should be considered in creating a functional and accessible web page. Significant part of this paper is devoted to the research of how disabled people may influence a company performance, by getting broader access to the market through the accessible web.

Methodology

The methodology of this study is based on analysis and synthesis of technical information resources dealing with selected issues. The importance of web accessibility and its development will be analyzed. The essential components of web accessibility, its technologies and guidelines are going to be examined in this Thesis. Based on the synthesis of theoretical knowledge and practical results of the findings, there will be conclusions of thesis formulated. This research is made, by collecting the most recent and valuable statistical and theoretical data, and by analyzing the materials in the form of evaluation the importance of accessible web for disabled people, as well, as for the businesses. This Thesis is created by processing the given data and by performing the comprehensive assessment of the probable impact of Web Accessibility on the economy in general.

The proposed extent of the thesis

60 – 80 pages

Keywords

Web Accessibility, Web Design, interface, WCAG 2.0 guidelines, influence, disabled people, economy, growth

Recommended information sources

CASTRO, Elizabeth. a Bruce. HYSLOP. HTML and CSS: visual quickstart guide. Eight edition. Berkeley, CA: Peachpit Press, 2014. Visual quickstart guide. ISBN 9780321928832.

GUSTAFSON, Aaron a Jeremy KEITH. Adaptive web design: crafting rich experiences with progressive enhancement. Second edition. San Francisco, CA: New Riders, 2016. Voices that matter. ISBN 0134216148.

JOHNSON, Glenn. Programming in HTML5 with JavaScript and CSS3: training guide. Redmond, Wash.: Microsoft, 2013. ISBN 0735674388.

NIEDERST, J. *Web design in a nutshell : a desktop quick reference*. Beijing ; Cambridge: O'Reilly, 2001. ISBN 0-596-00196-7.

Expected date of thesis defence

2016/17 SS – FEM

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Declaration

I declare that I have worked on my Diploma Thesis titled « The Role of Web Design and Web Accessibility in Attracting Customers to the Business» by myself, and I have used only the sources mentioned at the end of the Thesis.

In Prague _____2017

.....

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Acknowledgement

I would like to extend a special thanks to my Thesis Supervisor Ing. Petr Benda, Ph.D. for arousing my interest in the field of Information Technologies, and for his support in creating this Thesis, and I am very thankful to all of my friends and relatives for always encourage and support my ideas.

Summary

The Role of Web Design and Web Accessibility in Attracting Customers to the Business

“The Role of Web Design and Web Accessibility in Attracting Customers to the Business” – the purpose of the given Diploma Thesis is to analyze the benefits of improved Web Accessibility and Web Design not only for the users with special access needs, but also for the organizations. The Thesis is composed of theoretical and practical parts. In theoretical part the essences of both Web Design and Web Accessibility are introduced, their definitions, main elements, and techniques are demonstrated. Last subchapters of theoretical chapters are analyzing the impact of Web Accessibility and Web Design on organizations performances, and how firms can benefit from improved Web Accessibility and Web Design of their websites. The practical part of this paper is devoted mostly to “Click Away Crown Research 2017” and its results interpretation, its background, aims and findings. Click Away Crown 2017 is a research Survey, aimed to investigate the online shopping experience of people with physical impairments in the Czech Republic, and thus, analyze the costs for the organizations of neglected Web Accessibility compliances, and Web Design conformities of commercial web pages. The last chapters of the Thesis “Conclusions” and “Results & Discussions” are devoted to summing up both theoretical and practical chapters and to analyzing the results of the knowledge gained in all chapters of the Thesis.

Keywords

Web Design, Web Accessibility, spending power, disabled people, HTML, CSS, Java Script, PHP, Web Content Accessibility Guidelines, Survey, Business, Click Away

Abbreviations

HTML – Hypertext Markup Language

CSS – Cascading Style Sheets

CAC – Click Away Crown

JS – Java Script

SEO – Search Engine Optimization

ROI – Return on Investment

CSR – Corporate Social Responsibility

MOLSA – Ministry of Labor and Social Affairs

W3C – World Wide web Consortium

WA – Web Accessibility

WAI – Web Accessibility Initiative

WCAG – Web Content Accessibility Guidelines

WD – Web Design

PHP – Hypertext Processor

UI (UX) – User Interface Design (User Experience Design)

UK CAP – United Kingdom Click Away Pound

NPV – Net Present Value

SEO – Search Engine Optimization

e.g. – “for example” ; *i.e.* – “that is”

Souhrn

Role Web Přístupnostupností a Webdesignu v Získávání Nových Zákazníků pro Podniky

"Role Webového Designu a Přístupnosti v Přilákání Zákazníků k Obchodnímu Záměru" - Cílem této diplomové práce je analýza výhod zdokonalení webové přístupnosti a webového designu nejen pro uživatele vyžadující speciální přístup ale také pro organizace. Tato práce se skládá z teoretické a praktické části. V teoretické části jsou představeny klíčové aspekty jak Web Designu a přístupnosti, tak jejich definice, stěžejní prvky a techniky. Poslední podkapitoly teoretické části analyzují dopad webové přístupnosti a webového designu na výkonu firem a jakým způsobem mohou firmy těžit ze zdokonalené webové přístupnosti a webového designu na svých internetových stránkách. Praktická část této práce je z největší části věnovaná výzkumu "Click Away Crown Research 2017", jeho výsledky, pozadí a jeho cíle a poznatky. "Click Away Crown 2017" je průzkum zaměřený na zkušenosti s online nakupováním mezi lidmi s fyzickým postižením v České Republice, tudíž se jedná o analýzu dopadu pro organizace, které zanedbávají dodržování webové přístupnosti a neshody webového designu komerčních stránek. Poslední kapitoly mé práce, konkrétně "Závěry" a "Výsledky a Diskuze" jsou věnovány sečtení obou teoretických a praktických kapitol a analýze výsledků plynoucích z vědomostí získaných ve všech kapitolách této práce.

Klíčová slova:

Web Design, webová přístupnost, Kupní síla, lidé trpící postižením, HTML, CSS, Java Script, PHP, Pokyny v rámci přístupnosti webového obsahu, Výzkum, Obchod, Click Away

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1. Introduction

The number of Internet users is growing rapidly and the cost of access to the Internet is constantly decreasing. It is a common fact, that vast majority of the world population today would rather prefer to use Internet in many aspects of their lives, because of its convenience and approachability. In these circumstances, of course, there is an enormous number of web sites in the web nowadays, and their number is increasing each moment.

The task of the successful web site today, is to predominate among any other web sites in the Internet. Successful web source has to inspire confidence and loyalty to the company, as well as to the quality of its products and services, while maintaining corporate identity, corporate culture, and the company's positioning in the market. If these requirements are met, it is likely, that this company will keep the competitive advantage among its customers. Unfortunately, not all of the potential customers may afford an access to the Internet nowadays, and not because of their financial position, but because of their physical condition, due to aging, or some other permanent or temporary peculiar properties. In this Diploma Thesis not only the importance of accessible web for users with access needs will be demonstrated, but also the impact of Internet these users on the businesses respectively. Web Accessibility, as well, as web optimization, functionality, and design plays vital role in achieving successful results of business activity by gaining more customers and winning their loyalty. The main aim of this Diploma Thesis is to demonstrate, that people with specific access needs have become a large market segment nowadays, and by ignoring Web Accessibility improvement, a lot of companies can loose a vast share of potential customers. Web Accessibility and Web Design are related in this paper due to the fact, that its impossible to achieve Web Accessibility without performing the process of Web Design and development. Both theoretical and practical parts of this Thesis are closely linked, because all the knowledge obtained in theoretical part will be applied in performing the practical part of the Thesis. Main research question of this Diploma Thesis may be consonant with its title: “Does Web Accessibility and Web Design attracts new customers to the business?”

2. Objectives and Methodology

2.1. Objectives

The main objective of this Thesis is to analyze how Web Design and Web Accessibility is influencing the customer attraction of the business. The aim of this paper is to investigate the importance of Web Design and Web Accessibility in terms of business attractiveness. In this Thesis there will be also demonstrated what tools and technologies are used to develop attractive and user-friendly, but at the same time functional and high quality web site to inspire confidence of the customer. There will be explored step by step all of the major components of Web Design, and also there will be analyzed the basic elements of Web Accessibility and its application. The main objective of the Thesis is to show in theory all of the stages, that should be considered in creating a functional and accessible web page. Significant part of this paper is devoted to the research of how disabled people may influence a company performance, by getting broader access to the market through the accessible web.

2.2. Methodology

The methodology of this study is based on analysis and synthesis of technical information resources dealing with selected issues. The importance of Web Accessibility and its development will be analyzed. The essential components of Web Accessibility, its technologies and guidelines are going to be examined in this Thesis. Based on the synthesis of theoretical knowledge and practical results of the findings, there will be conclusions of Thesis formulated. This research is made, by collecting the most recent and valuable data, and by analyzing the materials in the form of evaluation the importance of accessible web for disabled people, as well, as for the businesses. This Thesis is created by processing the given data and by performing the comprehensive assessment of the probable impact of Web Accessibility on online retail businesses. The method of survey conducting will be used, as a research method to analyze the potential impact of Czech Internet users with access needs on the businesses.

3. Web Accessibility

... The term accessibility can be understood to mean accommodating characteristics a person cannot change...

“ Joe Clark

3.1. Introduction to Web Accessibility

There are several definitions of Web Accessibility: *“Content is accessible only if it can be “viewed” or accessed by people with disabilities. Besides getting the information from the page, people with disabilities must be able to use all the functions available to nondisabled users: links, buttons, form controls, and so on. Accessible content must be compatible with assistive technologies, particularly screen readers. There must be alternatives to pure visual content for people who can’t see and alternatives to pure auditory content for people who can’t hear.* (Thatcher, 2006) This definition is relatively brief and abstract, therefore the broader and more meaningful definition is provided below:

“Web Accessibility means that people with disabilities can use the web. More specifically, Web Accessibility means that people with disabilities can perceive, understand, navigate, and interact with the web, and that they can contribute to the web.” (Henry, 2005) This is the most common definition of Web Accessibility, provided by the Web Accessibility Initiative.

As mentioned above, Web Accessibility in the most common understanding means, that web is accessible to the widest audience possible. It is very easy today to surf the web without any inconveniences, to click and point on the things that ordinary users are interested in, or skip the content that is not interesting to them. Unfortunately, people with disabilities are facing the problems in performing this primitive routine every day due to their physical condition. However, it would be a mistake to say, that Web Accessibility concerns only users

with permanent impairments. It may refer also to those people, who face some barriers due to their specific physical needs, even if these needs are temporary, such as a broken finger, or injured eyes for example. Older Internet users also become an important target group and valuable potential customers in different market segments. The main goal of this chapter is to demonstrate, that improved Web Accessibility may be crucial share of success for some businesses, especially for those, who own commercial web sites, online shops, and even for small web presentation of some local businesses. (Ilyas, 2012)

In its broader meaning, Web Accessibility affects mainly users with some kinds of a strong physical disability, but Web Accessibility also benefits people without disabilities. For instance, a core principle of Web Accessibility is designing web sites that are flexible, to meet user's needs, situations and preferences. This flexibility also benefits people without any types of disabilities in certain conditions, such as people using a slow Internet connection, people with "*temporary disabilities*" such as a broken hand, and people with changing abilities due to their aging. (Cunningham, 2012) The Internet has become an increasingly important part of human's life in many aspects: education, commerce, employment, government, health care, recreation, and many others. It is very important, that the web is accessible in order to provide equal access and opportunities to people with different types of disabilities. An accessible web can also help people with disabilities more actively participate in social life.

Web Accessibility embodies all disabilities that may influence access to the web, including visual, auditory, cognitive, and neurological disabilities, physical, speech, and visual impairments. *Auditory disabilities* range from mild or moderate hearing impairments in one or both ears ("hard of hearing"), to substantial and uncorrectable impairment of hearing in both ears ("deafness"). *Cognitive and neurological* disabilities involve disorders of any part of the nervous system, including the brain and the peripheral nervous system. This can impact how well people hear, move, see, speak, and understand information. *Physical disabilities* (sometimes called "motor disabilities") include weakness, limitations of muscular control (such as involuntary movements including tremors, lack of coordination, or paralysis), limitations of sensation, joint problems (such as arthritis), pain that impedes movement, or missing limbs. *Speech disabilities* include difficulty in producing speech that is recognizable

by others or by voice recognition software. For instance, the loudness or clarity of someone's voice might be difficult to understand. *Visual disabilities* range from low vision to complete blindness in one or both eyes ("low vision" or "partial sight"), to substantial and uncorrectable loss of vision in both eyes ("blindness"). Millions of people have disabilities that affect their use of the web. Unfortunately, most web sites and web software currently have accessibility barriers that make it difficult or even impossible for many users with disabilities to use the Internet. As more accessible web sites and software become available, people with physical impairments are able to use and contribute to the web more effectively. (Pemberton, 2006)

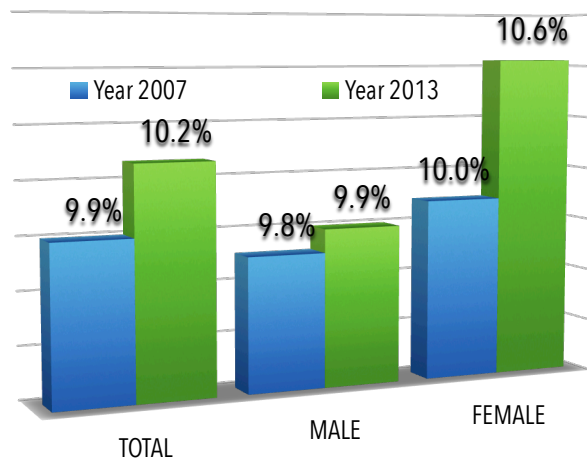
3.1.1. Reasons to Comprise Web Accessibility

There are a lot of benefits for those, who decide to implement improved Web Accessibility to the web site, but some crucial points cannot be ignored. First of all, there might be a legal obligation to provide Web Accessibility in a lot of countries. For instance, in Canada, Web Accessibility is required by "Canadian Human Right Act of 1977", in European Union, there is a relevant document, which is called "Accessibility of Public websites – Accessibility for People with Disabilities: Council Resolution 2002", in Hong Kong its "2001 Hong Kong Digital Strategy", in the United States its "Section 508 – an extension to the American Workforce rehabilitation Act of 1973" etc. There is a growing number of national laws, that consider the availability of Information and Communication technologies and the web. There is also a wide variety of approaches among these laws: some use the approach of creating the human and civil rights of free access to ICT; in other approaches, any ICTs purchased by the government must be available, or that any ICT for sale in a given market should be available; and of course there are a lot of other approaches. (Brewer, 2006)

Second of all, it is ethically and morally correct nowadays, to create a web, that is accessible to the users with all kinds of disabilities, and not to discriminate these users in modern society because of their physical condition. If Web Accessibility of the page is not

high enough, some people would not be able to use it, and this is simply not fair. Moreover, the community of disabled people is not a silent minority anymore. Now they have a right and an opportunity to express their point of view on public, and they are not fond of being discriminated, so if there is a perception that some organization does not support disabled people, the public relations department may suffer largely. Third of all, accessibility may help to win loyalty, trust, and even increase revenues. (Grant, 2008) According to data sourced from Czech Statistical Office, the number of people, living with some type of disability in the Czech Republic was 1,077,673 in the year 2016. The values on the *Figure 3.1.* show, that the share of disabled people in the Czech Republic has increased during the years 2006 till 2013 by 0.3%, while a significantly higher increase revealed among women (0.6 percentage point - from 10.0% to 10.6%), however, for men, the increase of the share is relatively small (by 0.1 percentage points - from 9.8% to 9.9%). (Czech Statistical Office, 2013)

Figure 3.1. The Share of disabled people in the total population of the Czech Republic - comparison of Survey results from 2007 and 2013 years, conducted by CSO



Source 26: Czech Statistical Office 2013

3.1.2. How to Evaluate Web Accessibility

There are several ways of testing Web Accessibility, perhaps, the most popular one is to use some type of Web Accessibility tools, such as *WAVE* accessibility checker, 508 Checker, etc. These tools facilitate the human evaluation by embedding inline accessibility feedback into the web content. Of course, checking Web Accessibility, for Web Content Accessibility Guidelines, or for *Section 508* compliance, using a simple checklist may be very effective way of Web Accessibility testing, but, probably the most time-consuming, and difficult. Some organizations may hire disabled people to test the Web Accessibility of the web page, and of course, this type of secondary testing may be the most precise, and accurate, but might implicate some additional costs. As it was said before, there are a lot of different ways of evaluating Web Accessibility, but a lot of companies may implement several types of Web Accessibility testing, to get the finest results, and to create the web with a highest accessibility level possible. (Thatcher, 2006)

3.2. Introduction to Web Accessibility Initiative

“The Web Accessibility Initiative (WAI) by World Wide web Consortium (W3C) is an effort to improve the accessibility of the World Wide web for people with physical impairments. People with physical disabilities may experience difficulties when using computers or some other devices in general, but also on the web” (Henry, 2006)

The Web Accessibility Initiative was launched in 1997 with support of The White House and W3C members. It has a few working groups and interest groups that work on guidelines, educational materials and other documents that are related to different aspects of Web Accessibility: web content, web browsers and media players, authoring tools, and evaluation tools, etc. For example, The Authoring Tool Accessibility Guidelines Working

Group develops guidelines and supporting resources for tools that create web content, ranging from desktop HTML editors to content management systems. (Muñoz, 2010)

3.2.1. Web Content Accessibility Guidelines (WCAG 2.0)

Web Content Accessibility Guidelines 2.0 offer numerous recommendations aimed to ensure greater accessibility of web content. Implementation of these recommendations will make web content accessible to a wider range of users with disabilities, such as visual impairments (completely blind and visually impaired), hearing impairments (completely deaf and hard of hearing), disorders of the musculoskeletal system, speech disorders, disturbance of the mental plane, and various combinations of multiple and associated disorders. In addition, the implementation of these recommendations will make the web site's content more accessible to users, regardless of the presence or absence of certain physical restrictions. Although the Guidelines take into account a wide range of disabilities and problems, they cannot describe the needs of people with all types, degrees, and combinations of impairments. Compliance with the principles outlined in the Guidelines will makes web content more accessible for seniors as well, whose accessibility needs changes with age, and in some cases facilitate the use of the content of other users. WCAG 2.0 has been developed in accordance with the W3C procedures in close cooperation with institutions and individuals all around the world. The purpose of the document – is the formation of uniform standards of availability of web content that meet the needs of individuals, organizations and governments. WCAG 2.0 is based on a previous version of WCAG 1.0, and is widely used in web technologies that exist in the present, and anticipated in the future, as well as for use in an automated and the availability of manual testing. The main principles of WCAG 2.0 are as follows:

- web must be perceivable;
- web must be understandable;
- web must be usable;
- web must be reliable.

The first principle encompasses the recommendations, that the textual version of all non-textual content must be provided in alternative formats, that are convenient for different categories of users (for example: increased fonts, Braille, scoring, conventional signs or simplified language, etc.), the content must be created in such a way, that can be presented in various forms without loss of information of structure. The second principle assumes, that it has to be possible for all types of users to manage all functionality only with a keyboard. The enough amount of time must be provided to all users to read and work with the content, and all the design elements that are inherently dangerous to health cannot be used. The users must be provided with the assistance and support in navigating, they should be informed about their current positions on the site. The third principle implies, that the text must be easy to read and understandable. The predictability of the behavior of the page must be provided, and users have to be able to avoid the mistakes, or to fix them easily. Reliability principle means, that the maximum compatibility with existing and developed user software, including assistive technologies. Following these core principles in details will ensure the main conformity of Web Accessibility with WCAG 2.0 requirements. (Caldwell, 2008)

3.2.2. WCAG 2.1 Overview

“In 2016, the Web Content Accessibility Guidelines 2.1 First Public Working Draft was released. This draft outlines some new criteria that are built on the existing requirements for WCAG 2.0, and designed to be implemented in harmony with already existing standards of WCAG 2.1. The Web Content Accessibility Guidelines cover a wide range of recommendations for increasing the accessibility of web content.” (Connor, 2017)

Following these recommendations, content will become more accessible to a wider range of people with physical impairments, including blindness and poor vision, deafness and hearing loss, learning difficulties, cognitive limitations, limited movement, speech impairment, photosensitivity and combination of these disabilities. These recommendations

concern the accessibility of web content on desktops, laptops, tablets and mobile devices. For example, the following several additional requirements were added to the WCAG 2.1: *Support Personalization* assumes a set of cognitive attributes and ways to simplify User Interfaces. *Resize content* requires increased zoom up to 400% without scrolling by browser zoom. *Linearization* assumes that webpage is required to reflow to a single column by a browser plugin, or by responsive design. Users mainly with low vision, cognitive disabilities and tunnel vision, who need personalized or simplified interface, and largely zoomed pages benefit from these types of criteria the most. (Connor, 2017)

3.3. Benefits Estimation of Web Accessibility Improvement

This chapter encompasses the benefits and costs of creating accessible web pages, with focusing on access for users with access needs.

3.3.1. Financial Factors in Improving Web Accessibility

To quantitatively estimate the financial benefits of Web Design and Web Accessibility improvements for commercial web sites, the general tools of cost-benefit analysis may be used, such as: *Payback Period*, *Present and Future Value Cash Flows*, *Net Present Value*, and *Internal Rate of Return*, etc. Here is an example of simple Payback Period evaluation for the company:

A project for Web Design and Web Accessibility improvement of the company's website requires an initial outlay of 120,000 CZK, and net cash inflows for the project in the first 3 years are 188,000 CZK, 244,000 CZK, and 368,000 CZK, respectively. Should this project be selected for investment purposes?

Solution: According to the payback method, the answer is yes, because the sum of the net income for the first 3 years is greater than the initial investment outlay: 188,000 CZK + 244,000 CZK + 368,000 CZK > 120,000 CZK

Another, more sophisticated selection techniques are shown in the examples below. Randolph Bias, in his book “Cost-Justifying Usability”, stated the following: *“Time-adjusted cash flow selection techniques are based on the idea that money has a time value and that, by calculating the present value of future cash inflows from a project, including an acceptable rate of return, and specifying the time period in which the cash returns are received, better investment decisions can be made... Net present value (NPV) is a sophisticated selection technique. NPV is the present value of the benefits (inflows) from a project minus the present value of the project cost (outflows)... When competing projects are of unequal sizes, compare them by means of a profitability index. The profitability index (PI) is simply another way of stating the relationship between the present value of project inflows and outflows... The most popular sophisticated analysis technique is the internal rate of return (IRR). IRR is closely related to NPV. IRR is the actual rate of return that an investment in a project will bring if cash inflows and outflows are as projected. Organizations set a minimum rate of return that investment in the project must achieve to be considered acceptable. If the IRR is greater or equal to the minimum return rate, the proposal may be accepted. Otherwise, the investment proposal should be rejected...”* (Randolph, 2005) The examples IRR, NPV (and PV) and PI of the projects are shown in the same book as well:

Lets assume, that the projected cash flows from a project are 188,000 CZK, 244,000 CZK and 368,000 CZK as in previous example, for years 1,2 and 3 respectively, and discount rate is 12%, what is a Present Value of projected benefits?

$$PV = F_1 (1/(1 + i))^1 + F_2 (1/(1 + i))^2 + \dots + F_n (1/(1 + i))^n$$

$$F^1 = 188,000 \text{ CZK}$$

$$F^2 = 244,000 \text{ CZK}$$

$$F^3 = 368,000 \text{ CZK}$$

$$i = 12\%$$

$$n = 3$$

$$PV = 188,000 (1/1+0.12)^1 + 244,000 (1/1+0.12)^2 + 368,000 (1/1+0.12)^3 = 188,000 (0.8928) + 244,000 (0.7971) + 368,000 (0.7117) = 167,846 + 194,492 + 261,905 = 624,243 \text{ CZK}$$

The formula for Net Present Value Calculation is as follows:

$$NPV = F_1 (1/(1+i))^1 + F_2 (1/(1+i))^2 + \dots + F_n (1/(1+i))^n - C$$

In the previous example, the present value of the project's projected inflows for the first 3 years was 624,243 CZK. If the present value of the project's cost (outflows) is 120,000 CZK, should the project be accepted for investment? *Answer:* Yes, because the NPV is positive.

$$NPV = 167,846 + 194,492 + 261,905 - 120,000 = 624,243 \text{ CZK} - 120,000 \text{ CZK} = 504,243 \text{ CZK}$$

Profitability index is calculated as follows:

$$PI = \text{Present value of project inflows} / \text{Present value of project outflows}$$

$$PI = 624,243 / 120,000 = 5.2$$

Since the profitability index of the project is higher than 1 (breakeven), its attractiveness may be considered as very high, so the answer is "yes" – the project should be accepted. Unfortunately, it is not actually relevant to calculate IRR with such a high NPV, due to the fact, that the discount rate taken must be "supernaturally" high. (Randolph, 2005)

3.3.2. Main Benefits of Web Accessibility Improvement for the Companies

Accessible websites can be used by more people, including older people, users who are not fluent in the language, people using different devices for accessing the web, and people with disabilities as well. There are several financial factors that justify the reasons to improve Web Accessibility:

- *Increases potential use by more people, expands potential market share;*
- *Increases potential use in more situations;*
- *Increases usability;*
- *Increases positive image;*
- *Increases direct cost savings;*
- *Decreases potential for high legal expenses.* (Henry, 2012)

Web Accessibility provides an opportunity for the businesses to increase their positive image among the users, and this can also increase the number of visitors to the web page. It is morally and legally correctly to support people with special needs in all aspects, therefore, the Corporate Social Responsibility of the company start to progress. *“CSR - is the concept, according to which organizations take into account the interests of society, assuming responsibility for the impact on their activities. CSR is increasing reputation, brand image and loyalty, enhance ability to attract better employees, and thus increasing financial performance, sales, productivity and revenues”.* (Crowther, 2008)

In recent years, older people became an important potential market for many companies, due to the fact, that life expectancy in many countries has increased during the last years and older people became generally a large percentage of web users. In addition, accessible web pages are more likely to be used by people with permanent and temporary

impairments, caused by any reasons. Older Internet users and people with special access needs are likely to be loyal consumers of the products and services, provided by the webpages, that work properly for them. Furthermore, so called “viral marketing” can work splendidly among these groups of people.

Web Accessibility also increasing the use of the web by people, who works with different devices, and makes it possible for users to access the web in different conditions, e.g.: poor Internet signal, inappropriate environment, usage of a faulty device, etc. All these factors are increasing the usability of the website by more people, hence, expands the potential market share for the business. (Arch, 2008)

Web Accessibility increases SEO findability of the webpage by revealing its content to the search engines. After all, search engines in some meaning are “blind”, just like some impaired people, thus, Google crawlers are not able to see the images, videos or some other content in the Internet. The web crawlers are interpreting and process only “readable” content. In WCAG 2.0 there is a variety of criteria which help to improve SEO of the web page along with developing its accessibility.

On the *Figure 3.2.* below, the categorization of reasons is showing, in relation to who benefits from Web Accessibility, and what type of benefits do they obtain. For the users, the benefits they receive from accessible websites are obvious: they are more efficient, effective, and successful in what they intend to do, and this determines how much they are satisfied by the usability.

For the companies, that developing an accessible product the benefits are as follows: Web Accessibility increases sales, decreases costs, a well as lowers risks and all of these indicators are financially quantifiable to some degree. The benefits, that are not quantifiable, are labeled in the Table as “karma”, i.e. positive market perception and satisfied society, etc. (Bias & Mayhew, 2005)

Figure 3.2. Reasons for Accessibility and The Types of Benefits Each Provides

	Who benefits and Type of Benefit Provided					
	User	Developer/Business			Society	
Reason for Accessibility	<i>Effectiveness, Efficiency, Satisfaction</i>	<i>Increased Sales</i>	<i>Reduce d Costs</i>	<i>Lower Risks</i>	<i>Positive Karma (Social ROI)</i>	<i>Public Health, Welfare, Justice, Employment</i>
<i>Enablement</i>	yes				yes	yes
<i>Accessibility helps everyone</i>	yes	yes				yes
<i>Public good and corporate citizenship</i>					yes	yes
<i>Social justice</i>					yes	yes
<i>Market size</i>		yes				
<i>Niche markets</i>		yes		yes	yes	yes
<i>Positive market perception</i>					yes	
<i>Legal requirements</i>			yes	yes		yes
<i>Cost savings in service provision</i>			yes			
<i>CS in software development&maintenance</i>			yes			

Source 2: BIAS, Randolph & Mayhew Deborah. Cost-Justifying Usability. 2005

3.3.3. Estimating Direct Costs Savings after Accessibility Improvement

In addition to all of the advantages, listed in previous section, the companies are experiencing direct costs savings after improvement of Web Accessibility on their webpages. All of the benefits, gained from improved Web Accessibility result in direct cost savings respectively. With the help of advanced Web Accessibility of the website, the personnel costs

for website maintaining are decreasing significantly. If Web Accessibility is implemented to the website, there is no necessity to upgrade it for new technologies, because accessible web page is already prepared for further web technologies. The other advantage of Web Accessibility in terms of costs savings is a decreased server capacity needed, due to the fact that it saves and additional server costs, because accessibility reduces server overload. In addition, advanced Web Accessibility allows the content to be used with different devices, so there is no need to create a multiple versions of the website. In case of accessible website, there is no risk of potential high legal expenses, because accessible webpage is already compliant with all the accessibility requirements. Another notional benefits of Web Accessibility are decreased costs for alternative formats materials, reduced personnel costs, and many others. (Henry, 2012) The list of direct costs savings, provided by Web Accessibility Initiative is shown below:

- Decreases personnel costs for maintaining the site
- Decreases the amount of server capacity needed and saves on additional server costs
- Decreases the need for creating multiple versions of a site for different devices
- Decreases the cost of upgrading for new technologies
- Decreases potential for high legal expenses
- Decreases cost of alternative format materials
- Decreases cost of translating
- Decreases personnel costs (*Henry, 2012*)

4. Web Design

...Content precedes design. Design in the absence of content is not design, it's decoration...

“ Jeffrey Zeldman

4.1. Defining Web Design

In its broader meaning, website design means planning, creation and maintenance of websites. Web Design also includes website structuring, user interface experience design, information architecture, navigation ergonomics, creating website layouts, fonts, imagery and colors, etc. Web Design is a part of web development that aims to design user web interfaces for websites or web applications. Web Designers also create the logical structure of web pages, think through the most convenient solutions for submitting information, and also engage in the visual design of the web project. (Leavitt, 2001) More specifically, Web Design encompasses many different skills and disciplines in the production and maintenance of websites. The different areas of Web Design include web interface design; graphic design; authoring, including standardized code and proprietary software; user experience design and search engine optimization. Often many individuals will work in teams covering different aspects of the design process, although some designers will cover them all. (Niederst, 2001) *“There are two main standpoints from which most people determine whether a website design is “good” or “bad.” There’s a strict usability angle, which focuses on functionality, the effective presentation of information, and efficiency. Then there’s the purely aesthetic perspective, which is all about the artistic value and visual appeal of the design. Some people become caught up in the aesthetics and graphics, and forget about the user, while some usability gurus get lost in their user testing and forget about visual appeal. In order to reach people and retain their interest, it’s essential to maximize both”*. (Beaird, 2010)

4.1.1. Web Design Milestones

“The process of designing a website falls somewhere between bridge building and sculpture. The goal of Web Designer is to create a functional site that’s aesthetically pleasing, but the highest priority should be to meet the needs of the users. Due to this purpose, the process of website creation usually consists of the clear structure: terms of reference stage, structuring of information, graphic design, actual development and so called web mastering”. (Beaird, 2010). The main stages in Web Design process may be divided into following groups:

Terms of Reference (TOR) – Based on a clear understanding of the purpose for which the site is being created, the volume of the site, its functionality, the main parameters of the visual representation and structure of the site are set. The stage ends after the approval of the technical assignment by the customer. *Structuring of information (usability and wireframe)* – This includes the form and organization of the content of the site. Includes a wide range of questions from thinking through the logical structure of web pages to selecting the most convenient forms of information delivery.

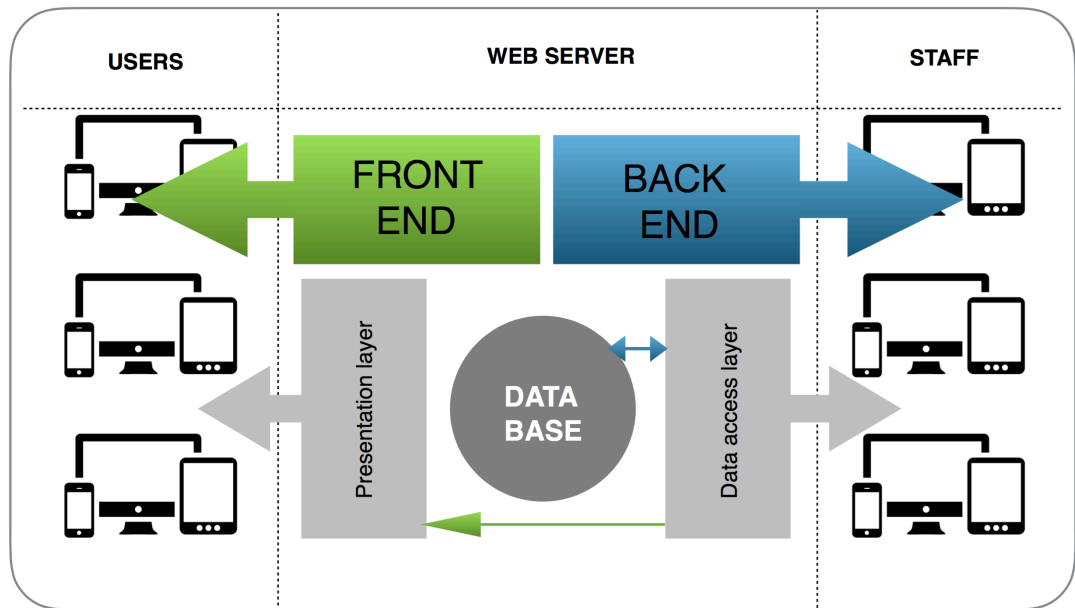
Graphic design and layout – In the graphical editor, the visual space of the site is compiled with the help of graphic elements as decoration or navigation. The actual design of the web site is a graphic file that reflects the visual representation of the future web page. *Web development* – At this stage, the graphic picture is cut into separate elements and using HTML and CSS technologies is transformed into code that can be viewed using a browser. On this stage, the process of programming is actually aimed to transfer the visual image of the web page into a real website that retains its functions, obtains interactivity, and remains the conceived Web Design. *Web mastering* – At this stage, actions are taken to facilitate the distribution and effective delivery of the site through the network. Includes hosted hosting and search engine optimization. This stage might be also called maintenance of the web page, since the main concept of this stage is to preserve the functionality of the site, to expand its use among users, to rise findability of the page in the network, to preserve its original

qualities, and eventually add new additions and improvements to ensure that users do not stop visiting the web page. (Beaird, 2010)

4.1.2. Frontend and Backend Architecture

The process of website development usually consists of two main components: the front-end development, and back-end development. The concept of Front-end includes a whole layer of languages and technologies that are used to make the page open and visible in the browser and to behave as it was intended to behave. In particular, this includes mainly HTML, CSS, and Java Script usage. Backend development is the process of programming a site and filling it with functionality, creation of the site's core, development of the site's functional platform, filling it with the main functionality and creating an administrative zone, etc. The frontend is basically everything related to what the user sees on the screen, including design and some languages, such as HTML, CSS and Java Script, etc. The front-end development can be performed, without any background of back-end development. Sites that are created with the use of just front-end development, without using a back-end, are called static sites. A static site may be created for a simple web presentation of a restaurant or a hairdresser shop for example. This does not require any information to be stored in the database. Pages almost always remain unchanged, excluding a visual redesign of a website. (Godbolt, 2015) Back-end, or "server-side" development, indicates basically, how the site works, updates and changes. This applies to everything that the user cannot see in the browser, for example, the databases and servers. Back-end development is implemented to create a dynamic site that is constantly updated in real time. A dynamic site requires that the database work properly, and all the information, such as user profiles or images that they downloaded, or blog posts, are stored in the database. On the *Figure 4.1.* the interaction with database shown. For these purposes, the beck-end development usually implicates the use of such languages as PHP, Python, Ruby, etc. (Salvi, 2017)

Figure 4.1. Schematic demonstration of simplified linking back-end and front-end developments



Source: Author 2017

4.1.3. Technologies for Structure, Presentation, Behaviors and Functionality

There are three basic building blocks of the web: HTML, CSS, and JavaScript. HTML stands for Hypertext Markup Language, and it is the most widely used language to write web Pages. Hypertext refers to the way in which web pages (HTML documents) are linked together. Thus, the link available on a webpage is called Hypertext. As its name suggests, HTML is a Markup Language which means that HTML is used to simply "mark-up" a text document with tags that tell a web browser how to structure it to display. Cascading Style Sheets, fondly referred to as CSS, is a simple design language intended to simplify the process of making web pages presentable. CSS handles the look and feel part of a web page. Using CSS, it is possible to control, how the colors of the text, the style of fonts, the spacing between

paragraphs, how columns are sized and laid out, what background images or colors are used, as well as a variety of other effects. Most commonly, CSS is combined with the markup languages HTML or XHTML. JavaScript is a dynamic computer programming language, that is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities. (Ali, 2014) These three programming languages are the core instruments for creating a fine, static web sites, however, as it was said before in this chapter, with the help of just these three languages its impossible to create a sophisticated functional website, which can be called dynamic.

4.1.3.1. HTML5 for Structuring

HTML5 - is the fifth and current version of the Hypertext Markup Language standard that is used to structure and present content on the World Wide web. The guidelines for making web content accessible for people with disabilities (WCAG 2.0) have been developed in such a way, that they can be implemented while using HTML for creating an accessible web pages. These guidelines describe methods for creating accessible content with hypertext markup language, and other programming languages, used to create a web. Web Content Accessibility Guidelines are intended to help authors of web content, who want to declare compliance with the WCAG 2.0 requirements. (Connor, 2012)

For example, in the First Principle of Web Content Accessibility Guidelines 2.0, which declares that “web content must be Perceivable” it is stated, that the author of the web page should “*Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.*” (Caldwell, 2008) The simple example below shows, how this can be implemented on practice:

Figure 4.2. Own code example of alternative text in HTML document

```
<!DOCTYPE html>
<html>

<head>
  <title>Alt Text Example</title>
</head>

<body>

  <h1>Picture of PEF Faculty</h1>

  <img alt= "The red building of CULS' Faculty of Economics
and Management is shown on the picture. A big green Bonsai tree is
growing on the foreground, just in front of the entrance to the
building. The weather is sunny, and the building looks beautiful!"
      src= "http://m.sumperk.cz/galerie/642013_623_322.jpg" >

  <p>2017_ChristineS.</p>

</body>
</html>
```



Source: Author 2017

4.1.3.2. CSS for Presenting

In WCAG 2.0 there is a list of techniques that can be used as a recommendations of how CSS may enhance visual appearance of the website, so that it will maintain an expressive and accessible presentation when the CSS is not applied by some users. With the help of CSS it is possible to separate the styling of the website from its content, and this is crucial for some users, who has to unable the disturbing styles, otherwise it is impossible for them to use the web efficiently, and perceive just the most important content of the webpage and navigate it successfully. Different users are accessing the web with the help of different devices, so the

visual appearance of the webpage not necessarily has to be the same for everyone, but the content of the page must be the same every time and for each user. For instance, the users with special needs who suffer from low vision have to create a special fonts with a particular contrasts and of different styles, and redirect the content to present the information in the form, that is convenient and perceivable for these users. (Castro, 2014) The aim of separating style sheets from the content was set by some degree in order to achieve the aim of enabling the same content to be served for different devices — not only desktop computers. “For example, the “media” attribute specifies the output device that is intended for use with the document, for example: media=”screen”. This attribute has increasing impact as more people access the Internet in different ways” (Ducket, 2005) Here are the possible values:

Figure 4.3 List of possible values for media attribute and their description

Value	Uses
screen	Computer screens (typically, these will scroll and will not have pages in the same way that a book or magazine has a fixed page size)
tty	Media that display fixed-width characters, such as teletypes, terminals, or portable devices with limited display capabilities
tv	TV devices with color screens that are lower resolution than computer monitors and which have limited ability to scroll down pages
print	Printed matter that displays documents in pages of fixed size (such as books and magazines) and for documents shown on a screen in print preview mode
projection	Projectors
handheld	Handheld devices, small screens, bitmapped graphics, and limited bandwidth
braille	Braille tactile feedback devices
embossed	Braille page printers
aural	Speech synthesizers
all	Suitable for all devices

Source 6: DUCKET, Jon. *Accessible XHTML and CSS web Sites*. 2005

4.1.3.3. JavaScript for Interactivity

“JavaScript is a programming language that aimed to add interactivity to custom behaviors to the web pages. It is a client-side scripting language, and it runs on the user’s machine and not on the servers, as some of the other programming languages, such as PHP or Ruby, etc. Therefore JavaScript, which is also known as a dynamic and loosely typed programming language, is reliant on the browser’s capabilities and settings.” (Robbins, 2012)

As it was mentioned before in this Thesis, the “structural layer” of a web page is HTML, and the “presentational layer” is CSS, but the “behavioral” layer of the web page can be made up by using the JavaScript programming language. Several years ago, it was recommended, that applications should better work without JavaScript usage, because it was misunderstood in some meaning, but in many instances the problem is not in actual usage of JavaScript, but in the fact, that some developers do not use it properly. (Johnson, 2013) One of the most frequently encountered problems with JavaScript when it comes to accessibility is the use of mouse events only for a given functionality. For example, an action takes place when you hover over a page element. This itself is not a problem. The problem occurs if a keyboard equivalent for those who cannot use the mouse is not created. If the same functionality can be achieved by both using the mouse and the keyboard, this part of the JavaScript application is considered to be accessible. Today, assistive technologies can handle JavaScript very well. In fact, it can be a very useful tool, when it comes to dynamic content update, or error handling for example when used in an accessible way. If JavaScript is used properly, than a lot of functionalities will enhance the browsing experience to people with disabilities as well. (Robbins, 2012)



Figure 4.4. HTML5, CSS3 and JavaScript official logos
Source 33: planet-source-code.com 2017

4.1.3.4. PHP for Dynamics

PHP originally stood for Personal Home Page, but now it stands for Hypertext Processor, which is a server-side scripting language created for web development, and is used as a programming language for general-purpose. PHP code is an HTML embeddable server-side scripting language, or it can be used in combination with various web content management systems, web template systems or web frameworks. This scripting language allows developers to create a dynamic web page contents.

PHP can also collect form data, add, delete, encrypt or modify data in database, it can send and receive cookies, and even create, write, read and open or close files on the server. Due to the fact, that PHP often serves to create different log- in systems, it makes filling in the forms possible, as well as survey submitting, and many other dynamic processes, it is closely related to database systems, such as MySQL to store, maintain, and manipulate the data on the database.

The combination of PHP and MySQL is the most convenient approach to a dynamic, database-based Web Design that is held in hand before the challenges of integrated infrastructures. (Nixon, 2015)

4.2. Web Usability

Understanding the needs, desires and limitations of users is key to the success of a website design or web application. This approach to designing around the needs of the user is called the User-centric Center (UCD), and it occupies a central place in modern design. Website design often begins with user research, including interviews and observations, to better understand how the site can solve problems or how it will be used. For designers, it is

typical to conduct a round of custom tests at each stage of the design process to ensure the convenience of their design. If users do not easily understand where to find content or how to proceed to the next step in the process, it will return to the drawing board.

Some of the broad purposes of usability are the presentation of information and choice in a clear and concise manner, the absence of ambiguity and the placement of important items in relevant fields. Another important element of ease of use on the Internet is that the content runs on different devices and browsers. Another problem with usability is that the website is suitable for all ages and genders. (Robbins, 2012)

4.2.1. User Experience Design (UX)

The goal of the interaction designer is to make the site as simple, efficient and enjoyable as possible. Closely related to the design of interaction, the design of the user interface, which is usually more narrowly focused on the functional organization of the page, as well as on specific tools (buttons, links, menus, etc.) that users use to navigate content or perform tasks. The more recent name of the work in the field of Web Design is the User Experience Designer. Designer UX adheres to a more holistic approach, since all experience with the site is favorable.

The UX design is based on a deep understanding of users and their needs based on observations and interviews. According to Donald Norman (who coined the term), the design of user experience includes "all aspects of user interaction with the product: how it is perceived, recognized and used." For a website or application that includes visual design, user interface, quality and message content and even overall site performance. This experience should correspond to the brand and business goals of the organization in order to be successful. (Tidwell, 2011)

4.2.2. User Interface Design (UI)

Designing a user interface (UI) means to develop the user interfaces for different devices with focusing on the feature, that the interface of each application, program, or web presentation, etc. will retain the high usability and easy navigation for the users. User-oriented design is aimed to serve in such a way, that user is obtaining the highest level of productivity from interaction with the interface.

A good design of the user interface makes it easy to complete the task at hand without attracting unnecessary attention to yourself. Graphic design and typography are used to maintain its usability, influencing how the user performs certain interactions and improves the aesthetic appeal of the design; Aesthetics of design can enhance or detract from the ability of users to use interface functions. The design process must balance technical functionality and visual elements (for example, a mental model) to create a system that is not only workable, but also suitable for use and adapted to the changing needs of users. The interface design is involved in a wide range of projects from computer systems, to cars, commercial aircraft; All these projects are largely related to the same basic human interaction, but also require some unique skills and knowledge. As a result, designers tend to specialize in certain types of projects and have skills focused on their experience, whether it's software development, user research, Web Design or industrial design. (Cao, 2017)

4.2.3. Responsive Web Design

In modern society people start to use mobile devices more and more often instead of using their desktop computers. The advantage of responsive website, is that the information from this site may be perceived by the visitor with no regard to where and when this visitor is located, or what the one is doing. *“Responsive Web Design is a series of techniques and*

technologies that are combined to make delivering a single application across a range of devices as practical as possible”. (Sharkie & Fisher, 2013)

Responsive Web Design is the concept, which indicates that Web Design and web development should adapt to the user’s device, based on it’s screen sizes, on the platforms or various technologies, as well as scree orientation that user applies while using the device. (Gustafson, 2016) *“The practice consists of a mix of flexible grids and layouts, images and an intelligent use of CSS media queries. As the user switches from their laptop to iPad, the website should automatically switch to accommodate for resolution, image size and scripting abilities. In other words, the website should have the technology to automatically respond to the user’s preferences. This would eliminate the need for a different design and development phase for each new gadget on the market”* (Smashing, 2011)

4.3. Impact of Web Design on Company’s Performance

“Making computer-based products (and services) more usable is smart business. Usability increases customer satisfaction and productivity, leads to customer trust and loyalty, and contributes to tangible cost savings and profitability. User interface development is part of a product’s development cost anyway, and it pays to do it right” (Bias & Mayhew, 2005)

4.3.1. Benefits of Web Design Improvements on Branding

In modern society people start to use mobile devices more and more often instead of using their desktop computers. The advantage of responsive website, is that the information from this site may be perceived by the visitor with no regard to where and when this visitor is

located, or what the one is doing. *“Responsive Web Design is a series of techniques and technologies that are combined to make delivering a single application across a range of devices as practical as possible”*. (Sharkie & Fisher, 2013). From SEO, branding and loyalty, to conversion rates, increased traffic and more, the site’s Web Design plays a major role in how the brand is perceived by the website visitors and potential consumers. This chapter examines how properly designed web sites support e-branding as well as convey product information to potential customers as a substitute for buyers' own information gathering activities. *“Websites are powerful tool for building brands. A well-designed site facilitates branding, but poorly designed web site can destroy a brand. There are three stages overlap rather than being distinct. In each stage, user requirements concerning functionality and web interfaces are unique. During brand building, the Web Design should be dynamic. Since Web Design significantly affects all three stages of e-branding in different ways, the following subsection describe the basic consideration of Web Design for each stage.”* (Cook, 2003)

4.3.2. Web Design impact on SEO and Conversion Rates

Design trends are constantly changing, therefore, the brand of the firm and online presence of the company should adjust to these never ending changes. The most important thing for the commercial website, along with its branding perception of the users is advanced SEO and increased traffic. Without appliance with traditional Web Design structures, that search engines use to crawl, the findability of the website and its traffic goes down. Responsive Web Design is also a key to successful optimization, as far as search engines are used to reward web pages that investing in improving responsiveness. Starting from the HTML structure and finishing with website appearance, Web Design always has a potential to affect the search ranking of the web page. In addition, it is important to understand, that Web Design may influence the conversion rates of the company. It is obvious, how navigation and usability is related to the conversion rates. The websites, which present some kind of

challenges for users no navigate, will be most probably considered as unattractive, and the users will lose the interest in this web page. Wording and navigation undoubtedly serve as the “call-to-action” elements of the website. Colors are on of the most important participants in building “attractive” websites. There is a necessity to distinguish when its time to use big and red texts, or “calm navy” to evoke the trust in users minds. It is important to understand the vital role of Web Design in attracting customers: from SEO, branding and loyalty, to conversion rates and more, the site’s Web Design plays a major role in how the brand is perceived by the website visitors and potential consumers. (Hendricks, 2015)

5. Practical Part

...I have to say that topic of your Diploma Thesis is very interesting, especially in the time when the EU adopted the directive on Web Accessibility standards and launched the draft of the European Accessibility Act... Regarding your questions we should inform you that in the the Czech Republic there is no even a single or unified statistical database about situation of persons with disabilities. There is no even any homogenous definition of persons with disabilities here. That is the reason why the Ministry of Labor and Social Affairs couldn't give you any specific information on persons with disabilities ...

“JUDr. Štefan Čulík, head of the Council Secretariat of MOLSA in the Czech Republic

5.1. Czech “Click Away Crown 2016” Project Background

After unsuccessful attempts to find relevant and recent statistical data regarding the Internet use by disabled people in the Czech Republic, the *United Kingdom Click Away Pound 2016 Research (UK CAP2016)* was discovered, and served as a motivational study for conducting similar research in the Czech Republic. Due to the fact, that there is no statistical data concerning how disabled people in the Czech Republic use the Internet, and what are the conditions of these people regarding online shopping, the decision on conducting Click Away Crown Survey has been made in order to get more data regarding how disabled people in the Czech Republic use the Internet. From economic perspective, the aim of this research is to examine the potential online spending power of disabled people in the Czech Republic, and to analyze the potential disadvantages for the businesses in case of non-conformity of the web pages with Web Accessibility requirements and guidelines.

5.1.1. United Kingdom “Click Away Pound 2016” Project Overview

“Click-Away Pound is a research survey designed to explore the online shopping experience of people with disabilities.” (CAP Report, 2016) In today's world of democracy, loyalty, and tolerance it is a common feature that all information, goods and services have to be both available and accessible for all the people around the world. In the era of rapid information technologies development, and market economy, most people are able to get a lot of knowledge, information, and material goods without even leaving their own house. It is a common sense that online shops should be opened for everyone, but what if there is a person, who cannot use a computer mouse, see the screen of the notebook, or hear the sound of the video commercial? The Research is designed to examine how often do people with disabilities shop online, how much do they spend online and for what purposes, what types of accessibility barriers do they face, and how do they behave, when facing an inaccessible web page. The Click Away Pound report says, that there are 11 million people with a limiting illnesses, some kind of disabilities or impairments in the United Kingdom, who should benefit the most from the online retail businesses, and from the Internet access generally. The results of the Click Away Pound shows that there is ignoring to provide the customers with accessible web pages, cost United Kingdom retailers £ 11.75 billion in the year 2016. The next report of the UK Click Away Pound Survey will be published in 2018 and will show the next tendencies of disabled people in UK regarding the Internet usage, and online shopping. (Williams & Brownlow 2016)

5.1.2. “Click Away Pound 2016” Survey Findings

The predecessor of “Click Away Pound Research” is a so-called Purple Pound movement, which is devoted to estimation of disabled people spending power as a group. The

findings of the Purple Pound researches resulting in following: “UK’s 11.9 million disabled people are said to have disposable income collectively worth £80bn. Campaign groups regularly cite this figure and find it useful to remind businesses and politicians that disabled people are a sizeable economic force and should not be forgotten”. (Ouchlets, 2014)

The aims of the survey may be divided into two parts: main goals, and secondary goals. The secondary aim of the research is to gather the general statistical information of disabled people in United Kingdom: their age and geographical location, type of disabilities that they experience, devices that they use for online shopping most often, market sectors in which they usually shop, their average incomes and spending by month, what type of barriers they are facing while online shopping processes, their reaction to an inaccessible web pages, and potential behaviors, if the web sites were more accessible. Survey findings showed, that the potential redirect spending because of inaccessible web pages is equal to £ 11.75 billion in the year 2016.

Figure 5.1. UK Internet users with access needs in 2015 (3)

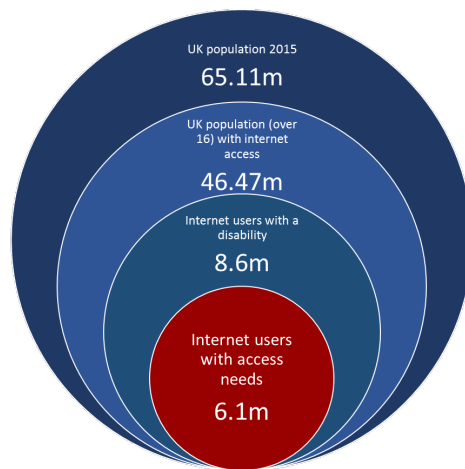
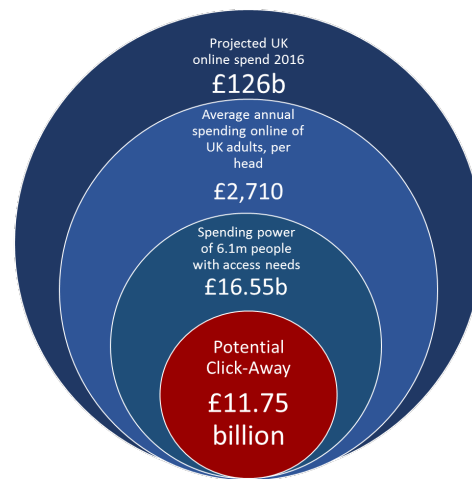


Figure 5.2. Potential re-redirect spending because of inaccessible websites (3)



Source 3: Click Away Pound Research 2016

The estimate of the United Kingdom population by the Office of National Statistics is 65.11 million people. In 2016, the Office of National Statistics has estimated that there are 8.6

million disabled Internet users in the United Kingdom. The Click Away Pound Survey has found that 71% of Internet users with disabilities have access needs, which translates to 6.1 million people in the UK. *(Figure 5.1)*

Click Away Pound project has calculated total UK online spending to be £ 12610 by the beginning of the year 2016. *(Figure 5.2)* “After calculating the average spending per head to be equal to £ 2710, the online spending power of 6.1 million disabled people in United Kingdom with access needs in 2016 is equal to £ 16.55 billion. The Click Away Pound Survey found that 71% of the total 6.1 million disabled Internet users with access needs in United Kingdom simply click-away when confronted with an inaccessible website. The main finding of the Click Away Pound shows, that a potential Click Away Pound in the UK is equal to £ 11.75 billion lost in 2016 from those web sites that are not accessible for disabled users.” (Williams & Brownlow 2016)

5.2. “Click Away Crown 2017” Project Overview

In order to gather the information of disabled Internet users in the Czech Republic, the Click Away Crown 2017 Survey has been conducted. Unfortunately, there is a lack of statistical data regarding not only the tendencies of Internet use by disabled people in the Czech Republic, but the overall demographic data and the financial state of disabled citizens in the Czech Republic is simply absent or very outdated. The Click Away Crown Survey is aimed to find out how many people in the Czech Republic experience the access needs, what is the demographic situation among these users, what is their projected online spending power and finally, what is the potential amount of Click Away Crown in the Czech Republic.

5.2.1. “Click Away Crown 2017” Survey Methodology

The Click Away Crown Survey was created to collect the overall information about disabled Internet users in the Czech Republic. Due to the fact, that the decent process of Survey distribution implies higher costs for developing and maintaining an accessible web page, and a survey tool itself, as well as participation of institutions that are able to reach a higher amount of disabled people all around the the Czech Republic, the given Click Away Crown Survey was currently completed by 172 participants. The “Google Forms” tool was used to conduct a survey regarding the fact, that this tool is considered to be the most accessible free online Survey tool. On the official page of Google Administrator Guide to accessibility, the following information is provided: *“Blind and low-vision users can use Google Forms to create, send, and respond to forms. Google Forms support screen readers and keyboard shortcuts, etc.”* (Coogle, Inc. 2012) The Click Away Crown Survey is originally conducted in Czech language, because the goal of the research is to collect data from the

citizens of the Czech Republic respectively. In order to spread Click Away Crown Survey among all the regions of the Czech Republic, the Survey was distributed to the official web pages and social media pages of the following Institution:

- “Czech Blind United.cz”
- “Czech Blind United Kladno”
- “The Czech Association of Physically Disabled Athletes”
- “HelpPes – Centre of Training Dogs for Disabled People”
- “Czech Centre for Helping Aids Development for disabled”
- “Union of the Deaf in Brno”
- “Centre for People with Visual Disabilities PALATA”
- “Counseling center for hearing impaired Kroměříž”
- “Czech Association of Deaf Athletes”
- “Pilsen Union of the Deaf”
- “Ostrava Association of the Deaf”
- “Centre for the Handicap Srdce”
- “Czech National Disability Council”
- “Charitable Society for visually impaired and blind people Tyflo Centrum Brno”, and many others.

(However, it is not known exactly, which of these organizations were participating in survey distribution definitely).

The Click Away Crown Survey Consists of 35 questions, that may be divided into three blocks: 1) questions regarding demographical data and types of impairments; 2) questions regarding incomes, online spending power, online spending frequencies and preferable market sectors for online shopping; 3) types of devices used for online shopping, types of accessibility problems, often faced by the users, and projected behavior in case of inaccessible web pages. It should be noted, that the current Click Away Crown Survey contains some limitations: the types of impairment are not considered as a straight point of the research, the types of assistive technologies are also not a subject to investigation, instead, the survey is focused on the areas, where disabled users shop online in most cases, on barriers, that they find on retail websites, how much they spend online, and what disabled customers do, when they visit an inaccessible web page.

This research was developed as a preceded study and probably Official Project Proposal that may become a first step and inspiration for such institutions as Czech Ministry

of Labor and Social Affairs, Czech National Disability Council, and Czech Statistical Office, to create a more extensive Survey in order to get precise information about the disabled Internet users in the Czech Republic, and how they may influence the online retail businesses.

5.2.2. Click Away Crown Results Interpretation

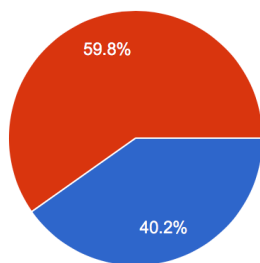


Figure 5.3. Click Away Crown 2017 Logotype

Source: Author 2017

This section analyses the findings of the Click Away Crown Survey in key areas of participant experiences, their online spending power and behaviors during online shopping. As it was mentioned before in this paper, the Survey consists of 35 questions, but in this Chapter only most important charts will be shown to perform the analysis of the findings, crucial for demonstrating the main purpose of the research. Earlier in this Thesis it was mentioned, that the share of women in overall number of disabled people in the Czech Republic is larger, than share of men.

Figure 5.4. Share of Disabled Internet users in the Czech Republic by gender (in percentage)



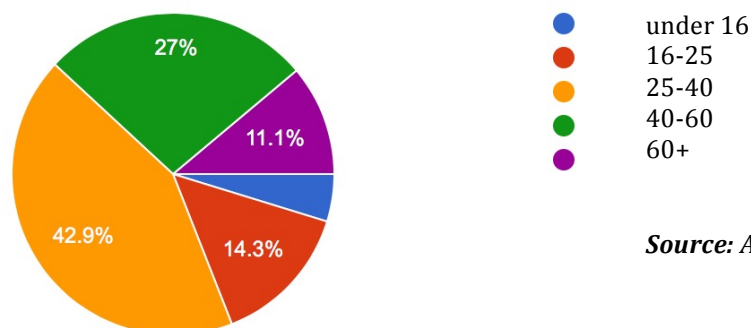
male

female

Source: Author 2017

The Click Away Crown Survey Shows, that the share of woman in overall number of disabled Internet users in the Czech Republic is also larger than the share of man. Among all survey respondents, there were 59.8% of women, and only 40.2% of men (*Figure 5.5*). The next Chart is showing the prevalence of age categories among all Click Away Crown Survey respondents. People aged 25-40 years old are the major group of Survey participants: 42.9% of all respondents. 27% of all participants are aged 40-60 years old, and 14.3% are 16-25 years of age. 11.1% have already reached retirement age, and the rest are under 16 years old.

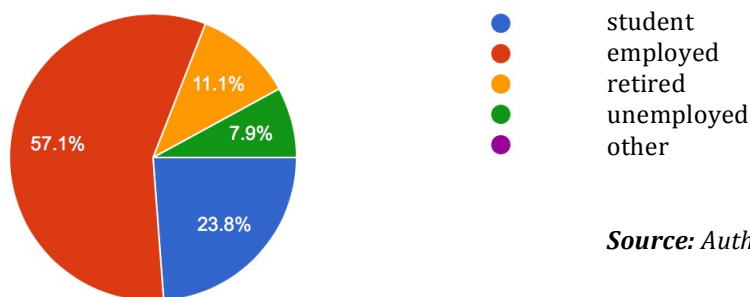
Figure 5.5. Share of Disabled Internet users in the Czech Republic by age (in percentage)



Source: Author 2017

There are 57.1% of employed people among all Click Away Crown Participants, 23.8% of participants are students, 11.1 % of them are retired, and only 7.9% are unemployed:

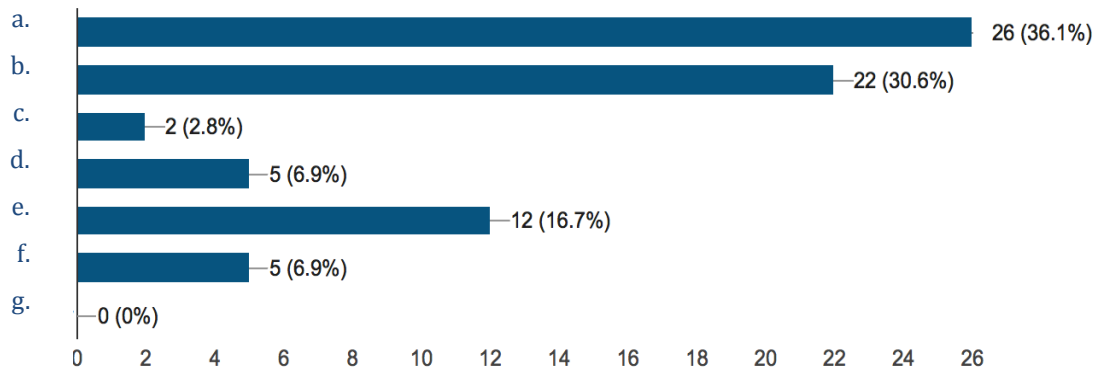
Figure 5.6. Share of Disabled Internet users in the Czech Republic by professional of employment status (in percentage)



Source: Author 2017

The bar chart below deals with the types of impairments among survey respondents, and shows the following results:

Figure 5.7. Share of Disabled Internet users in the Czech Republic by the type of impairment (in percentage)



a. Visual Impairments = 36.1%

b. Hearing Impairments = 30.6%

c. Speech Disorders = 2.8%

d. Mental impairments = 6.9%

Source: Author 2017

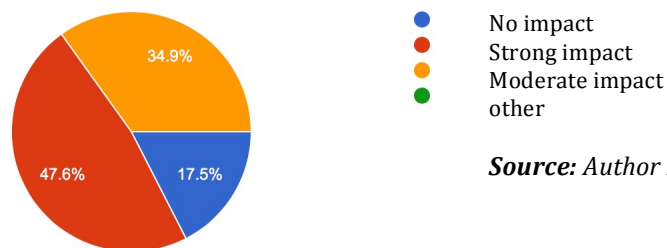
e. Physical impairments = 16.7%

f. Motor impairments = 6.9%

g. Other = 0%

The next pie chart demonstrates, what level of impact does have the impairment on Internet use by the respondents. 47.6% of participants have answered, that their impairments has a strong impact on Internet use. 34.9% stated, that their disability have a moderate impact on how they use Internet, and 17.5% said, that their impairment doesn't have any impact on Internet use. (Figure 5.8.)

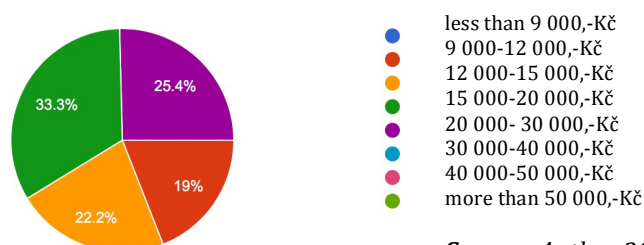
Figure 5.8. The level of Impact on Internet use by disabled people in the Czech Republic (in percentage)



Source: Author 2017

The Click Away Crown Survey also asked participants to quantify their average incomes on a monthly basis. The next pie chart suggests, that there is no significant difference in spending levels between those who has some kind of disability and ordinary Internet users (minimum wage in CR is about 8,950 CZK per month, and average wage is equal to 22,270 CZK per month). 33.3% of all respondents answered, that their average income is 15,000-20,000 CZK per month, while another 25.4% said, that their monthly income is between 20,000-30,000 per month, 22.2% stated, that their income is about 12,000-15,000 CZK per month, and only 19% answered, that they earn 9,000-12,000 CZK on a monthly basis.

Figure 5.9. The level of monthly income among disabled Internet users in the Czech Republic (in percentage)

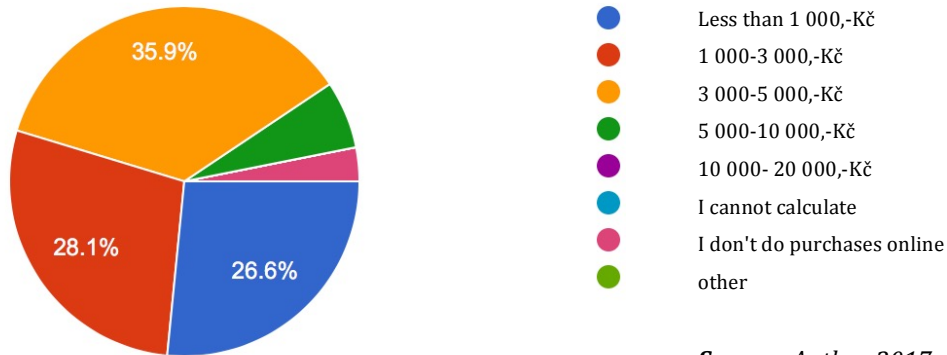


Source: Author 2017

The next pie chart demonstrates, an average online spending of people with disabilities in the Czech Republic. Participants were asked to estimate, how much in average they spend online on a monthly basis, and the results are as follows: 35.9% of respondents are spending 3,000-5,000 CZK per month, 28.1% of respondents spend between 1,000 and 3,000 CZK per month. Another group of 26.6% said, that they spend no more that 1,000 CZK per month in average. (Figure 5.10)

Now it is possible to calculate an approximate overall online spending power of respondents with access needs per one year, on the example of calculations from Click Away Pound report: as it was mentioned in the first Chapter of this Thesis, there are about 1,077,673 disabled people in the Czech Republic, and if approximately 30% of these people are ready to spend up to 5,000 CZK per month, the overall online spending power of disabled people in the Czech Republic is estimated to be about 1.5 billion CZK per month.

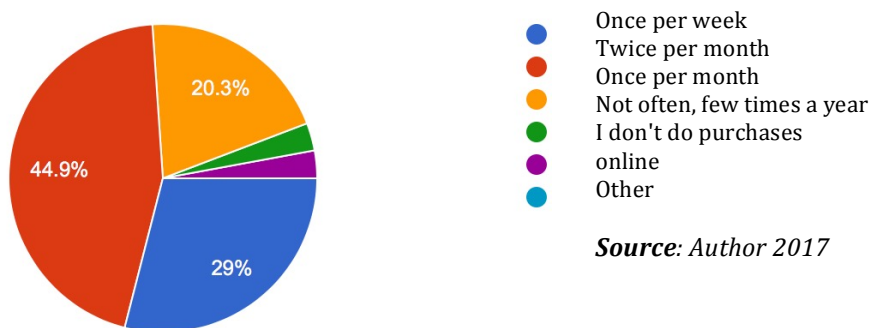
Figure 5.10. The level of monthly online spending among disabled Internet users in the Czech Republic (in percentage)



Source: Author 2017

The survey has also asked respondents how often they use retail websites in average. The chart below shows, that 44.9% of users with access needs stated, that they shop online in average twice per month, 29% - once per week, and 20.3% said, that they shop at least once per month in average. The rest 5.8% answered, that they don't do purchases online, or do this very rare: only few times a year. (Figure 5.11)

Figure 5.11. The frequency of online purchase by users with access needs in the Czech Republic (in percentage)

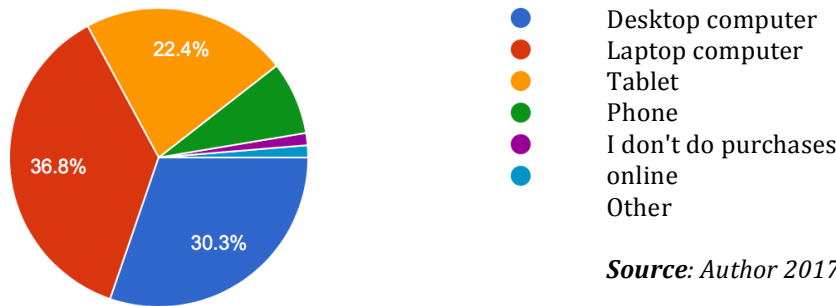


Source: Author 2017

The Click Away Crown Survey sought to establish the hardware context of participants' Internet usage. Regarding this question, the answer were as follows: 30.3% of respondents usually shop online using their desktop computers, 36.8% of participants use

laptops, 22.4% are usually using tablets for online shopping, and 7.9% are using their phones. The rest answered, that they prefer to not purchase online. (Figure 5.12)

Figure 5.12. Type of devices most commonly used for online shopping by users with access needs in the Czech Republic (in percentage)

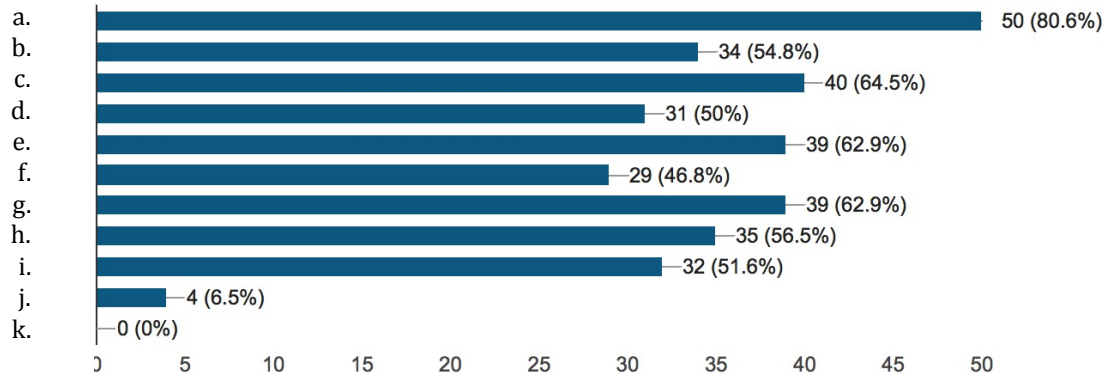


Source: Author 2017

The following bar chart demonstrates the most common website issues, that users with access needs may experience. About 80.6% of the respondents said, that the most common barrier for them is crowded page with too much content, 64.85% feel difficulties with filling in forms on websites, 62.9% stated that there is a poor legibility (color contrast and text layout), and poor link information and navigation, 50% said that they often facing a problem of distracting moving images and graphics. (Figure 5.13)

- | | |
|---|---|
| a. Crowded pages with too much content | f. Graphical “captcha” |
| b. Poor link information and navigation | g. Inconsistent page layout and design |
| c. Filling in forms | h. Limited or no support for browser accessibility features |
| d. Distracting moving images and graphics | i. Pop ups, adverts and banners |
| e. Poor legibility (color contrast and text layout) | j. I don’t do purchases online |
| | k. Other |

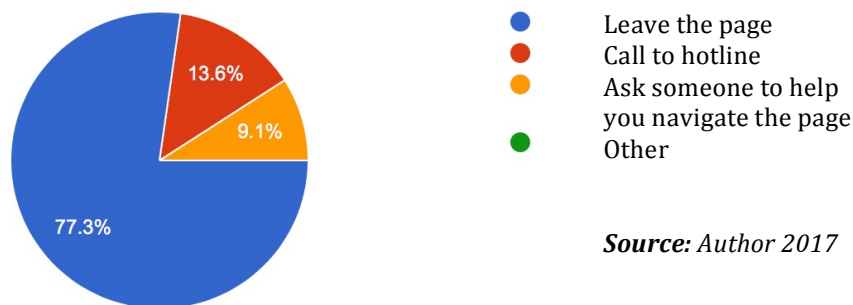
Figure 5.13. Most common website accessibility issues that Internet users with access needs experience while shopping online (in percentage)



Source: Author 2017

As it was shown on the previous chart, people with disabilities often face the problems of Web Accessibility. Another part of the survey also shows, that 69.8% of respondents face barriers in using the web page at 50% of the cases, 15.9% facing these difficulties in 75% of all cases, and 14.3% are facing them quite rare – at about 25% of all cases. As a consequence, 77.3% of Internet users with access needs leave the page, if it contains some accessibility issues. (Figure 5.14)

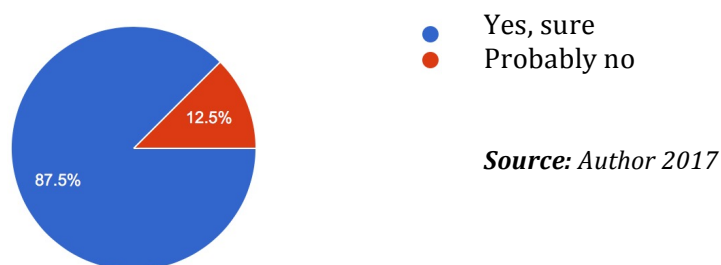
Figure 5.14. User responses to web pages with access barriers (in percentage)



Source: Author 2017

Another important indicator of users perception of Web Accessibility on commercial web pages is their attitude towards prices these sites. The survey shows, that 68.3% of respondents would buy more expensive product on a website, where they don't face a lot of accessibility barriers, rather than a cheap product on the webpage, where the accessibility is very poor for them. Another 27% said, that they are more interested in the lower price than Web Accessibility. However, the last question was intended to find out, if the users with access needs would spend online more, if the websites were more accessible to them. 87% of all respondents have stated, that they would definitely spend online more, if there were less accessibility issues on the web pages. (Figure 5.15)

Figure 5.15. Percentage of users who would spend more online if websites were more accessible



These results clearly establish that there is a measurable financial benefit in an accessible digital presence. Unfortunately, still in many organizations, the negative online experience of disabled customers demonstrates that Web Accessibility remains a problem in a lot of companies and for a lot of physically impaired users with no regard to the type of disability which they are suffering from.

5.3. WA Testing of the Commonly Used websites by CAC Respondents

One of the survey blocks was intended to determine the online spend by sector among Internet users with access needs. There are a few obvious shopping habits of the respondents: they likely to spend online more in supermarkets on grocery products, entertainment tickets (theatre, cinema, concerts, etc.), ordering food online from the restaurants, and on clothing or fashion goods.

5.3.1. Prevalence of Market Sectors in Which Respondents Shop Regularly

In the given block of the research the participants were asked to identify the retail sectors in which they are shopping most commonly (it is possible to chose as many sectors, as they wish). It is important to notice that Click Away Crown Survey offered participants choices based on general retail market sectors, and it does not demonstrate how much they regularly spend in sectors where they regularly shop.

The results of the survey showed, that Internet users with access needs in the Czech Republic most commonly spend in the following sectors: supermarkets and grocery shops 82.8%, health and medicine 73.4%, ordering food online 85.9%, entertainment tickets 87.5%. (*Figure 5.16.*) For each of this sector one web page will be chosen to evaluate it's accessibility in the next chapter. For category "supermarkets and grocery shops" the webpage of Rohik.cz was chosen, for "health and medicine" – Drmax.cz, for "ordering food online services" – Damejidllo.cz, and for "entertainment tickets (theatres, music, exhibitions, cinemas etc.)" – the ticketpro.cz was chosen for testing.

Figure 5.16. Online spend by sectors among users with access needs in the Czech Republic (in percentage)

Supermarkets and grocery shops = 82.8%	Software (i.e. applications, programs, video games etc.) = 57.8%
Travel services (flights, trains, bus tickets, tours etc.) = 62.5%	Hardware and other electric appliances = 31.3%
Insurance = 23.4%	Telephone and Internet services (e.g. Wi-Fi fees, etc.) = 53.1%
Housekeeping and gardening products (e.g. IKEA etc.) = 62.5%	Health and medicine (mainly online pharmacies) = 73.4%
Entertainment tickets (theatres, cinemas, concerts etc.) = 87.5%	Ordering food online (e.g. restaurants) = 85.9%
Fashion and clothing = 78.1%	















Source: Author 2017

5.3.2. CAC Sectors Web Accessibility Testing With the WAVE Tool

To evaluate the Web Accessibility of the webpages that correspond to the most common market sectors in which Czech Internet users with access needs shop regularly the “WAVE” Web Accessibility evaluation tool is going to be used. The “WAVE” accessibility checker is developed by “web AIM” and this tool reports all accessibility violations, and provides a hints of how to fix them.

This tool annotates a copy of the page that is being tested, and shows the original web page with embedded icons that indicate the accessibility issue, related to each element for the web page. There are few sections that indicate different types of Web Accessibility violation cases (for example “errors”, “alerts”, etc.) the list of the icons, related to each indicator are listed below. (*Figure 5.17*)

Figure 5.17. Types of accessibility errors, that can be founded by WAVE accessibility evaluation tool, their meanings and descriptions

Section	Indicator	Description	Meaning	Why it Matters?
E R R O R S		Missing alternative text	Image alternative text is not present	Each image must have an alt attribute. Without alternative text, the content of an image will not be available to screen reader users or when the image is unavailable.
		Linked image missing alternative text	An image without alternative text results in an empty link.	Images that are the only thing within a link must have descriptive alternative text.
		Missing form label	A form control does not have a corresponding label.	If a form control does not have a properly associated text label, the function or purpose of that form control may not be presented to screen reader users.
		Empty link	A link contains no text.	If a link contains no text, the function or purpose of the link will not be presented to the user. This can introduce confusion for keyboard and screen reader users.
		Broken ARIA reference	The target for the reference does not exist.	ARIA labels and descriptions will not be presented if the element referenced does not exist in the page.
A L E R T S		Redundant alternative text	The alternative text for an image is the same as nearby or adjacent text.	Alternative text that is the same as nearby or adjacent text will be presented multiple times to screen readers or when images are unavailable.
		Field set missing legend	A field set does not have a legend.	A fieldset legend presents a description of the form elements within a fieldset and is especially useful to screen reader users.
		Redundant title text	Title attribute text is the same as text or alternative text.	The title attribute value is used to provide advisory information. It typically appears when the users hovers the mouse over an element.
		No script element	A <noscript> element is present.	JavaScript enabled, <noscript> cannot be used to provide an accessible version of inaccessible scripted content.
		Redundant link	Adjacent links go to the same URL.	When adjacent links go to the same location this results in additional navigation and repetition for keyboard and screen reader users.
		Possible heading	Text appears to be a heading but is not a heading element.	Heading elements (<h1>-<h6>) provide important document structure, outlines, and navigation functionality to assistive technology users.
		Skipped heading level	A heading level is skipped.	Headings provide document structure and facilitate keyboard navigation by users of assistive technology.
		Unlabeled form element with title	A form control does not have a label, but has a title.	The title attribute value for unlabeled form controls will be presented to screen reader users.
Contrast Errors		Very Low contrast	Very low contrast between foreground and background colors.	Adequate contrast is necessary for all users, especially users with low vision.

Source: Author 2017















In order to test Web Accessibility of the websites in certain market sectors, that are visited by Internet users with access needs most commonly, the following sectors and websites have been chosen, due to the fact that these companies are providing services in the whole the

Czech Republic, not only in the City of Prague.

- supermarkets and grocery shops – <https://www.rohlik.cz/?wp=1>
- health and medicine – <https://www.drmax.cz/>
- ordering food online – <https://www.damejidlo.cz/rozvoz/praha>
- entertainment tickets – <http://www.ticketpro.cz>

The table below shows the number and types of errors on the chosen web pages. As it is shown in the table, the most common problems of all examined web pages are: missing alternative texts, empty links, missing form label, no script element, redundant links, and very low contrast. (Figure 5.18)

Figure 5.18. Number of errors on some Czech online retail stores detected by WAVE evaluation tool

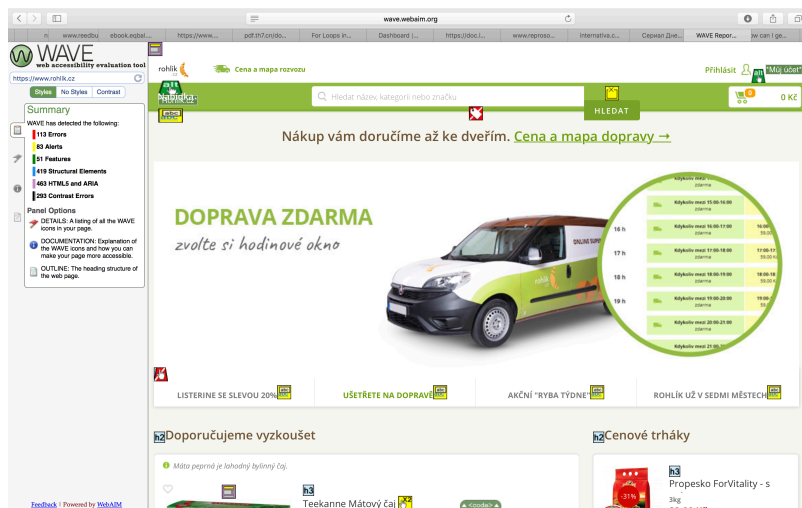
	ERRORS	rohlik.cz	drmax.cz	damejidlo.cz	ticketpro.cz
N U M B E R O F E R R O R S		108	6	13	32
		7	11	-	10
		43	4	4	2
		27	6	7	1
		30	-	-	1
		4	84	8	-
		1	-	-	-
		21	11	-	181
		3	2	277	1
		44	37	1	87
		4	2	-	1
		4	-	-	-
		1	3	1	-
		298	88	833	105

Source: Author 2017

Without alternative text, the content of the web page, including images and other elements is not available to screen reader users. If a link does not contain any text, the purpose of the link will not be presented to the user, and this can confuse the keyboard or a screen reader. If a form control does not have a properly associated text label, the purpose of that form control may not be presented to screen reader users. Form labels also provide visible descriptions and larger clickable targets for form controls. Content within <noscript> is presented if JavaScript is disabled. Because nearly all users (including users of screen readers and other assistive technologies) have JavaScript enabled, <noscript> cannot be used to provide an accessible version of inaccessible scripted content. When adjacent links go to the same location, this results in additional navigation and repetition for keyboard and screen reader users, thus, the user may be confused while navigating the website. A proper contrast is necessary for all users, especially for those, who have some types of visual impairments, or some neurological disorders.

It is important to say, that the overall design of the webpages is pretty disturbing. The navigation of these web pages is confusing in most cases. The pop ups, advertisements and moving high contrast graphics are irritatingly blinking, and the responsiveness of these websites is also relatively poor. (Figure 5.19)

Figure 5.19. Screenshot of rohlik.cz, evaluated by WAVE tool in the process of errors detection. The image also demonstrates disturbing Web Design of the site.



Source 34: WAVE.org 2017

5.4. Benefits of WA and WD Improvements on the Example of Real Company

As an example of well designed website with an improved Web Accessibility, the praguesirens[®] company will be introduced in this chapter. praguesirens[®] - is a young school of contemporary singing in Prague. Established in 2016, praguesirens[®] is Prague's international school for contemporary singing. This institution is quite young, however, the changes in customer attractiveness after the establishment of the web page is already obvious. For the first 6 month after establishing a company, its website existed in the form of a short message on company's official background color "please, visit our Facebook page, if you want to contact us". By that time, this webpage couldn't serve as a source which attracts customers to the school, but after the release of the new redesigned website, the findability of a webpage has increased rapidly. The main goal of the people, responsible for designing a web page was to create an aesthetic, highly accessible web page, with an intuitive navigation, clear design, and positive image. The website serves today as a business card of the school, and exists in three languages: English, Czech and Russian. The development of the webpage consisted of a few stages: designing a visual appearance, and developing a page in English. The website was launched in the end of November 2016, and after two months the Czech version of the site was created, and after four months – Russian version of the site. A lot of attention was paid to the responsiveness of the webpage and its accessibility and appearance on mobile devices. The number of new students has doubled within a few months. The new webpage has become a generator of higher profits and positive feedbacks from the clients. The website not only reflects completely the essence of the school and its intentions, but also it evokes a positive feelings of potential students towards the school's conceptual idea, and increases their loyalty to the praguesirens s.r.o. brand.

Figure 5.20. praguesirens s.r.o. official logotypes

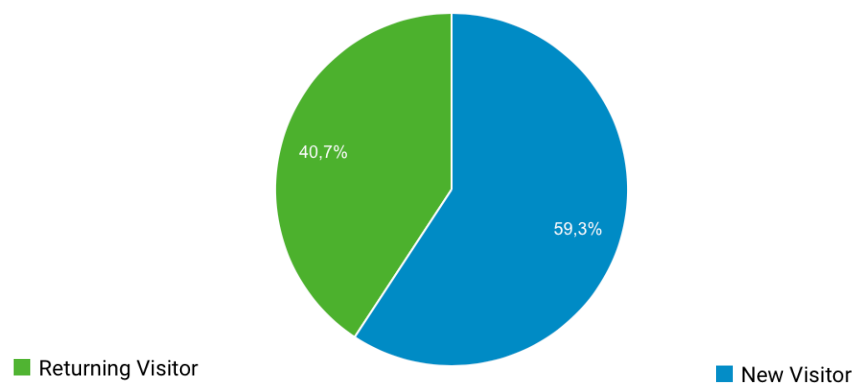


Source: Author 2017

5.4.1. Google Analytics Interpretation of praguesirens s.r.o. Website

Google Analytics (abbreviated GA) is a free service provided by Google to create detailed statistics of visitors to websites. The statistics are collected on the Google server, the user only places the JS-code on the pages of his site. The tracking code is triggered when the user opens the page in his web browser (assuming Java Script is allowed in the browser). After launching the official webpage of praguesirens s.r.o., the actual visits, conversions, and positive image of a school has increased, as it was mentioned in the previous chapter. On the *Figure 5.21*. is demonstrated, that the number of new (unique) visitors is higher than the percentage of returning visitors. This means that the findability of a website is quite high, and search engine optimization of the webpage functioning successfully.

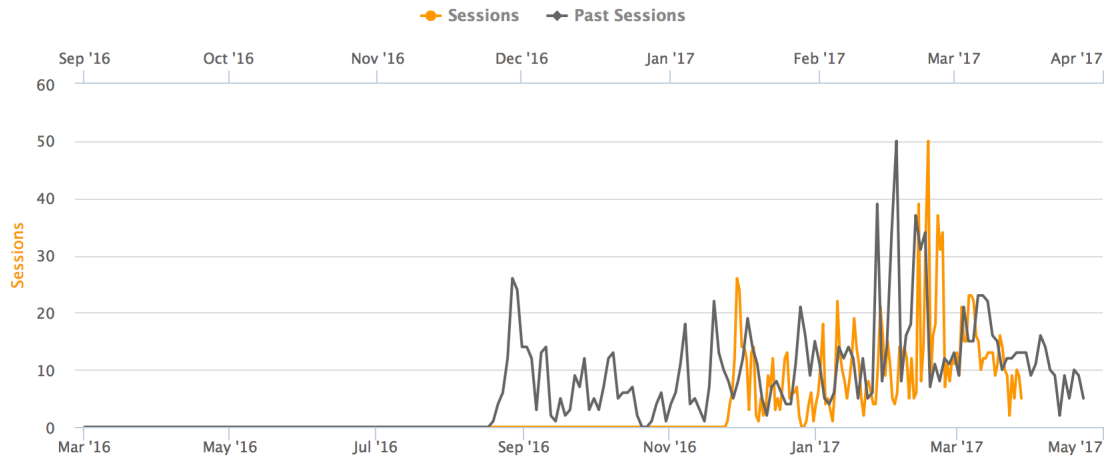
Figure 5.21. Number of new and returning visitors (in percentage)



Source 35: Google Analytics 2017

On the *Figure 5.22*. the visitors sessions to the website is shown for the period March 2016 – March 2017. The current version of the website was inserted to the domain of the old, static webpage, that was not visited by the users at all. As it was mentioned before, the webpage was launched in the end of November 2016. The rapid increase in website visitors is shown on the graph since the new redesigned webpage was launched in November last year.

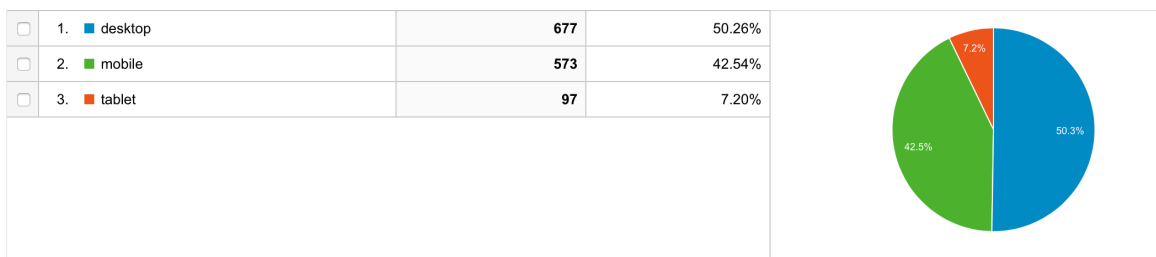
Figure 5.22. Visitor Session to the redesigned praguesirens s.r.o. Website for the period March 2016 – March 2017



Source 35: Google Analytics 2017

Earlier, in the theoretical part of this Thesis, the important role of responsive Web Designed was mentioned. A lot of attention was also paid to development of praguesirens s.r.o. responsive mobile designs. As it is shown on the *Figure 5.23* below, there are a lot of users still visit the websites more often from desktop computers (50.3%), however, the number of users, visiting the site from mobile devices is also impressive (7.2% of users visit website from via tablets, and 42.54% via mobile phones).

Figure 5.23. Type of devices, that visitors of the praguesirens s.r.o. use most often (in percentage)

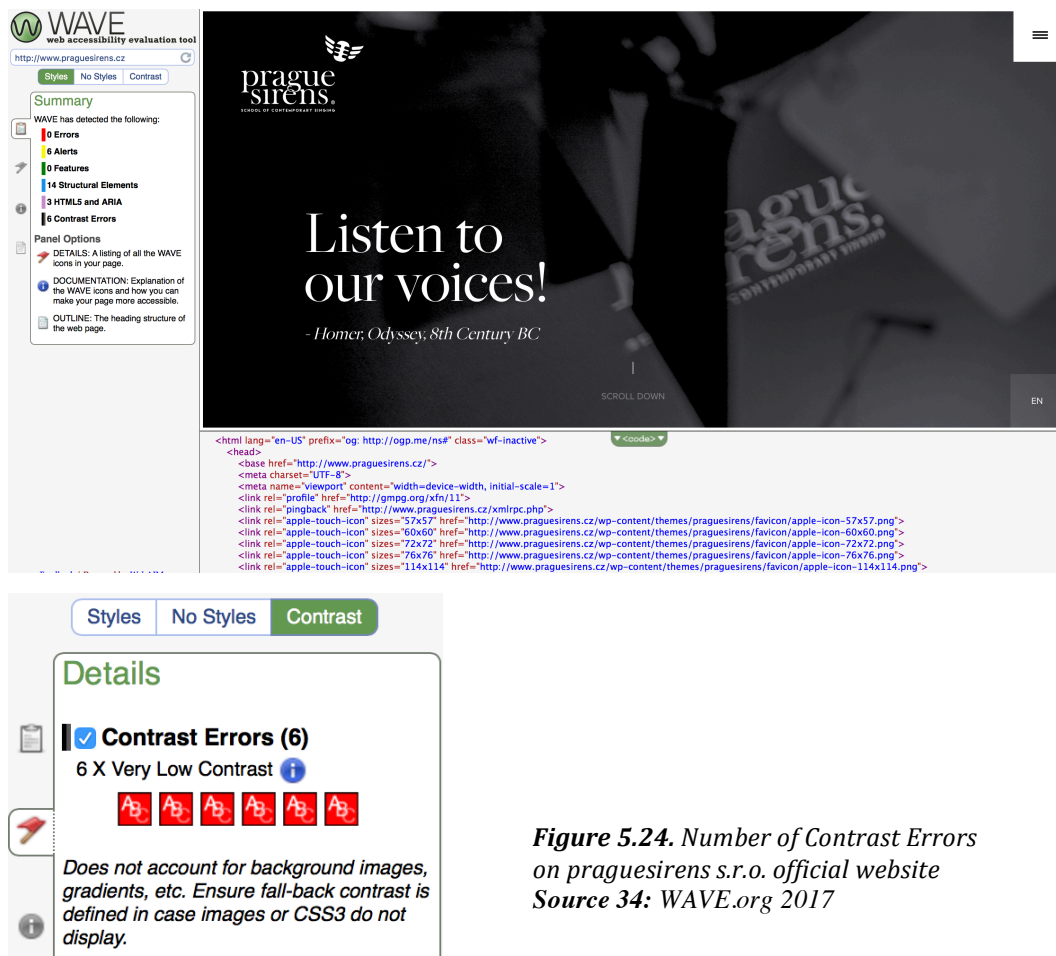


Source 35: Google Analytics 2017

5.4.2. Web Accessibility Testing of praguesirens s.r.o. Website

In order to prove the importance of Web Accessibility and Web Design in attracting customers to the business, the website of praguesirens was picked. The successful performance of the website is already demonstrated in previous chapter. In this chapter the Web Accessibility testing of the website will be performed with the usage of Wave accessibility evaluation tool. As it is shown on *Figure 5.24*, the Web Accessibility of a website can be estimated as very high.

Figure 5.24. Report on Web Accessibility testing of praguesirens s.r.o. Website



*Figure 5.24. Number of Contrast Errors on praguesirens s.r.o. official website
Source 34: WAVE.org 2017*

As it was shown on *Figure 5.24*, the Web Accessibility of praguesirens s.r.o. Website can be estimated as very high. There are no errors at all, however there are only 6 insignificant alerts. Concerning the contrast errors, there are also 6 nonconformities regarding very low contrast. This can be explained by the intention of creators to avoid the emphasis of least important text. However, even if blind users or users with low vision want to read the texts with low contrast, they can easily use screenreaders to do this.

6. Results and Discussion

6.1 The Role of Web Accessibility in Attracting New Customers to the Business

The Internet is a rapidly developing source for many aspects of human life: entertainment, commerce, education, health care, social interactions, government, employment and a lot more. Thus, it is becoming more and more important, that the web should be accessible equally to all people around the globe, including those with disabilities. Today, in times of democracy, tolerance, and when the world needs compassion so much, it is morally and ethically important not to discriminate people with disabilities, especially due to the fact, that they can be a very large, and active group of society. Furthermore, in many countries of the world, Web Accessibility is an obligatory legal requirement, which is reinforced by authorities, for example: in Canada, Web Accessibility is required by “Canadian Human Right Act of 1977”, in European Union, the “European Accessibility Act” was launched in 2012, in Hong Kong its “2001 Hong Kong Digital Strategy”, in the United States its “Section 508 – an extension to the American Workforce rehabilitation Act of 1973” etc. However, Web Accessibility not focuses just on people with permanent physical impairments, but on older users, and other individuals with a special access needs. In general, “UN Convention on the Rights of Persons with Disabilities” (2006) considers Web Accessibility as a basic human right.

However, Web Accessibility benefits not only people with permanent physical impairments, but also older Internet users, and individuals with some other specific access needs. This Diploma Thesis focuses also on the fact, that Web Accessibility may benefit organizations in today’s world as well. There is a plenty of factors that prove one undeniable statement: Web Accessibility may influence the business at a great extent. Organizations, that

don't ignore Web Accessibility compliance of their websites benefit from search engine optimization, increased corporate social responsibility, higher revenues, and advanced customer loyalty and trust. Businesses can also benefit from a substantial return on investment that overlaps any costs, connected to Web Accessibility implementation. Increased Web Accessibility leads to the main rational goal of every organization: higher profits, and direct costs savings.

This is a huge potential market, if take into account, that there is about one billion of people worldwide, who suffer from some type of disability, and according to the practical part of this research, they are ready to spend a lot of money in case, if Web Accessibility would be more developed. The CAC2017 Survey suggests, that there are 77.3% of disabled Internet users, who click away from the web page, if they face any difficulties with Web Accessibility on the page. The Survey has also suggested, that among disabled users of Internet in the Czech Republic, there is a prevalence of people age 25 – 40 years old, and vast majority of them are employed workers, and their monthly incomes are on the same level as incomes of people without any impairments, and these people are spending online in average up to 5,000 CZK per month, but they face problematic websites too often, so they would probably spend a lot more, if there were no accessibility issues on the Web.

This leads to a potential lost of thousands of customers for the companies that do not comprise Web Accessibility in the Czech Republic. Another block of the survey says, that 68.3% of these users do not care about the price so much, but they will rather spend more money for the product which is available on more accessible website. What is also important is that 87% of all respondents have stated, that they would definitely spend online more, if there were less accessibility issues on the web pages. These brief results prove, that the companies, in which disabled users of the Czech Republic are shopping online most often (such sectors as entertainment, healthcare, grocery products) are losing a huge amount of potential customers, who rather go to the competitors and buy more expensive product, but from less inaccessible website.

There are also another studies all around the world that show the same results: online spending power of 6.1 million disabled people in United Kingdom with access needs in 2016 is equal to £ 16.55 billion. The Click Away Pound Survey found that 71% of the total 6.1

million disabled Internet users with access needs in United Kingdom simply click-away when confronted with an inaccessible website.

The main finding of the Click Away Pound shows, that a potential Click Away Pound in the UK is equal to £ 11.75 billion lost in 2016 from those web sites that are not accessible for disabled users. *“Tesco, for example, implemented a fully accessible version of its British online grocery store. It cost £35,000 (USD 52,000) to develop and generates approximately £1.6 million in annual revenue, according to a case study cited by the Web Accessibility Initiative of the World Wide web Consortium (W3C). Another British company, the Legal & General Group, says that after implementing accessibility changes in 2005, its website received almost double the number of visitors seeking quotes or buying financial products. The changes also cut maintenance costs by two thirds, according to the company.”* (ILO, 2013).

6.2. The Role of Web Design in Attracting New Customers to the Business

In the given Diploma Thesis the essences of Web Accessibility and Web Design are linked due to the fact, that Web Accessibility can be achieved only by designing a website in a proper way. Furthermore, there is a myth, that accessible website cannot be beautifully designed at the same time. Hopefully, the example of praguesirens s.r.o. Website has destroyed this myth decisively. Web Design may be crucial for a lot of organizations in achieving their main goals, and the proves are as follows: well-designed websites may influence the conversion rates of the companies, it is increasing the findability of the website, and improves customers loyalty and trust to the organizations. When users experience some types of difficulties in navigation, or find a webpage unattractive because of its disturbing content or appearance they will most probably leave the page, and move to another website. Wording and navigation undoubtedly serve as the “call-to-action” elements of the website. Colors are one of the most important participants in building “attractive” websites. From SEO, branding and loyalty, to conversion rates, increased traffic and more, the site’s Web Design plays a major role in how the brand is perceived by the website visitors and potential

consumers. Delightful design is the very first thing that the visitors will notice about the website and an attractive, functional Web Design will increase the credibility with visitors.

In a broader sense, the design of the website is the same as an interior in the commercial premises, the attitude of the employees, or a valuable logo, that helps organizations to become a successful and recognizable brands. *“Websites are powerful tool for building brands. A well-designed site facilitates branding, but poorly designed web site can destroy a brand. There are three stages overlap rather than being distinct. In each stage, user requirements concerning functionality and web interfaces are unique. During brand building, the Web Design should be dynamic. Since Web Design significantly affects all three stages of e-branding in different ways, the following subsection describe the basic consideration of Web Design for each stage.”* (Cook, 2003) Responsive Web Design may be crucial as well, because in modern society people start to use mobile devices more and more often instead of using their desktop computers. The advantage of responsive website, is that the information from this site may be perceived by the visitor with no regard to where and when this visitor is located, or what the one is doing.

The example of praguesirens s.r.o company, which was mentioned in the practical part of the Thesis demonstrates, that launching a well designed website leads to increased customer attraction, and thus improves the overall performance of the company. The benefits of the decent website development, which reflects the main idea of the organization are obvious: the presence of the company on the market became much more visible, the number visitors to the webpage has doubled, and the conversion rates of these customers into students became very high. The identity of the organization has strengthened, the positive image has increased rapidly, and therefore, the revenues of the firm became two times higher within just few months.

Conclusions

In answering the question “Is Web Accessibility and Web Design attracts new customers to the business and improves the overall performance of the company?” the answer is an unequivocal “yes”. A brief look at the numbers in the practical part of this Diploma Thesis, which was dedicated to “Click Away Crown Survey 2017” should be enough to persuade organisations that they are excluding millions of potential customers by ignoring the compliance of their web sites with Web Accessibility requirements and by neglecting the improvement of Web Design of the site. Businesses also need to bear in mind that if a disabled shopper clicks away from their site to one of their competitors, they show little inclination to return. This finding emphasises the high level of priority that disabled users give to website accessibility with willingness to prioritize the accessibility of the website over the cost of the product. This has major financial implications for both the shopper and the businesses who fail to have accessible sites. For those businesses that appreciate the issues and make sure that their websites are accessible to disabled shoppers, there is the significant business benefit of access to an additional customer base of about 800,000 people in the Czech Republic alone. This survey suggests that website accessibility and usability barriers would cause 77.3% of disabled users to ‘click away’ to an accessible alternative site. Accessibility is the gateway to an online market currently might worth 1.5 billion CZK in the the Czech Republic alone.

This Survey clearly establishes that there is a measurable commercial imperative in an accessible digital presence. Yet in many businesses, the negative online experience of disabled customers suggests that disability issues remain to be problematic. Considering what needs to happen next is clear in a general sense – retailers need to make their online presence accessible. Especially those, who belong to the market sectors that are most usable by disabled online shoppers in the Czech Republic. Not to do so in an increasingly competitive online

retail market means simply directing customers to a more accessible competitor. The example of praguesirens s.r.o. accessible and well designed website demonstrates, how Web Design and Web Accessibility may attract more customers to the business, and consequently increase the incomes of the company. The example of praguesirens s.r.o. Website, and the results of the Click Away Crown Research show, how important is responsive Web Design nowadays. However, Web Accessibility doesn't concerns just disabled users of the Internet. In recent years, older people became an important potential market for many companies, due to the fact, that life expectancy in many countries has increased during the last years and older people became generally a large percentage of web users. In addition, accessible web pages are more likely to be used by people with permanent and temporary impairments, caused by any reasons.

Older Internet users and people with special access needs are likely to be loyal consumers of the products and services, provided by the webpages, that work properly for them. Furthermore, so called "viral marketing" can work splendidly among these groups of people. Web Accessibility also increasing the use of the web by people, who works with different devices, and makes it possible for users to access the web in different conditions, e.g.: poor Internet signal, inappropriate environment, usage of a faulty device, etc. All these factors are increasing the usability of the website by more people, hence, expands the potential market share for the business. The importance of improved Web Design may be crucial for a lot of commercial websites, due to the fact, that in addition, it is important to understand, that Web Design may influence the conversion rates of the company. It is obvious, how navigation and usability is related to the conversion rates. The websites, which present some kind of challenges for users no navigate, will be most probably considered as unattractive one, and the users will lose the interest in this web page. It is also possible to financially calculate all of the financial benefits of Accessibility improvements with such indicators as NPV, Break Even Point, IRR, ROI, and others, as it was demonstrated in the previous chapters. To conclude, it is important to note, that technologies are developing rapidly, and disabled people today represent a large group of people, who is in need of these technologies the most, so it is important to remember, that each new technology has to be accessible to all people in the world today as well as in future.

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