Web agencies
adaptation of accessible
web directives
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Scope: 15 credits

Date: 02-04-19
Abstract

Digital divisions are getting smaller in Sweden which makes the range of users wider than ever before. This results in higher expectations and requirements on web in order to be sufficient for everyone. This study investigates how web agencies work with web accessibility, why some do not work with it and solutions making daily operations more efficient. This is a qualitative study with an inductive approach, where semi-structured interviews were used to gather empirical data. Six web agencies in Jönköping took part of the study through interviews. In order to analyse the empirical data we used thematic analysis. No unknown methods or techniques were discovered along the study. There were surprisingly few agencies that worked with accessibility at all of those who took part in the study. Some of them more than others, but overall it was low prioritized. Lack of knowledge within the subject became the main reason for not develop for accessibility. An immature and non-standardized industry might be the explanation behind that. Not surprisingly, resources in form of economy is also a reason. It turns out to be hard for agencies to motivate customers to pay for accessibility. However, the motivation process with customers is rarely supported by enough knowledge and leads therefore to insufficient arguments, which does not motivate customers enough to pay for it. Further on, include web accessibility as a given part of CSR plans on both agencies side, but also motivating it for customers. The importance of a mature dialog about it is crucial for survival of accessibility. All parties of a development process should take their responsibility. Everyone can and should participate in the journey towards a more equal society.

Keywords

Accessibility, WCAG 2.1, Implementation, Web Agency, Disability.
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1. Introduction

The digital divisions in Sweden today is getting smaller and smaller and there are less people in digital exclusion. This means that people with different backgrounds, abilities and knowledges uses the internet everyday, either for private use, work or both (Davidsson et al. 2018). As a result of this we understand the importance of making the web accessible and understandable for everyone by offering the same prerequisites when using it. Today’s technology can create both digital participation, but also digital exclusion and is important for developers to keep it in mind (Johansson, S. 2018). Accessible web gets more and more important, especially in the public sector because of the new law that recently took effect (DIGG, 2018a). Accessibility on the web is achieved through great awareness when developing but also through code techniques that assists different assistive technologies. This paper examines how web agencies think and act around accessibility and discussing its importance. It also discusses who owns the responsibility for making web more accessible. There are many parties involved when websites are build. The theory behind supply and demand is hard to apply when it comes to disabilities since people with disabilities always will remain a minority. Some agencies works more with this, other less. Findings and results will still examine how they work and prioritize this important domain as a part of their daily operations. Is creating accessible web an important step in their workflow, no matter what customer or project? The exam work has been carried out at the School of Engineering in Jönköping in the subject area Informatics. The work is a part of the three-year Bachelor of Informatics in New Media Design. The authors take full responsibility for opinions, conclusions and findings presented.

1.1 Background

During several years the European Union has been working on minimum requirements for digital services in the public sector in order to make sure as many people as possible can utilize web services in a smooth way. As a result of this, EU set down new directives in October 2016 which had to be fulfilled before latest 23rd of September 2018 (Jägerklou, 2018). A new law was formed and the 1st of January 2019, the swedish government introduced the new law with directives for accessibility on the web and mobile applications in the public sector. The law includes requirements to meet for authorities, municipalities and similar, to make web accessible with guidance from Web Content Accessibility Guidelines - WCAG (DIGG, 2018b). WCAG is a set of guidelines that assures web accessibility and is brought by Web Accessibility Initiative (WAI) which is an initiative of World Wide Web Consortium (W3C) that is an international community working for developing web standards (W3C, 2018a). The guidelines over all in WCAG are meant to be used by developers in order to make the web more accessible, especially for people with some kind of functional impairment, but can nevertheless advantageously be used by everyone to create more accessible and understandable web (W3C, 2018b).

According to Schulz (2016), all member states of the european union can individually decide any further acts that will be affected by the directives, beyond the public sector. Further on, Jägerklou (2018) says that due to the unsure economic effects this would lead to, Sweden has decided to not involve the private sector yet. However there is still room to expand these directives over time and include websites holding infrastructure, for example services
regarding water, electricity and network operators. The new law is brought so that public services from now on are legally forced to have accessible websites and applications in line with WCAG 2.1. This creates a lot of work for web agencies in Sweden. Approximately, this will affect 4000 websites and over 1000 applications, only in Sweden. The estimated cost for this is 1.7 billion swedish crowns over a period of 3 years (Jägerklou, 2018). As a result of this law there might be an overall increased and intensified discussion about accessible websites in general at web agencies, not just when developing for the public sector. That is one of the aims of this study to investigate. As stated by SCB (2016), in the ages of 16-85 years old there are more than 200.000 people that have assigned problems during their use of computers and internet because of their disability (SCB, 2016). Even though 200.000 people is much people, it still does not represents more than barely 2% of the total swedish population (SCB, 2018). That makes this group of people a minority. Law (2009) means that if the demand rises, no matter if it is a product or service, both supply and price will increase, but also that rise in supply will make the price and demand decrease. As long as there is a low demand of accessible web sites, the price of these will remain high (Law, 2009). This report handles whether the price is a contributing factor to a low demand or if there are any other factors. Although, the demand can increase without necessarily having more people with impairments. As Schulz (2016) states, the law may expand and include broader services outside the public sector in the future which definitely will increase the demand of accessible websites. An expansion of the law regards whether instances like electricity, heat, water or private healthcare will be included in the future (Schulz, 2016). This is very interesting and contextualises the following research questions.

Inevitably, this leads towards a broader perspective of accessible web. There are laws, rules and guidelines for almost anything everywhere else in the society when it comes to adapting for accessibility (MFD, 2017). Svensson (2012) explains the main goal of the swedish impairment politics which is a social community where men, women, boys and girls with functional impairments should be fully involved in the society on equal conditions. People are having different prerequisites where impairments are one of many variations a population can have. It is now time to get an insight into the digital world and investigate web agencies and how they are adapting to a climate where functional impairment should be seen as a natural including within all parts of a society.

1.2 Purpose and Research Questions

The purpose of this report was to get an insight of how web agencies work for accessible web for people with disabilities. With the knowledge that there are guidelines and directives to follow we wanted to investigate how often and when they are implemented. Do they value it equally much for different clients, nomather if it is a client within the public or private sector or nomather if it is a big or a small client. Clients within the public sector are henceforth legally binded to implement accessibility in new projects and have to rework existing platforms to be accessible. That made it interesting to investigate how web agencies works with the private sector, since there is no legally forcement. Therefore we wanted to see if agencies working more towards the public sector have a higher likelihood to work with accessibility within the private sector as well. We also wanted to investigate if there were any reasons why they would not follow the directives for creating accessible websites.
This study aims to raise awareness of problems that can arise if the web is not sufficient enough for everyone and also more specifically how agencies work to counterwall this problem. It will state how web agencies work for contributing to a better equality in the society by giving everyone the same prerequisites in digital environments. It also gives an ability to form new or adjusted methods of how to create accessible web.

The research questions are as follows:

**Research question 1**
How does web agencies priorities creating accessible web, by following existing guidelines and standards?

**Research question 2**
What could be reasons why web agencies are not creating accessible web?

**Research question 3**
What can be effective ways for web agencies to implement accessible web directives as a part of their daily operations?

1.3 Delimitations

Accessibility on the web is a very known and elaborated domain and this thesis will therefore not try to contribute to any new guidelines in how to improve development techniques for accessibility. There are already extensive directives on how to do this. Therefore, this paper examines the interest of the adoption of the guidelines instead. The interview conducted with the person having a functional impairment is not to be seen as a foundation for improvements. That interview was conducted in order to gain knowledge and perspective from the users point of view before analysing and discussing the results from the interviews with web agencies. We decided to only reach out to web agencies in Jönköping due to short period of writing this study.

1.4 Outline

I. **Introduction**

   This chapter presents the background to the chosen topic, which is web agencies adaption of accessible web directives, and the purpose of why this topic was chosen. It gives a presentation of the study’s research questions, that is answered in the end of this study. To make sure that the right questions were answered and that the report would not be too extensive, delimitations is also presented in this chapter.

II. **Theoretical Background**

   In this chapter, the theoretical frame of reference that builds the background of this study, is presented. It gives a brief overview of how web agencies usually work today and what the expected roles does. Accessibility for web is explained more in detail and what components that are affected in the process of creating accessible content. There are many factors that matters and some of the most important development techniques are highlighted here. In order to understand these techniques, it is
necessary to understand the foundation of web development and therefore HTML, CSS, CMS and other essential web terms are explained here. Further on, it goes through how internet is used by swedes and which functional impairments that can be distracting while using internet. The most common helping tools as well as laws and regulations is explained here. This chapter lays a foundation for all the hypotheses that this study is built upon.

III. Method and Implementation
This chapter presents the research method that has been chosen, which is qualitative interviews with web agencies and persons having difficulties using the web. It also explains how the interviews were conducted in order to collect the empirical data needed and how the gathered material was analysed.

IV. Findings
Here the results of the empirical data collection is presented. Each interview is summarized with the relevant data for further analyses. The table shows some of the most essential information about the web agencies in order to get a grasp of size and establishment each web agency has. All of the interview findings are presented under separate headings.

V. Analysis
Here the findings is analysed and lay a solid ground for further discussions and conclusions. The empirical data will be analysed along with the theory from the theoretical background together with own thoughts about the findings.

VI. Discussion and Conclusion
This chapter presents the discussions regarding the choice of research method and what empirical data that was received after execution. This is followed by conclusions which have been drawn from the analyses made in the previous chapter.
2. Theoretical Background

2.1 Web Development

The industry of web development

Connolly and Hoar (2018) puts the web development industry in six different categories. Depending on where companies have their focus and competence they are specialists in different domains. Those six categories are companies working with hosting, design, website solutions, vertically integration, start-ups and internal web. Companies participating in later interviews are website solution companies, start-up companies and vertically integrated companies. Website solution companies works with managing existing sites but also the development of new website solutions and custom solutions with clients. Vertically integrated companies takes care of everything within the development process regarding hosting, design and application solutions. A so called one-stop shop. Lastly there are start-up companies. These are not that experienced within the industry but is a great place for new graduated students to become full-stack developers.

2.1.1 Roles within web development

There are multiple roles within the industry of web development. In the interviews which will be conducted, these roles will come up and are therefore explained briefly here. Connolly and Hoar (2018) lists roles and skills within the industry. All of them are not relevant for this study and the ones brought up here are those considered relevant to know.

Developer/Back-end developer/Programmer

Programmers or back-end developers can be assigned a wide range of different tasks, not just pure coding. Usually when speaking of programmers or developers, these are expected to do server-side development and writing code in languages like PHP. Although, developer is a widely used term that may aim at other roles as well a developer in this report works more towards the server side of development (Connolly & Hoar, 2018). Back-end developers are rarely or never involved in the process of making websites accessible, but is mentioned during interviews and is therefore relevant to mention.

Front-end/User Experience developer

As functions has become more complex, the need of great interfaces has become important. A front-end developer handles what a user sees and makes it functional. Advanced Javascript and great CSS skills are required to perform the tasks a front-end developer used to work with. User Experience developer (UX-developer) is not far away from front-end developers when it comes to tasks. An employee may have both roles, otherwise these are working close to each other. Although the UX-developer is more concerned about human computer interaction (HCI), they are both working with the graphical user interface in different ways. A front-end developer puts the UX-developers mockups into reality. UX-developers and UX-designer are just different words explaining the same role (Connolly & Hoar, 2018). Since the accessibility part is mostly carried out in the user interface or behind it in code, the front-end- and UX-developer is highly involved in the process of making websites accessible.
2.1.2 Technical terms

**HTML**

HTML stands for HyperText Markup Language and is the skeleton of all web pages. In order to style and arrange text, images, graphic elements and much more, they have to be defined by some kind of structure. This structure is what HTML provides. Following examples shows a heading, link and footer element. An HTML element is build up by a start tag and an end tag (Connolly & Hoar, 2018). See Code Block 1.

```html
<h1>This is a heading</h1>
<a>This is a link</a>
<footer>This is a footer</footer>
```

*Code Block 1, Basic HTML elements.*

By default, these elements are given a definition and an appearance. The important part here is the definition. Styles can always be changed later on. Browsers will not display the HTML tags, but render what is in between the tags in different ways depending on the tag used (Connolly & Hoar, 2018). This is useful knowledge in order to understand how solutions regarding accessibility are build, which is explained more in depth in chapter 2.5.3.

**HTML Attribute**

All HTML tags can have attributes. Attributes are needed in order to give HTML elements extra information. The link tag seen in Code Block 1 is useless without an attribute called *href*, which gives the possibility to enter the address where the link should direct to. Attributes are always put in the start tag. Code Block 2 shows how attributes gives more information and purpose to HTML tags. The class and id attributes are used to assign an identification to the HTML elements (Connolly & Hoar, 2018).

```html
<h1 class="MainTitle">This is a heading</h1>
<a href="http://www.website.com">This is a link</a>
<footer id="MyFooter">This is a footer</footer>
```

*Code Block 2, HTML attributes added in green within the first tag.*

**CSS**

CSS stands for Cascading Style Sheet and is what makes internet pretty. CSS is a W3C standard to describe the appearance of HTML elements. CSS handles font sizes, simple animations, typefaces, colors, borders, background images and much more. CSS can be added directly as a style-attribute within an HTML tag, or more commonly in a separate text file that only holds CSS. With CSS all visual things can be decided. Great contrasts, structure, margins and paddings are essential styling parts when it comes to make information perceivable for those who can see the graphical user interface (Connolly & Hoar, 2018). Some does not and that is when semantic HTML comes into the picture. This is further more described in chapter 2.4.3.
Javascript
Briefly explained, Javascript is a programming language used to create functionality on the web. I can access and manipulate the HTML and its contents and appearance. It is a popular programming languages within today’s development of websites and applications (Connolly & Hoar, 2018).

CMS (Content Management System)
Content Management System is a multi user software that enables smooth management of content on a website. Instead of put all content of a website directly into code, the CMS has made it easy for everyone to write, update and delete content for people to consume it via web sites (Barker, 2016). Examples of CMS-brands like Wordpress, Drupal, Episerver, Umbraco, Litium and Sitevision are all used for similar purpose, with some various features and appearance.

SEO (Search Engine Optimization)
Search engine optimization is about ensuring that a website is shown in search engines in a good position when searching on specific words. In Sweden, Google can be considered the only search engine but there are more of them, like Yahoo. Other search engines than these are not worth any effort. The position of a result on a search is based on multiple factors and is of course of big importance whether you are hit number one or fifty one. A higher position results in more traffic, and that is why SEO is so important and well known by web agencies (Bråth, 2008).

2.2 Usage of Internet in Sweden
In an investigation carried out by Internetstiftelsen i Sverige (IIS) it turns out that 98% of the swedish population have access to internet at home. The rate of people who are using internet in Sweden is still 94%. Up to the age of 65 years old, a majority are using internet. From 65 years old and older, there is a weaker amount of internet users (Davidsson et al. 2018). See figure 1.

With these facts it goes without saying that there are thousands of internet users with disabilities within the ages 12–65 years old. However there is still hard to tell exactly how extensive the problem is with bad accessibility on the web. Another investigation made by Johansson (2018) addresses the complexity behind asking people about their perceived effect
ones disability has on usage of internet. Some of their bullet points are relevant to mention. For example there is hard for someone to distinguish whether it is the disability’s fault that it is hard to use internet. It is hard to find people with representative disabilities for a study. All disabilities are not easy to understand and answers from people with these kind of disabilities can therefore be hard to analyze answers. Johansson (2018) gives critique to SCB and their study about swedes “Use of computers and the internet by private persons in 2016” as we read in the background of this report. SCB states that in the ages of 16-85 years old, there are more than 200,000 people that have assigned problems during their use of computers and internet (SCB, 2016). The critique Johansson (2018) wants to emphasize is that it is a big difference in how persons with different diagnoses or disabilities experience difficulties while using internet. However, SCBs’ statistics will give an indicator of how extensive the problem is. It is impossible to measure exact people experience things.

2.3 Previous Study within the Domain

Another complex thing to measure is how accessible a website is. Infrastructure, guidelines and technology are all tools being used in a very non-standard way. This makes the whole industry of web development a pretty non-standardizational industry. However W3C have set up standards and guidelines, the adoption of those are extremely varying among websites. As long as people have free access to contribute to the world wide web, it is impossible for anyone to assure standards and guidelines are followed (Harper & Chen, 2012).

In Harper & Chen (2012)’s investigation, they built an accessible evaluation tool that measured 6,000 and their indications of adopted accessibility over a period of ten years. This is possible through Internet Archive which provides public access to collections of among other things, websites. Even though it has happened a lot within the industry since 2012, this was the latest evaluation of this kind of problem founded to get a somewhat good indicator of how extensive the range of “not-adapted-to-accessibility-websites” is. The result of Harper & Chen (2012)’s study may be discussed as it is hard to tell how disabled people actually perceives websites in their specific situation, but also because of their choice of method. They measured to what extent websites adopted accessibility guidelines through a Web robot, which is a software application that runs tasks over the internet. A brief summary on how the measurements of followed guidelines were executed as follows. The searched terms the Web robot they build looked for on websites were as follows:

- Hyper-links to validation sites
- Various image accreditation badges
- A combination of AAA, AA and A
- “The presence of the word ‘accessibility’—present anywhere within that last 100 characters of a page to account for statements and links to intra-site pages describing policy.”

They mention that the interest of the study was not about whether the guidelines were followed or not, since it is hard to measure adoption of accessibility automatically in large
scale, but it rather gave an indication of how “trendy” it were to mention accessibility on websites. Harper & Chen (2012) summarizes it like this in the following quote:

“In this way, it could be said that this is an approach to measure how ‘trendy’ accessibility is or how accessibility aware the developers are, and if accessibility is important enough to consider notarising its presence on the page…” (Harper & Chen, 2012. p. 70)

Harper & Chen (2012) gives their choice of method some more critique, but summarizes everything with interesting findings. It turned out that over a ten year period the terms connected to accessibility stated above increased over years. There were both top ranked websites on Alexa but also random picked websites included in the test.

![Graph showing search term usage over 10 years](image)

Figure 2, shows how search terms appears in Harper & Chen (2012)’s study over a period of 10 years. (p. 76)

This seems to be an a bit odd method of how to measure accessibility, but was the only one founded which addresses and concerns the same kind of questions as this study, about web agencies adaption of accessible web directives, does. It teaches us how complex it is to measure adoption of accessibility, that it however is an increasing trend of the usage of accessibility-words and that many factors can affect the result of such a study. Based on this knowledge and some other factors we have chosen qualitative data instead in order to get an indication of the situation today.

2.4 Disabilities Affect on Web Usage

2.4.1 Visual impairment

There are several difficulties that occur for people with visual impairment using the web if the web is not sufficiently accessible. The most difficult ones are often related to these areas when it comes to web accessibility; complex notation, image rendering, multimedia, frames, forms, tables, navigation, Javascripts and programming code (Paciello, 2000).
There are different types of visual impairments, blindness, low vision, colour blindness, and glaucoma. These are just examples of some of them and all require different accessibility approaches in order to be helpful. Each type of visual impairment is in need of different things. When having Glaucoma, your vision is restricted but not gone. Their interface experience gets better with factors considered like, background color, enlarged graphical elements, the arrangement of the graphical elements etc. People with blindness need other type of adjustments. Some uses assistive technologies, like screen readers, for helping the users reading the text out loud through a synthetic voice. But these do not work on their own if the overall website is not sufficiently accessible. They can only read the text but not for example the pictures, so it is important that the website is adjusted for this, for example having an descriptive alt tag. When having low vision an ability to see a high contrast representation of images, text messages and windows will enhance the experience for the low vision users (Harper, 2008).

2.4.2 Hearing impairments

According to Harper (2008) people that has an hearing impairment in the world were estimated to be about 278 million people, which correspond to about 4.3% of the whole population, in 2005 according to The World Health Organization. The popularity of the web have helped people with hearing impairments to participate and take part of information, through for example video phone calls, be able to blog in form of vlogs in sign language etc. There is although a huge amount of multimedia that is not adapted for people with hearing impairments. It is important to provide visual alternatives such as sign language synthesis, captions or transcripts for information that is inaccessible auditory. Captions does not only benefit people with hearing impairments it also benefits people that do not want to listen out loud, which speakers are broken, people who are in public, noisy places etc. A system that forms text or spoken languages into sign language on video is called sign language synthesis. Nomather of type of translation there are although some overall difficulties of translations. For example a sign language synthesis has difficulties sometimes to realistic sign languages and automatic translations between sign language and written or spoken languages can often be wrong, just as automatic translation between any languages. (Harper, 2008).

2.4.3 Physical disabilities

There are different conditions that can result in physical difficulties such as Arthritis, Parkinsonism, Tremor, Dystonia, Spasm etc. All these affects the ability of using a computer and taking part of the digital environment. The second largest accessibility group is the group of people with physical impairments. Some of the most crucial things for accessing and navigating the web is pointing and clicking. For people with physical impairment this can be a real challenge, some uses keyboard shortcuts instead as an alternative way of navigating, some uses eye tracking etc. Especially the small targets on a website like checkboxes, radio buttons and scroll bars. Somewhat uncontrollable and unwanted clicks can often be the problem during the mouse pointer movement. For some conditions like for example Tremor and Parkinsonism it can be especially hard for keeping the cursor pointer on the target while clicking and avoid slipping off the target and risking to click on something the user did not intend to. Dystonia can make it difficult to use the technology in the right way for example people with that condition might have to use the mouse in a different way, using both hands or moving it with their wrist. Which also makes it hard to hit their target. These are just a few examples of some difficulties that might occur. According to a study about web accessibility
for people with physical impairments the three most important things to consider are clarity in the navigation of the website, avoiding confusing page layouts and try to avoid small text and graphics that are clickable (Harper, 2008).

2.4.4 Cognitive impairments

Cognitive Impairments are harder to develop accessible websites because there are no easy checklist to go through when developing. The diversities of possible barriers that they can come across are as many as the diversity of the human cognitive faculties. The human cognitive faculties are extremely diverse and therefore a lot of different cognitive functions can be impaired. Impaired functions like memory, attention, visual and spatial perception, emotions, language and executive function are functions that often are affected in cognitive impairment. Each of these functional impairments have many aspects of its own that needs to be taken in consideration. For example the functionality, language, it involves reading, typing, spelling, understanding, syntax etc. This is just a few of all aspects that are affected by that specific function, which means there are a lot more to take in consideration (Harper, 2008).

According to Harper (2008) there are studies that have shown that by creating accessible websites for people with cognitive impairments also help with problems for all users as well because the problems for people with cognitive impairments are often problems for all users. The only different is that it is a bigger problem for them, the impact it has on them is bigger and they might have a harder time coming back from it. For example a back-button or a long heavy text (Harper, 2008).

2.5 Web Accessibility

2.5.1 Definition

Web accessibility simply means that everyone, no matter circumstances and disabilities can use the web equally. There are many examples of disabilities that can make it more difficult to use the web if it is not accessible. Somebody who cannot use their arms properly and therefore needs a mouthstick to navigate and type. There are people that cannot hear well and therefore needs captions when they are watching videos. A blind person can only navigate through a site by using a screen reader. Then there are persons who just needs better contrast on a site due to reduced sight. What many people forget here is that it does not have to be a permanent disability. Temporary disabilities are also important to keep in mind, and this puts the importance of this subject in a whole new position (W3C Web Accessibility Initiative, 2017).

Web accessibility benefits everyone, even people who does not have any disabilities. Some work is visible for the eye, some are just fixes under the hood and is only visible in written code. W3C’s instance WAI provides standards that helps developers make the web more accessible. Most internationally known is the Web Content Accessibility Guidelines, shortened WCAG. WCAG is the ISO standard 40500 which has been assigned by the International Organization for Standardization. ISO is an independent, non-governmental organization, working to produce standards between countries (ISO, n.d.). It is also adapted in the European standard EN 301 549, where EN(European Norms) works similar to ISO.
The WCAG guidelines are built upon four main principles (W3C Web Accessibility Initiative, 2017).

**The four main principles**
The first principle is Perceivable. People should be able to see or hear the content. The second principle is Operable. It is what it sounds like. People should be able to operate websites by either typing or for those who cannot type, operate it by voice. A concrete example of how to not do would be to place essential functionality within a hover-effect. In that way, the ability to access information is taken away for someone who cannot use a mouse for navigating. The third principle is Understandable. Make sure to have clear and simple language. The fourth and last principle is Robust. Websites should be robust so that a wide range of users can make use of their assistive technologies, for example zoom tools, screen readers, change font size or typeface (W3C Web Accessibility Initiative, 2017).

**Succession criteria**
Every guideline in WCAG, there are success criterias. These are categorized in three levels where “A” is lowest, followed by “AA” and “AAA” (highest). In this way it is possible to set a level of accessibility requirements, even though it is important to remember that a website can still be hard to use for some users. But these levels of criterias gives a somewhat good indicator of how accessible a website is. “A” is requirements that must be fulfilled if a website should be accessible and “AAA” can be fulfilled if a website should be as accessible as it can be (W3C, 2018d).

2.5.2 Components of web accessibility

According to Lawton Henry (2018) there are some components of interaction and web development that needs to work together in order for web to be counted as accessible. These components are listed and briefly explained here.

**Content**
Content includes the information given through a web page. It can be text, images, sounds or videos. It also includes the code or markup that defines structure of the content. HTML is the most important piece which holds the key features of markup (Lawton Henry, 2018).

**User agents**
Web browsers, media players or other programs used to render code or files in order to make it conceivable for users (Lawton Henry, 2018).

**Assistive technology**
Depending on the disability, sometimes assistive helping tools may be used. For example screen readers, alternative keyboards or mouses, cameras for navigation, etc. (Lawton Henry, 2018).

**Users**
Someone that uses the websites. Users previous knowledge and experience on web affects how web is perceived and used (Lawton Henry, 2018).
**Developers**
Developers refers to those who creates websites. But it is also authors of content, designers and users who contributes with own content (Lawton Henry, 2018).

**Authoring tools**
These are tools for making web. Text editors, CMS, etc. (Lawton Henry, 2018).

**Evaluation tools**
Lastly there are tools used to evaluate code when developing. HTML validators, CSS validators that controls whether code is written in a proper way and that it assists for example screen readers (Lawton Henry, 2018).

All these components are important parts that must be taken into consideration when working with accessible web. Figure 3 illustrates the bigger picture of accessible web. The left, blue side describes the developers perspective and the right, yellow side shows the users perspective. In the middle is the content which both parts are highly connected to (Lawton Henry, 2018). This figure is great to keep in mind within the rest of this report. The research questions are more related to the developers side in the image and how they work for a better experience on the right side.

![Figure 3, components within the area of accessible web (Lawton Henry, 2018).](image)

2.5.3 Develop for web accessibility

It all comes down to one question. How to develop for web accessibility? What are the things, components and techniques needed to be done in order to make a website accessible? These questions are to be answered here.

**Focus**
Normally, focus appears as a blue rectangle around clicked objects, for example an input field in a form. This depends on what browser one uses, but in most cases it is blue. When an input field is clicked and ready to be typed in, it usually appears a slightly shaded rectangle around that input field that is telling the user where on the page they are to focus. For someone who never have used a keyboard to navigate a web page, this function might seem unnecessary. But imagine the user is unable to use a mouse and have to navigate, only using their keyboard. In order to see where on a page they are, there has to be a focus point somewhere.
Without it, it would be totally impossible to know what object is in focus. As mentioned previously, this is also a feature that benefits everyone. With a great developed web page with proper markup and tab order, anyone will be more productive on such a page. The `tab` key is the key to go through elements on a web page. Pressing `Shift + Tab` makes the focus point going backwards. Within a component, let us say a dropdown-menu, the user can hit the array keys to navigate between options. By default there are some objects that are going directly into a tab order of a web page, for example input fields, buttons and select menu, in other words elements meant to interact with. Normal elements like headings or paragraphs are by default not put into a web page’s tab order because there usually is no need for it (Google Developers, 2019a).

If a web page has been built with great HTML-markup, the tab order should be good. But sometimes there can be situations where an element should be put earlier in a tab-order than it is on a page. In Code Block 3 there are three links to different websites. If one would tab through these three links they would be focused by the order Hello link, Website link, Foo link. `tabindex=""` is used to set the tab order.

```html
<a href="http://www.website.com/" tabindex="2">Website link</a>
<a href="http://www.hello.com/" tabindex="1">Hello link</a>
<a href="http://www.foo.com/" tabindex="3">Foo link</a>
```

*Code Block 3*

If an element do not show up as a focused element, the `tabindex` tag can be used to index an element into the tab list (Connolly & Hoar, 2018).

**Semantics and assistive technology**

For all people who are able to see the screen they interactive, there are a lot of visual hints about what an element or object does. For example a button usually indicated visually that it is meant to be pressed, either by shadow behind it, gradient color which gives a sense of 3D-effect or just another color in contrast to the background. There are many ways of changing a button’s appearance to indicate it can be clicked. But for someone who can not see the screen, these style attributes are totally useless (Dodson et al. 2019). This is where semantics comes into the picture. In order for someone who cannot see the screen, there has to be some more information about a button than just the visual hints that can be caught by the eye. Assistive technology is technology that can assist users in different ways. These assistive tools are explained further down in the theoretical framework. For someone who cannot see the interface on a screen, it is important to make all information within a page flexible enough to be accessed programmatically by assistive technology. If done properly, the assistive technology helps users creating an alternative user interface that better suits that users needs (Kearney et al. 2019a). WCAG 2.1 states in paragraph 4.1.2 that names, roles and value can be programmatically set to be available to user agents, including assistive technologies (W3C, 2018c).

A screen reader reads out the name, role and value, but also the state of an element if it has one. The name calls out what one normally can read about a field, the role explains what kind of element it is, for example a radio button or a normal button, and the value tells what a user has chosen if there are multiple options to choose between. The state tells what it sounds like,
the state - if a radio button is selected or not for example. All of these informational parameters are called out by screen readers if semantic HTML is used. In cases when a button is made of a div element there is no information at all for a screen reader to access (Udacity, 2016a). This is why semantic HTML is extremely important and should be used when there is a given tag for an element. Images and graphics will never have appropriate tags describing the element more than just what it is. Here is the alt-tag of highly importance. Below is an example showing how the alt-tag should be used (Kearney et al. 2019b).

![Image 1, Airplane](airplane.jpeg)  

<code>
```html
<img src="airplane.jpeg" alt="An airplane standing on the ground">
</code>

**Code Block 4, appropriate use of alt-tag**

**Navigating content**  
When using a screen reader the order of elements is important. Similarly to the tab order explained, but this time it is the screen reader which decides the order of reading what is on the page. Therefore it is of highly importance to place things in a logical order on a page. A so called accessibility tree is what an assistive technology device, such as a screen reader, reads out from the Document object model (DOM). The DOM is a programming interface for HTML documents. It works as a representation of a page so other programs can change the structure of the document, the style and content (MDN Web docs, 2018). A simplification of the informational process is shown in figure 4 (Udacity, 2016b).

![Figure 4, how users retrieve information through screen readers (Udacity, 2016b)](image)

When using some kind of screen reader, the user can jump directly to desired part of the content through a web rotor, which displays the accessibility tree for the user. It opens up all
headings, links and other essential elements within a page. This means that headings, links and other element should be carefully labeled correctly. A link should tell by itself where it leads. “Click here”, is usually a bad example while “Go to product” is a much better descriptive link. “Link purpose” is actually stated in 2.4.9 in WCAG 2.1 (Udacity, 2016c).

WAI has made Accessible Rich Internet Applications (ARIA) to work as a complement to all other elements that cannot be managed with native HTML. What ARIA does, is that it allows one to specify attributes on elements which modifies the way an element is translated into the accessibility tree. A normal div tag will usually not be displayed in an accessibility tree, but if the role tag is added to it, it will appear in the accessibility tree. This is an example where the input tag should have been used since it fits better for a checkbox, but sometimes there are exceptions where this technique can be good practise. The black box is what a screen reader finds out. See figure 5.

There is also situations where a role of an existing element needs an extra explanation to clarify its purpose, even though there already exist a good, appropriate HTML element. In figure 6, a normal button element gets the clarification as a switch through the role tag. The aria-checked tag explains the state of the button which can only be set to true or false and results in checked or unchecked for a screen reader.

Another great practise of ARIA is when a button element is displayed as an image. The alt tag explained earlier in this document is only for the img tag. Aria-label can be used for the same purpose. See figure 7.
Lastly, the “aria-labelledby” tag explains the relationship between elements. If an element is related to the heading above, then it is helpful to say that this element belongs to this heading. It gives a better overview of how the content is structured for someone who cannot see the content. As an example, the heading is only bold and not marked up as a heading element. Since italic, bold and underlined text is not explained by a screen reader there might be cases where one need to specify that a text is related to another element. See figure 8 (Google Developers, 2019b).

**Visual assistance**

So far, all techniques mentioned are helping people that cannot navigate with a traditional mouse. But there are some things left to be mentioned for people who can navigate in a traditional way and can see the screen. Some people with reduced sight are still able to navigate as usual, but need high contrasts on elements in order to perceive information.

According to WCAG 2.1 (W3C, 2019) there are requirements regarding contrast ratio between text and background. A too low contrast among these makes it harder to read. A higher contrast benefits everyone and is highly recommended to use. There are simple tools within browsers inspector tool that can assure a great contrast is being used. Image 4 shows Google Chrome’s built in contrast ratio assistance. Text color and background color is picked and the tool specifies whether the colors has enough contrast according to WCAG standard AA or AAA (Google Developer, 2019c).
These techniques are just some out of many, but these are prominent, important to know and partly understand in order to get the whole picture of this report.

2.6 Assistive Technology

2.6.1 Developer perspective
Simulators and accessibility evaluation tools are tools that can help developers to design and code accessible websites. These tools can help developers test their projects, both during the process, but also in the end of the process of making a website to see if it meets required accessibility guidelines (Abou-Zahra, 2017).

Simulators
Simulators give the opportunity to view web through eyes of a person with disabilities. It is a good complementation or replacement of a test with a person with real disabilities. To perform a test with a real person is of course the preferred way of execute this kind of test. There are different types of simulators which detect various types of obstacles that can re-create difficulties for people with disabilities. These simulators helps to view your website with various simulated disabilities like visual impairment, hearing impairments, cognitive impairments or physical disabilities. It shows developers what a website could look like for a person with for example colour blindness, tunnel vision or dyslexia. There are also simulators that allows you to see your website in different screen sizes, browsers and operating systems. Some simulators are not only for helping developers to code more accessible websites, they also work as helping tools for people with disabilities (DIGG, n.d.).

Accessibility evaluation tools
Accessibility evaluation tools are programs that allows web developers to test web platforms and its level of accessibility. These are meant to check whether it meets standards and
guidelines or not. Accessibility evaluation tools can only work as a complementary help in the process of determine if a website is accessible. A human evaluation should also be made since there is a risk that the program might exclude things that a human eye would not (Abou-Zahr et al. 2017).

Abou-Zahra et al. (2017) also means that these tools have different features that helps both developers, content creators, quality testers and even end users. The features support accessibility guidelines, for example WCAG which a lot of tools uses as guideline reference when debugging pages for accessibility errors. There are different accessibility evaluation tools that can be combined depending on what you develop, in order to test it as much as possible wherever you are within the developing process. It also have features that tests the accessibility of different kind of formats, for example HTML, CSS or PDF. The automatically testing feature in many evaluation tools gives the opportunity to automatically test different parts of the web page depending on the tools capability. Some can automatically test a single page and some can test groups of related pages. There are important questions to consider when choosing what accessibility tool. Who is going to use the tool and what type of project is it? Some accessibility evaluation tools works better in various contexts than others. Sometimes tools which are able to test large websites with several pages are needed for larger projects. One also need to consider developers pre knowledge of accessibility because some evaluation tools requires different level of pre knowledge (Abou-Zahr et al. 2017).

2.6.2 User perspective

There are different helping tools for people with disabilities so that they can perceive information on the web easier, both assistive technologies and adaptive strategies. Assistive technologies are helping tools that makes it easier to use the web in form of softwares and hardwares. Screen readers, braille displays, voice browsers, screen magnifier are all examples of this. Adaptive strategies are strategies which people with disabilities can use to make their web experience more smooth. Examples of this is adjust to a larger font size, turn on captions etc (Abou-Zahra, 2017). All tools are mentioned to widen perspective of used external helping devices on the web.

**Braille display**

A braille display is a device one can connect to a computer in order to help people that have difficulties using an ordinary keyboard. With this device the user can type text, calculate and read what is visible on the screen (Abou-Zahra 2017). There are 8 braille input keys which combined includes all different keys that you can find on a traditional keyboard. While typing on the input keys, the inputted text appears below them in braille so it is easy to read for the user. The line of braille characters appears on the display by raised and lowered dots. These dots also give users the ability to read what is on the screen. The input keys are not available on all braille displays, some braille displays are just for reading. In that case there are just a line of dots that forms the interface and text into braille (HumanWareTechnologie, 2012).
Screen reader
Screen readers are helping devices in form of a software. It reads content from screens out loud for users and can also convert text into braille which can be read by braille displays. It also assists navigation on sites. The software of a screen reader communicates with the operating system to convert what is shown on the screen. Users can easily speed up, slow down or pause the voice that reads the text on screen. To make this work, websites needs to be developed to support screen readers. This is where the importance of developers becomes palpable. Without their knowledge and awareness of accessibility, the screen reader will not work as desired for those users who uses this kind of assistive technology. In order for a screen reader to tell users how the main structure of a website looks like, websites need to be developed to support accessibility. If it can not formulate the structure of a site, users can not navigate properly. Users are then forced to read the whole page from top to bottom in order to navigate on the site, which is a very time consuming process. If web sites supports accessibility, users can tell screen readers to list the main structure through the rotor. The screen reader can read out loud and users are able to click on desired destination. The same goes for content. Screen readers can list content headings which gives users a great overview of content on pages so one can easily jump to whatever heading that interests the user (TheDOITCenter, 2017).

Screen magnifier
Screen magnifiers offers the ability to magnify the screen. This makes it easier for people with partial visual impairment to see what is on the screen. Often the screen magnifier is in form of a software but can also be hardware adaptations as well. It can enlarge both text and images (Paciello, 2000).

Alternative keyboard and mouse
There are several different types of alternative keyboards. Previously, the braille display was introduced which is made for people who are blind, but there are others as well. Some have larger keys, others illuminated keys. Another one on-screen keys or single-key switches. There are also alternatives to using traditional mouses, for example joysticks, touchpads, trackballs, voice recognition or eye tracking (Abou-Zahra, 2017).
Eye tracking
Eye tracking is a hardware that can track the motion of eyes looking at a screen. By sending out an infra red light on the screen as well as taking pictures at high speed of the eyes, image processing algorithms will calculate the eyes position on the screen from details and patterns they can find in the pictures. This will make it possible to steer the mouse pointer by only changing the focus point on the screen with one’s eyes. This will also make it possible to click on items on the screen by blinking. Tools like this are often used by people with motor impairment. The world’s most used eye tracking device is a swedish made eye tracker called Tobii (Tobii, n.d.).

Keyboard navigation
Tabbing through websites by clicking on the tab key. This is a way for people having a hard time navigate through content via traditional computer mouses or a touch pads to move around (Abou-Zahra, 2017).

2.7 Laws and Regulations

2.7.1 Discrimination act
There are two kinds of discriminations, direct discrimination and indirect discrimination. Both are forbidden by Swedish and European Court. Direct discrimination refers to when a person with a disability gets disadvantaged in comparison with a person in the same situation but does not have a disability. An example is if a person is denied admittance somewhere because of sitting in a wheelchair. Indirect discrimination refers to when a person is affected by what is seen as a natural requirement or regulation, but disadvantages people with disabilities. An example of this could be if an unjustifiable requirement for a job that makes it much harder for a person with a certain disability, that can not fulfill this requirement, to get that employment (Jyrwall Åkerberg, 2015).

Jyrwall Åkerberg (2015) also means that another form of discrimination is deficient accessibility. This form of discrimination was added in 2015. It handles when there is disadvantages for people with disabilities in comparison with a person without disabilities in the same situation, because of the lack of accessibility. But also with considerations of the relationship between the operator and the individual, economical and practical conditions as well as other considerations that matter. Some necessary requisitions within the discrimination prohibition of the discrimination law within deficient accessibility is requisition omission and information. By omission means that either complete lack of accessibility or that the accessibility is not sufficient enough. Both law, regulations and what considers reasonable in specific cases, determines what obligations different actors in the society has. Within the information, requisition refers to the accessibility of information. For the public sector this is required by law. Overall though, there are extremely limited supplementary regulations on communication and information. Other areas of responsibility when it comes to requisition is that working for equitable actions for accessibility, even though there are no regulations, there are still a certain obligation to do it. However this obligation only requires smaller actions in that case. What is meant by smaller cases is not defined by the government. It is then a matter of legal practise (Jyrwall Åkerberg, 2015).
2.7.2 The new law about accessibility for digital public service

In 2016 the EU convention decided that the public sector within every country in EU will be forced by law to make their websites accessible. These requirements affected authorities, county councils and municipalities. It also affected some actors who were owned by the authority and private actors within public financials. The law has three main things that needs to be considered. First of all, the actors affected needs to adapt all their web platforms, applications and documents according to the WCAG 2.1 directives. Everything that reaches end-users as long as possible, for example documents that can reach end-users via third parties, if it is possible. The second requirement is that the end-users should always have the right to indicate inaccuracies and require adjustments related to the WCAG guidelines. And last but not least all actors affected by the law needs to account for how they fulfill the first requirement above. This account is called availability report and should also contain a link where the users can reach the comment field where they can comment if there is any issue, according to requirement 2 (DIGG, 2018a).

Even though the law is already up and running since January 1st 2019, the law has not really started to apply yet. New websites and platforms will be affected first September 23 2019. Already established websites will be affected a year after the new websites, in other words September 23 2020. From June 23 2021 applications within the public sector will be affected (DIGG, 2018a).
3. Method and Implementation

3.1 Research Design

According to Blomkvist et al. (2015) the model of how to make a problematization reachable is called research design. Case study is a common research design within the field of social science and it is the research design that is the most applicable to our study because it is a research design used when trying to understand a phenomenon that is complex. It is a research design that is used when it is almost impossible to catch all aspects of a phenomenon (Blomkvist et al. 2015). Our study was complexed because there are many different type of web agencies which has different type of customers. It is hard to gather all aspects of this problem. That is why this research design is most suitable for our study. When we conducted this research design, one or several explanans were studied. Explanans is being used to understand or investigate a phenomenon (explanandum). In this study the phenomenon refers to how web agencies work for web accessibility, how they implement it in their working process and what reasons there are to not work with accessibility. Explanans in our study refers to web agencies. Case study is a relevant research method for our study because it is used when the purpose of a study is to research, explain or describe something along with being open for new discoveries. Case study is also a research design that is often used for investigating a phenomenon that is based on reality because of the rich empirical data you get are better at grasping the complexity of reality. Which is necessary in our cases in order to understand web agencies way of working and their point of view on the importance of web accessibility. The rich empirical material which is normally collected in case studies also gives the opportunity to provide room for new discoverings (Blomkvist et al. 2015), which is highly important when looking at two of our research questions. What effective ways there are for improving web agencies way of working with web accessibility and what reasons there are for web agencies not to work with web accessibility.

The result of case studies can not be statistical generalizability, because looking at one or a few cases will not give an enough sampling to see clear patterns within the results so you automatically can apply it to other cases. The results within a case study can only be analytical generalizability and extrapolation (Blomkvist et al. 2015). That is why the results from this thesis is analytical generalizability. We will analyze our findings in the findings and conclusion chapter in order to see if they are applicable on other cases.

3.1.1 Scientific approach

According to Blomkvist et al. (2015) an inductive approach of the study is when the empirical data collection is not based on the theoretical framework but it is making use of it in order to analyze and understand the findings of the study. Instead of the study being based on the theory, it is based on the research questions. The empirical study can lead to changes in the theoretical framework since it is the empirical study that determines what should be in the theoretical framework. It should only consists of theories that are of use for the empirical study (Blomkvist et al. 2015). This study has an inductive approach and an iterative way of working, which means commuting back and forth between empirical study and theory. This will make sure to keep the theory updated to be relevant for the empirical data.
3.2 Data Collection

In order to get a contextual understanding of the subject, interviews with web agencies and one interview, including observation with a person with an functional impairment, was conducted. The interview and observation was part of getting better knowledge and collect better data in order to make the best possible study. It was conducted before all of the interviews with the web agencies in order to gain knowledge and insight of how a functional impairment affects web environments. The pre interview was made to get a better understanding of everyday life with an impairment in a web environment behaves and what assistive techniques could be used. In order to get better insight into these different tools, observations was conducted as well. The observation showed us how the assistive techniques worked in practise, how navigation through website worked and what difficulties might occur when doing so. The observation will be passive, open and qualitative. There will be no participation of the observers in the observation, therefore this will be a passive observation according to Holme (1997).

In this specific case, a blind person named Julia Lindahl was observed. As a natural part of the working process of this thesis it was important to first observe, identify and then pick out important subjects and questions that could help further in the investigation with the web agencies. No data from this interview and observation is presented within this report, but was only a foundation for making better interview questions for the agencies.

3.2.1 Choice of data collection method

Since the purpose of these interviews is to get a deeper and contextual understanding along with making room for new ideas and reflections, a semi-structured interview was conducted. We made an interview guide with mainly open-ended and some closed-ended questions. At some questions we listed follow up questions if we felt that we did not get enough answer from the first question asked. We were cautious with asking follow up questions too soon so they got to answer the first question before being interrupted in their own reflections or getting affected by us. Blomkvist et al. (2015) means that semi-structured interview gives the possibility to both steer the interview in a desired direction but also be able to have open ended questions. That is why these interviews gave qualitative empirical data in form of words. It also maintained the possibility for new ideas and new reflections (Blomkvist et al. 2015), which created the opportunity of getting inputs that were not expected from original expectations. The semi-structured interviews were conducted first and foremost at the web agencies offices in a separate room, one of them were conducted at a café and one of them at tehuset in Jönköping. All interviews were conducted in a quiet and calm environment in order to avoid as many distractions as possible.

3.3 Selection of Informants

From those eleven web agencies in Jönköping that was contacted through email, six of them wanted to be part of the study. The selection was not based on either the web agencies size, their clients or how well-established they are. The only requirement of the selection was that they worked with web development and were situated in Jönköping. Because of time pressure, the selection was somewhat based on convenience sampling which means that easy access has an impact on how the sampling was being made (Somekh et al. 2011). In this case
it was easier access to web agencies in Jönköping since we want to meet them in person as long as it is possible. To be able to meet as many web agencies as possible in person, the sampled agencies are the ones who answered our enquiry. According to Baxter et al. (2015) there are great reasons to conduct interviews in person, not over phone or via online chat. Engaging people over phone or internet can be hard and they might be distracted by other things during the interview (Baxter et al. 2015).

3.4 Research Ethics

According to Blomkvist et al. (2015) there are four different requirements within social science to follow when conducting a study that is stated by the Swedish Research Council’s principles of ethical research for the humanities and social science. The first one is the information requirement which means that all participants within the study have to be able to take part of information regarding what the study is about and its purpose. The second part is the consent requirement which means that they have been asked and agreed on being part of the study. The third one is the confidentiality requirement which means that all participating has the right to be anonymous and data collected should always be treated confidentially. Last but not least the good use requirement which means that the stated purpose of the study, is the only purpose one can use the empirical data for. All these requirements are about not letting anyone getting harmed by participating in your study (Blomkvist et al. 2015).

We have followed all of these national requirements. The first part of our interviews, as well as in the email with the request of their participation, was to inform about our study and its purpose as well as the purpose of requested interview. All of the participants have also agreed upon being part of the study and were okay with being mentioned by name. We let all participants, both Julia and the web agencies, to be anonymous if they would like to. Only one agency wanted to be anonymous, everyone else was fine being mentioned by name in the study. If the interview consisted of any further discussions beyond our questions, that material was not used. Only material which was relevant for the interview remained.

3.5 Method of Analysis

First of all we transcribed all the empirical material from the interviewing in order to more easily making a presentational summary of them as well as more easily being able to see patterns and analysing them in further steps. In order to analyse the empirical data we used the analyzing method thematic analyzing which is an appropriate method to use when having qualitative empirical data. According to Blomkvist et al. (2015) thematic analysis is an analysing method where you set up a set of categories that your empirical data will be organized in. These categories can look a bit different according to which type of thematic analysis you are choosing (Blomkvist et al. 2015). The type of thematic categorization method relevant for us is categorizing it ourselves after what categories that feels useful for the study when reading through the gathered empirical data. This categorization method worked best in this study because we wanted a wide spectra of empirical material that needed to be analysed because of our use of open-ended questions. Their answers varied a lot since the web agencies we interviewed were very different when it comes to size, clients, establishment and employees. After we decided which categories to use we wanted to organize our findings into the different categories that we stated. When doing reflective writing we wanted to
reflect upon each category individually. What could be said and found about each category and could it answer our research questions and purpose of this study. We worked inductively, which means that when we analysed our findings we went back and forth between the theory, findings and research questions. The categories we choose to analyse in order to be able to answer our questions was as follows.

- Practical examples
- Testing
- WCAG in project specifications
- Customer base affecting level of knowledge
- Knowledge about web accessibility
- Structure of the industry
- Resources
- CSR
- Dialog with customers
- Taking advantage of SEO
- Taking responsibility for accessible web.

After analyzing, we did a presentative writing of each category.

3.6 Reliability and Validity

Reliability and validity are criterias that states if a scientific work has quality or not. Reliability refers to whether you are conducting your study in the right way. Internet sources are not ideal for reliability (Blomkvist et al. 2015). Although, the majority of the used internet sources in this study has clear authors and are obvious actors within the investigated industry, like for example Google Developer, Digg and World Wide Web Consortium. The theoretical background focuses around the problematizations stated in the purpose and research question in order to build knowledge around the subject of this study. We have also made sure that all information presented in the theoretical background is relevant for the study, which entails that all unnecessary information has been reduced.

The interview guides of the conducted interviews are available in this thesis appendices to ensure transparency and reliability. We interviewed all web agencies in person which gave us the opportunity to interpret their answers along with their body language. Both of us were present on the majority of the interviews conducted in order to avoid interpretation problems. The risk of interpretation problems is that depending on the way each interviewer asks the questions it can lead to differences in the interpretation of the answers of the informant. But due to sickness, we both were not able to be present at every interview but we were both at the first interviews so when we were later on interviewing on our own we knew how we previously have asked the questions. We also sound recorded the interviews so we could go through the interviews afterwards to avoid different interpretations of the answers. We have also used clear terms within the questions to make sure they understood it in order to get relevant answers to all question. We also targeted each research question from different angles with different questions which ensures validity to the answers of those questions. This is, according to Svenning (2003), called method triangulation within the method.
4. Findings

4.1 Interviews

Information about the interviewed agencies are summarized in table 1. All agencies were given the opportunity to be anonymous. Agency number 6 did not want to present their name in the study. Further on this agency is referred as “Agency 6”. Number of employees and year of establishment are listed to give an indicator of the agencies magnitude. The more employees an agency has, the less important is the exact number of them. Therefore Knowit Experience and Agency 6 does not state the exact number of employees.

<table>
<thead>
<tr>
<th>Interview Number</th>
<th>Company Name</th>
<th>Number of Employees</th>
<th>Established (year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Toxic Interactive Solutions</td>
<td>28</td>
<td>1996</td>
</tr>
<tr>
<td>2.</td>
<td>Trafikbyrån</td>
<td>17</td>
<td>2008</td>
</tr>
<tr>
<td>3.</td>
<td>Knowit Experience</td>
<td>100+</td>
<td>1990</td>
</tr>
<tr>
<td>4.</td>
<td>Red Capes IT</td>
<td>9</td>
<td>2017</td>
</tr>
<tr>
<td>5.</td>
<td>Digitala Framsteg</td>
<td>3</td>
<td>2018</td>
</tr>
<tr>
<td>6.</td>
<td>Anonymous agency</td>
<td>100+</td>
<td>2000</td>
</tr>
</tbody>
</table>

4.2 Summary of Interviews

This section summarizes all six interviews which were conducted in swedish. The interview guide is found in the appendix 9.1. Some of the interviews went quite long and are therefore summarized with essential and relevant data. The summarized interviews are consequently not containing every single word said during the interviews.

4.2.1 Interview 1 - Toxic Interactive Solution

We interviewed Calle Andersson, who is project manager and business developer, together with Andreas Hoas who is digital art director with responsibilities regarding UX and UI. Andersson explains Toxic as a “full digital agency”, making projects on customers requirements. They build websites from scratch but also in CMS’s like Litium and Umbraco. Content can also be applied where they do social media, photography and much more. Toxic has not worked that much with clients within the public sector as they can list nine customers from the list of registered customers since its start in 1996. Hoas has heard about the new directives in smashing magazine which is a digital web developer magazine. Although none of them had discovered an intensified discussion or increased demand among their customers or colleagues within the industry. Within the private sector Andersson talks about that everything is about selling and making money. Toxic’s mission is to deliver what the customer asks for and then there is unfortunately not time to work with things which can not be paid for. “Although we should do what we can do,”, says Calle. He thinks that some responsibility lays on developers and agencies which has parts of the knowledge in order to
do something about accessibility. Thy can also present a broader perspective and remind the customer to be aware of all possible target groups and do not exclude anyone, but in the end there will always be the customer who decides what they should deliver. Toxic does not have any employee that only works with testing and evaluating, but they do have one person working with customer success in general. They try to involve the customer as early as possible to gain knowledge and discover mistakes during the project. Andersson and Hoas lists three main challenges for them when it comes to working with accessibility.

- Keep themselves updated on new standards and directives.
- Hard to get customers pay for it.
- Hard to motivate the need for the customer.

Andersson realises during the interview that they can improve several things in their mission of creating accessible web in a broader sense. As an effect of companies implement of Corporate Social Responsibility (CSR), more companies would consider their digital environments as a part of their CSR as well. Even Toxic can work harder on this by including questions about accessibility as a part of their list of questions when initiating new projects with customers. Andersson also sees a need of inform developers at Toxic to be more aware of guidelines like WCAG.

4.2.2 Interview 2 - Trafikbyrån

At Trafikbyrån we interviewed Filip Wessman who is a front-end, back-end and UX-developer. Trafikbyrån is a relatively small company but has grown a bit lately and today they are 17 co-workers. There are only 2 web developers on Trafikbyrån since their main focus lays more towards internet marketing rather than web development. The web development is more of a bio-effect for Wessman since they first worked only with digital marketing. As it was almost impossible to only work with digital marketing without web development involved he started to work more with web development. Trafikbyrån works with “half-sized” companies. Nowadays when there are a bit more employees, they have a selling part, developing/production part and a project management part of the company.

When speaking about the law Wessman says that they haven’t talked anything about it within the company, only that he has read some things just briefly regarding accessibility for the public sector. They rarely or never get questions about accessibility since they do not have the knowledge about it, Wessman says. And as far as he knows, there is not a requirement on accessibility for companies within the private sector. In order to offer customers these kind of extensions they need more time and money. There is a challenge of motivating for the customers why it is needed. But if you can motivate for clients with statistics that it is worth put money in, otherwise they would lose this and this many customers, Wessman says. He admits that Trafikbyrån has work to be done and knowledge to gain in this area. The overall responsibility lays on different parties depending on the size of the client and project. The large a company is, the more responsibility the company should have, and the smaller a client is, the more responsibility lays on the web agency to inform the client. However agencies should always mention it, but in the end the client have to decide whether the want to implement it in the project.

Trafikbyrån works with some accessibility techniques though. But like everyone else, it is more in SEO (Search Engine Optimization) purpose rather than accessibility purpose. Wessman means that if they could prove, by implementing SEO and accessibility, they show statistically analysis and bounce rates and such to prove for the customer that it is worth it.
Wessman continues with bringing up examples that could change the industry to the good. Likewise Google’s SEO rates are based on speed, responsiveness and similar they could include accessibility as a part of SEO rates. In that way it would be beneficial for all agencies and customers to support accessibility for the sake of publicity. He thinks that if google would ad requirements like this, there would be major changes within the industry and says that the pressure might would be on those parties that has this authority in the industry.

Wessman have never heard about WCAG. Guidelines he follows are the ones taught in school and things he catches up along the years. The only testing Trafikbyrån does in order to ensure websites works good is to put in a few hours of testing in the end of projects. They follow up bounce rates, alt-tags, pictures sizes and HTML5 tags.

Wessman summarizes it all by addressing some specific bullet points as main challenges.

- Customers willing to ad it within projects (pay for it).
- In order to get customers you have to cut prices as much as possible as a smaller agency.

However, Wessman ends up realising if you know how to develop for it by heart, there might not be that much of an extra cost. He compares it with responsiveness and tells that Trafikbyrå does not take any extra money for developing for mobile devices.

4.2.3 Interview 3 - Knowit Experience

Fredrik Hansson was interviewed at Knowit Experience in Jönköping. Hansson works as consult manager and have worked at Knowit Experience since four years back. He has also worked at Jönköping University as a lecturer and has educated students in the course Interaction Design where design for accessibility is a part of the learning outcomes. Knowit AB is a big IT consult company in Sweden, Norway and Finland. It consists of three part which are Experience, Solutions and Insight. Experience works primarily with web development including design, front-end, back-end, concept, pre-study and content providing. Many projects Knowit does are over handed projects where the website already exists, but has to be improved, reworked or optimized. They rarely make websites from scratch. The customer base relies more to the private sector, but they also do a lot of projects where the public sector is the client. It varies from small projects on about 200 hours, up to projects on over 2000 hours.

When Hansson knows WCAG well, but have not heard about the update version 2.1. WCAG is commonly used in project specifications and if customer do not ask for it, Hansson and his colleagues are putting it in the specification and discusses it with the client. Hansson says that many customers within the public sector are using WCAG AA as a requirement. Often they do not have a clue what it is about, more than that they know they have to include it because of the law. WCAG AA is a well established level of accessibility at Knowit, and many developers knows it more or less by heart.

Hansson talks further about the gap between content producers and web developers. Much of WCAG level AA requires knowledge on content level, for example color contrasts and alt-tags. He means that there is a responsibility of project managers to educate future content providers to be aware of things like this, otherwise it does not matter how many hours developers spend on making the rest of websites accessible. In order to test their websites they sometimes brought in Funka, which is an external accessibility consult, to make sure
projects meets specified requirements. It sets pressure on Knowit, and it gives them authority when they talk to the customer later on. Sometimes customers are not trusting Knowit in why certain things are important, and thanks to Funka there is easier for Knowit to motivate choices.

Hansson talks about the importance of making web accessible and enlights a quote from the book Don’t make me think by Steve Krug that says; “It’s the right thing to do”. It becomes much better for some, but a little bit better for everyone. Those arguments should be enough for customers to say yes to implementation of accessibility, means Hansson.

Knowit does not have anyone hired that works with testing only, and means that there is not work enough for that. At least not here in Jönköping. But as project manager he is usually part of the final testing before launch. It is usually great to involve a person that has less insight of the project than the ones who have worked with the project since its initiation. “After awhile you get “blind” on your own work”, Hansson says. As mentioned, Funka is good if the client wants to pay for it. Knowit never tests their projects with end-users and that is mostly because their clients do not want to involve their customers for different reasons. This is sad, says Hansson and admits that it would be very interesting and instructively to do so.

Hansson points out that the responsibility of increasing accessibility on the web never relies on those who needs it the most. Developers especially are the ones who can raise the question, even though it can be hard to get customers pay for it, he says. A motivating factor could be to mention that customers might leave your site and will never recommend it to someone else since it did not work with a screen reader for example. Also, there is not a high cost if it is implemented from the start. It is also good for SEO since Google looks for great markup and tagged images and figures.

Due to Hansson, Knowit can do better though. They are far away from perfect. Sometimes the lack of competence makes it hard to estimate the extra cost of making websites accessible and therefore it is left behind by customers in their projections. Knowit has to be even better when it comes to talk about accessibility in the early stage of project initiation. The discussion with the customer is crucial. If the cards are played right, the customer wants to add accessibility and that puts in more hours to the company, which of course is good.

When Hansson is asked to point out major challenges he gives us two main things.

- Lack of knowledge from our side.
- Lack of knowledge from customers side.

As agency they can never force customers to read and know more about the subject, but what they can do is to prepare themselves better for the future. Education for employees would be one alternative, says Hansson. All developers should be given some days of education at Funka for example. “Like you do in this research, we should meet someone who really needs these kind of methods and techniques to work.”, Hansson says and mean Julia from Synskadades Riksförbund.

Hansson has never heard of any CMS that supports accessibility more than others but gets excited when he realises a potential future market of such a CMS. If the law would be extended to the private sector, there will surely be updated versions or totally new CMS tools that helps developers develop in a smoother way than those which exists today. In that way, the price of making accessible web could be cut of significantly.
4.2.4 Interview 4 - Red Capes IT

We have interviewed Daniel Fransén, who is the CEO at Red Capes IT which is a web agency that was established as a stock company 2017. Fransén explains in the interview that Red Capes IT is a fast growing web agency that already in the summer of 2018 had expanded from being Fransén and his co-owner Linus to be nine co-workers. Fransén tells us that they do not only work with web development, they also works with system development, application development, SEO, Google ads, social media, video production, educations and lectures. Red Capes IT are divided into three different distributions, system developing, web developing and market, education and lecturing. There are no middle managers so the structure of the company is very flat. They have a wide customer base, both within public but mostly private sector. They work with all from big clients like Arbetsförmedlingen and Jönköpings kommun to the smallest single business owners. Fransén says that it is important for them to have the same approach nomather what the customer are buying or for what amount of money because they started working with really small projects from the beginning and they value their references. Fransén had not heard about the new law or the new directives. They have come across multiple language features and general functionality, but not for specific users with disabilities. The main reasons that Fransén thinks that this has not reached out to them properly is because:

- The industry is immature and it lacks of clear standards, all developers use different techniques.
- The debate has fallen behind GDPR during last year. It would be good having an authority for web development in Sweden. Politicians have too bad insight of the industry and it is moving too fast.

A possible solution according to Fransén might be bigger companies like google and facebook pushing the development for accessibility further. Fransén says that those three parts carrying the main responsibility for accessible web. First of all the authorities should set directives, second of all the hope of making business of accessible web in the business sector and last but not the least the the company’s corporate social responsibility. When testing Red Capes IT mostly test for UX/UI and SEO purpose. Sometimes they do testing with elderly and uses the test tool Screaming frog, which is used to improve SEO. Red capes IT’s challenges in working with accessibility is according to Fransén:

- Allocate time and resources. What should we do? Who should have the responsibility within our company?
- Dedicate someone in the company to accessibility.
- Bring a plan to the table and prioritize it in our everyday working process.

Fransén thinks that companies who will survive in 5 years are the ones who clearly takes social responsibility seriously, and act. It is a way of positioning themselves on the market.

4.2.5 Interview 5 - Digitala Framsteg

At Digitala Framsteg we have interviewed Simon Sleman who started Digitala Framsteg along with two friends, Alex and Axel, in January 2018. It is a web agency that works with developing websites, mostly front-end development, SEO and Google ads. Their customer base is mostly based in the region of Jönköping. Sleman has heard about the directives but not in detail and he has not felt that there has been any intensified debate about it. But he has
heard about WCAG and knows slightly what it is about. The only form of accessibility that Digitala Framsteg has worked with is multiple languages. Sleman says that the responsibility of web accessibility is carried by everyone. The web agency has the responsibility because they have the knowledge about it. They have to inform customers about the possibilities, and larger companies should be good examples of implementing accessibility. The customers have the responsibility because they decide whether they want to pay for it, which can be an issue because accessibility is not something that makes a visual difference to the website. Sleman says though that accessibility is a good way of positioning your web agency as a good choice for people with disabilities. Digitala Framsteg does not clearly work for accessible web, but they work with colour contrast, image descriptions, SEO. Sleman says that difficulties for Digitala Framsteg to work with accessible web is:

- Harder for small agencies to take these requirements into considerations. Because it is harder to get those big customers.

Sleman also tells that from his own experience that if he finds a website not elaborative enough and he will not find what he is looking for, he will leave that website. Which is interesting he says because that is what some people experience almost every time they are visiting a website because of their impairment. What Digitala Framsteg can do in order to be better at creating accessible web according to Sleman is:

- The more people talking about it, the bigger the demand will be.
- Accessibility has to result in business.
- Talk about potential range and stakeholders.
- Speaking to the customers about multiple language function, because then the gap to accessibility is not that big anymore and then it is easier for the customer to understand why and how it makes sense.

4.2.6 Interview 6 - Agency 6

We have interviewed two employees at Agency 6, who has worked there for two and five years. Agency 6 has several departments that works with different things. The two informants we have been talking to works in a team where they work with customers both within public and private sector, about 70% public and 30% private. Overall in the agency they have a customer base based on about 50% public and 50% private. They work with both developing and management of websites and intranet. They are both well aware of the new law and its requirements. They mainly found out about the new law because their customers within the public sector came to them because they wondered what is happening? What does this mean? Then they brought it up internally. But the informants also explains that before the new law came into force it was very hard to go through what the law would include, because the Swedish law has included more to the law than the EU regulation had. It was not clearly set yet before the new authority DIGG started. Now it is superclear what points to follow within the law requirements and there is information about how you check that you have followed them, both for customers and developers. Agency 6 have also made their own checklist to follow. They tell us that for them at Agency 6 it is a matter of quality following these requirements. They could see a change in the customers, within the public sector, awareness of these requirements about a half year ago, maybe a bit more. Before these were just requirements that should be followed now they must to be followed. Their customers within the private sector does not have the knowledge about these requirements. One thing that Agency 6 has noticed though in their customer base is that some of the global companies have a higher knowledge about this. For example like their customers within the private sector
where parts of the company are situated in Norway, they have a much higher knowledge since they have more strict requirements and for the private sector as well. There are some private customers that has reacted to the fact that these requirements might be affect some parts of the private sector as well and has some questions. The interviewed at Agency 6 thinks that it is sad that they do not care about it until it is a law. The two informants also says that in order to have an as big customer base as possible it is important to not exclude people with disabilities, because if they can not use the website they will choose a website they can use. By following the WCAG guidelines, that falls back on HTML5 standards, you also get a better SEO grade as well, because benefits this. That is good motivations for the private sector. At least within the informants team at Agency 6 everyone should have some minimum knowledge about this but they also have some persons that know more about it within both testing and developing that has the interest and learnt themselves about it. When it comes to testing they tells us that they have both an automatic testing and manual testing through a test group they have. It vary though according to the project and the client. Even though it is the customer deciding what to prioritize, Agency 6 says that we can only guide the best we can and in new projects show them their template of how the best way of doing it is. On the question of who carries the responsibility Agency 6 answered that it should be the same in the digital environment as elsewhere in the society were you can see accessibility everywhere you go. They think that the higher up from the authorities the better, as for example in Norway. It is also an ethical question where everyone carries the responsibility to think about these questions. They keep themselves updated both from their customers and other developers, intern knowledge is crucial. Agency 6 finds these things to be the biggest challenges of implementing web accessibility:

- Before the directives it was hard to determine the requirements.
- Sometimes it is hard to motivate for the customer, since there in 90% of the time no visual effect of the adjustments.
- Hard to explain for someone that is not technically interested or conversant within the subject. You have to be very pedagogical when talking to the customers and explain the situation a person with disability may face otherwise.
- We have to find demos that the customer can try and see why it is important to put a little bit extra.

Agency 6 also says that creating accessible web does not have to cost extra for the customer if it is created from the beginning within the project, the expensive part is when you realise it too late in the process or if you get a project allocated to you. This is a good motivator for the customers along with SEO grade becomes better, people with disabilities can use the website and you can positioning your company. What Agency 6 can do in order to be better at creating an accessible web:

- Knowledge can always be better. The knowledge can be spread even more within the different departments of the company.
- Maybe appoint a role that only has the responsibility of accessibility.
5. Analysis

Analyses are based on findings through a conducted categorization which is explained in section 3.5. Each research question is used as heading for you as reader to keep track of what analysis are related to what research question. Below each research question, all categories are listed as bullet points and after that analysed one at a time. Analysis are of course touching each other but are somewhat separated to get a more clear overview of what has been identified and analysed.

5.1 Research Question 1

How does web agencies priorities creating accessible web, by following existing guidelines and standards?

Time since establishment and size of agency are shown being clear factors that matters most in agencies level of adoption of accessibility and how it is prioritised. Following categories are identified to answer how accessibility is prioritised.

- Practical examples
- Testing
- Customer base affecting level of knowledge of accessibility
- WCAG in project specifications

Practical examples

The two largest agencies, Knowit Experience and Agency 6 were clearly those two who were most used to work with accessibility. They answered most of our questions regarding how they work in practice with accessibility. Alt-tags went without saying, importance of color contrasts and clear user interfaces. Carefully made markup with HTML creates a good accessibility tree which by some agencies were mentioned more as a part of their SEO processes. All agencies were aware of the importance of SEO and were therefore very carefully when it comes to HTML markup and optimizing it. The two largest agencies were motivating their work with HTML for making websites more accessible, while smaller ones realised during our interviews that the importance of great markup benefits both SEO and accessibility. Further on ARIA-labels were mentioned by Knowit and Agency 6.

Testing

Previous mentioned factor also affected how well agencies tested their websites from an accessibility perspective. All of them tested their projects according to meet the requirements for good SEO and UX. But the majority of agencies did not test the level of accessibility on their web sites. This was highly linked to the overall prioritization of creating accessible web, otherwise there was no need of testing for accessibility. For example Agency 6 had a department working with testing all different projects to see if they fulfilled different requirements. They also made use of automatically testing through the CMS Sitevision. Making use of automatically testing and accessibility evaluation tools are effective ways of testing, but you should never leave out human evaluation (Abou-Zahr et al. 2017). Knowit also tested their projects in order to ensure accessibility, often internal within the company or together with clients. Hansson at Knowit Experience said that testing with end-users would be very interesting, but it is often a cost issue or because of clients who does not appreciating involvement of end-users within the project.
WCAG in project specifications
As Wessman at Trafikbyrån said, one difficulty with prioritizing accessibility is that customers rarely brings it into project specifications. But since, as all of the informants said, the customers within the private sector does not have the knowledge enough about it and therefore does seldom require it, the risk might be that it never will be in their requirement specifications. Agency 6 stated that they had templates on how to suggest accessibility at an early stage of the projection. Hansson at Knowit said that WCAG AA is often written in their specification to the customers, if the client had not added it by themselves. But as consults, they only do what the customers wants them to do and therefore accessibility is sometimes left behind anyway.

Customer base affecting the level of knowledge of accessibility
One factor that clearly affected the prioritization of accessibility was the agencies customer base. For example Knowit and Agency 6 had a customer base that involved both the private and public sector. This made it inevitable for them not knowing about how to create accessible web in accordance to WCAG and the requirements of the new law. Accessibility had to be involved in projects they have. The other four agencies did not work as much with clients within the public sector, which also reflected their level of knowledge of the subject. Since the new law was set in Sweden, working with public sector requires knowledge about web accessibility. As Fransén at Red Cape said; “it is a good way of positioning yourself on the market”. Prioritizing and attach value of knowledge within the subject could possibly expand an agencies customer base.

5.2 Research Question 2

What could be reasons why web agencies are not creating accessible web?
A majority of the interviewed agencies worked rarely or not at all with accessibility. All agencies were aware of the possibility to do it, but all of them were not adopting it as a part of their working processes. The following three categories were found as key reasons to why agencies are not creating accessible web.

- Knowledge about web accessibility
- Structure of industry
- Resources

Knowledge about web accessibility
Knowledge is doubtless the primary factor to why web agencies are not working with accessibility. Not just their own knowledge, but also their customers knowledge within the area. Only two of six agencies had heard about WCAG before. However all agencies admits that they can do better within the area than they do today, where education and prioritization are essentials for future improvements. Several agencies also appointed customers lack of comprehension to pay for it, even though there were differences of opinions whether it is more expensive to develop for accessibility or not. In the projection phase many of the agencies put questions about whether accessibility is important for the customers at the end. This becomes problematic as customers often has stretched their limitations of what they are willing to pay for at this point. As known by now, 200.000 people in need of accessibility on the web are not always enough for customers to react, in order to accept the need in an agreement. Some customers were just too small to consider the need of it.
Structure of the industry
Another reason seemed to be how complex, unstructured and expansive the industry is. The fact that technology move forward fast is common sense and techniques within the industry are developing fast as well. None of the interviewed agencies knew about the latest version of WCAG (WCAG 2.1) which is also worth mentioning. Fransén from Red Capes IT means that there are standards for almost anything in other industries, while the whole web industry is a very non-standardized industry. As a result of this, all developers and agencies are working in different ways. They have no requirements to follow by law, until now in 2019 when the law about accessibility takes effect. Some of the agencies wanted to see more standardizations in order to make the industry more structured and robust.

Resources
About resources, there were different opinions. Knowit and Agency 6 talked about the importance of implement accessibility in the initiation of projections, but also Andersson at Toxic saw the advantage of this. None of the smaller agencies talked about this which is interesting. There seemed to be a connection between level of knowledge about accessibility and the estimated price on implementing accessibility as a part of projects. The higher knowledge, the lower price agencies talked about making a website accessible. In that way it is definitely not impossible for smaller agencies to work more with accessible web, since it is not directly connected to the economic circumstances. No, it is not free to educate employees, but in the long run it can be crucial for survival of the market, as Fransén from Red Capes IT mentions.

5.3 Research Question 3

What can be effective ways for web agencies to implement accessible web directives as a part of their daily operations?

So, by now it is interesting to see how web agencies can work to improve their working processes to better support accessibility on the web. Following four categories were identified.

- CSR (Corporate Social Responsibility)
- Dialog with customers
- Take advantage of SEO (Search Engine Optimization)
- Take responsibility for accessible web

CSR
As mentioned, CSR came up as a subject in the interviews with Toxic and Red Capes IT. Especially Fransén talked about this as a factor of surviving the future environment within the web development industry. Customers are more aware of what and how they consume and buy things today, and as a result of this CSR has become more important for companies to consider (CONE, 2017). This is relevant within this industry as well. Web agencies can use pitches for clients to gain CSR to themselves, but also offer customers the possibility to take their responsibility as well. A win win situation all web agencies should consider.
Dialog with customers
As the study made by Harper & Chen (2012) shows, there is an increase of words connected to accessibility on the web over time. But in order to gain the actual presence there is a lot of work left to be done. And it will never end. Therefore it is important to come up with more ways of motivating the need of accessibility. With the right knowledge, agencies will be able to inform the customers better. That starts, as mentioned, with more knowledge for developers and especially project managers who can motivate the need for customers better.

Take advantage of SEO
It might sound a bit unethical, but another interesting aspect is that, as mentioned by three agencies, if accessible web could be a clear way of making business. Then it would be a big motivational factor for agencies customers. Because that is what their customers have in mind; making profit. As Wessman at Trafikbyrå mentions, there are interesting aspects when thinking of Google’s power and authority in the industry. If they could end up forcing companies indirectly to work with accessibility through defaulted publicity and lower rating scores in searches if sites are not optimized for accessibility, there could be real changes on the market. The importance of SEO seemed to be very high in a majority of the interviews and that is a result of Google’s indirectly forces in the industry. In that way, agencies could use accessibility and SEO in a combined package to present for customers. Can be sold as “one comes with another”.

Take responsibility for accessible web
One identified problem was that almost every informant, more or less, thought that the responsibility is partially on their clients, because of the inevitable factor that they, in the end, are the ones making the final decisions. All agencies involved in the study implied that their customers, at least within the private sector and especially smaller companies, does not have enough knowledge about web accessibility. This is interesting because without knowledge about accessibility, it will be hard to require it. However, all informants said that it is a responsibility on themselves as an agency to highlight these question in their projections and that there is always room to get better at working towards accessible web. Sleman at Digitala framsteg mentions that since the web agencies knows how to do it, parts of the responsibility relies on agencies.

Fransén at Red Capes IT as well as Andersson and Hoas at Toxic also meant that there is a certain social responsibility to take regarding these questions. Two of the agencies thought that an effective way of getting people to start prioritizing web accessibility is requirements from higher instances like authorities. This may happen in the future by an expansion of the law about accessibility for digital public service by covering parts of the private sector as well, according to Schultz (2016). One of these also said that it is a shame that this is what is needed for something to happen, because it is also an ethical question. As Hansson from Knowit said, “it is the right thing to do”.

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6. **Discussion and Conclusions**

6.1 **Discussion of Method**

A qualitative study was an obvious choice since we wanted to make room for the informants own reflections within the subject and new discoveries. Semi-structured interviews was the most suitable for us since our purpose of this study was to investigate something in a more reflective way and be able to understand the subject in depth. The interviews resulted in data that clearly described if and how they work for web accessibility along with difficulties why some do not work with web accessibility and solutions to why they should. The mixture of open and closed questions has given a comprehensive understanding of their perspective of this problem of web not being sufficient enough. We contacted eleven web agencies in Jönköping and six of them replied and said they could be part of the study. Although we only got in contact with six web agencies, they were all different in size, establishment, customer base etc. The establishment of the interviewed web agencies was everything from about one year within the industry to about thirty years within the industry and everything from three employees to 100+ employees. This gives the sampled group of interviews a good variation and different point of views in their answers. The interview guide conducted is as said of a semi-structured kind, it is not too extensive and the interview has been flexible for example let the informant answer even though they have come in on another question, so we let there be room for reflections and so they did not feel restricted. As long as we felt that all questions had been answered enough in the end. All except one informant has been okay by being mentioned by private name and company name which was good for the reliability of the study.

One critical issue of the interviews was the fact that when we contacted the web agencies to see if they wanted to take part of this study, we were not able to ask for a certain employment role of the informant because each web agency is so different in size and organizational structure. Therefore the web agencies let us talk to who they found the most suitable for this type of interview as representation for their agency, which might have affected what type of answers we got on different questions. We have talked to all from web developers to project leaders to CEO’s. As a result of this, everyone in that web agency did not necessarily had the same knowledge about web accessibility consistent throughout the company, because this was only a representative role of that web agency.

We also wanted the possibility to interview more web agencies. Because of convenience sampling, the conclusions of this study is not generalizable applicable on the industry as a whole in Sweden. It only represent a part of the industry of Jönköping, but can however give somewhat representative indicators of how it works in Sweden in general.

6.2 **Discussion of Findings**

Here we discuss our findings. The discussion puts light on and clarifies following conclusions drawn out of the whole study. By reading our findings over and over again, by discussion among two two of us behind the study and through reflections of our analysis we have came to these opinions and thoughts.
6.2.1 Research question 1

**How does web agencies priorities creating accessible web, by following existing guidelines and standards?**

All techniques we expected agencies to use, were used but only by two out of six agencies. Knowit Experience and Agency 6 differs from the rest of the agencies. It seems to be an obvious relation between number of employees and how aware of the subject agencies are.

Another surprising fact was that none were using test persons that has real disabilities. Test groups were formed, either by seniors, intern people or be external test groups like Funka, where Funka probably was the best test reference. In all kind of product development it is crucial to understand your users. Because of different reasons addressed in 6.2.2, disabled people seems to be too few and not worth the needed effort. We think that it is impossible to fully understand how web accessibility works without seeing how it works live when someone who is dependent of accessibility uses a website. After meeting Julia at Synskadades Riksförbund we gained knowledge and realized the importance of this subject.

As probably understood by now, Knowit Experience and Agency 6 were different than the other agencies. It was interesting that the customer base reflected how much the agencies knew about accessibility. That could be seen as a possibility for agencies who are not working with accessibility today. New potential customers are waiting around the corner if they could offer great accessibility as a part of their development.

By including WCAG in project requirements, it becomes clear for everyone what a website should achieve. The agency knows what to develop for, the customer knows what they can expect and the end user who is dependent on this becomes satisfied. Just as well as responsiveness for mobile devices goes without saying in projections, we would like to see a big push for accessibility as a natural part of web projects. It is not rocket science to do better, it is just about a small amount of effort to understand how to accomplish it and make it into routines.

6.2.2 Research question 2

**What could be reasons why web agencies are not creating accessible web?**

The knowledge of the new Swedish law, the WCAG guidelines and web accessibility overall varied a lot, which was somewhat expected, but not at this extent. We could clearly see connections between customer base and knowledge, it was one of the most obvious connections to increased knowledge. As well as the year of establishment of the web agency, although it was not an equally clear connection as the connection to the customer base, because some of the newest established companies did know about the guidelines and requirements although they did not use them within their working process.

Another interesting thing we got from the interviews, that was not expected by us authors, was the aspect of the industry’s role for web accessibility. That the industry overall was referred to, by some of the informants, as a bit immature and unstructured compared to other industries.
Resources will always be one of the collateral facts for web accessibility, because it is a service that someone decides to buy or not. But something that we wound interesting is that because of this inevitable fact, we saw the importance of expressing this issue and the solution of accessibility early for the customers. Something that the majority of the informants said was that a difficulty for the customers is to pay for something that they can not see and has no visual effect on the website. There are only a few parts of web accessibility that you can actually see as a user, for example color contrast. A lot of web accessibility are invisible for the users, like alt tags etc. But the bigger agencies interviewed that works with web accessibility mentions more or less that it is all about implementing accessibility and motivating it for the customers from the beginning. It becomes more expensive if you should correct it afterwards.

6.2.3 Research question 3

**What can be effective ways for web agencies to implement accessible web directives as a part of their daily operations?**

A brilliant suggestion of incorporating accessibility as a plan of both agencies and agencies customers CSR plans was discovered in this study. Web agencies should develop their CSR’s and take a bigger responsibility towards their customers. By having the dialog and discussion about accessibility with customers, agencies are doing what they can to support others CSR. Accessibility should come up in the beginning of projections, not the end. We think CSR will be even more popular and important within the next few years. Agencies should also consider whether they want to develop only for business, or can it be combined with developing for good sake?

Making business of web accessibility could be a motivational factor for web agencies. Even though we think that it should not be necessary to have business as a motivating factor for creating accessibility, out of something that should be a matter of course and the right thing to do, it is an inevitable factor. By making business out of web accessibility, this could be a bigger prioritization from customers side. If Google were to add a standard for web accessibility in order to get a higher SEO rate, we would see more accessible websites pretty soon. If web agencies could argue better for web accessibility, according to what Agency 6 said about motivational factors for customers, they would get a bigger customer base. The study by CONE said that customers are more aware of what and how they consume and buy things today, and as a result of this, CSR has become more important for companies to consider (CONE, 2017). Customers in the latter can both refer to the web agencies customers and the customers of the web agencies customers. That is good motivational factors for the web agencies customers within the private sector.

As we noticed, there were different opinions about the responsibility of accessible web. If web agencies start focus on what their part of responsibility is, there will be more accessible websites out there in the end. One possible solution for this could be to select one person at the web agency that is responsible for web accessibility. But as Agency 6 said, it is a matter of resources. This person might have to be educated within this area of expertise or they might even have to hire another employee because of the workload being to extensive on that person. But if all parties in development of web, from developers to customers, took equal responsibility, we would get a more equal society. Authorities could expand their directives,
web agencies should widen their knowledge and web agencies’ customers should consider their priorities.

6.3 Conclusions

Conclusions of this study were brought from findings, through analysis and discussions.

How does web agencies priorities creating accessible web, by following existing guidelines and standards?

- No unknown methods or techniques were discovered along the study. The study became more instructively for some agencies, than it was informational for us during the execution.

- Web agencies in Jönköping were surprisingly bad at working with accessibility. Some were better, but overall bad. For some agencies that are nearly start-ups, it is of course understandable to not have covering knowledge, but for most of them there are no excuses to not start a new era.

- None of the agencies we were in touch with had ever worked in collaboration with someone who actually is in need of accessibility on their final products - websites.

What could be reasons why web agencies are not creating accessible web?

- Lack of knowledge about web accessibility became by far the main reason for not develop for accessibility. With just a bit more knowledge there are great possibilities for all agencies to become heroes for disabled people with special needs on the web.

- An immature and non-standardized industry could be reasons why everyone had works in different ways. With more clear directives from governments, working processes could be similar no matter for what web agency you work. Standardization for accessible web should definitely be a matter of course.

- Not surprisingly, resources in form of economy is also a reason. It turns out to be hard for agencies to motivate customers to pay for accessibility. However, the motivation process with customers is rarely supported by enough knowledge and leads therefore to insufficient arguments which does not motivate customers enough.

What can be effective ways for web agencies to implement accessible web directives as a part of their daily operations?

- Include web accessibility as a given part of CSR plans on both agencies side, but also motivating it for customers. The importance of a mature dialog about it is crucial for survival of accessibility.

- Take advantage of SEO when having dialogues with customers. Accessibility can be sold together with SEO as an effective, beneficial alternative for customers.
● All parts of a development process should take their responsibility. Everyone can participate in the journey towards a more equal society.

6.3.1 Limitations of the study
One of the major limitations to this study was that due to the short period of time, there was no time to enter the industry in other cities than Jönköping. Almost all of the interviewed agencies, solely has offices in Jönköping. Final results and findings should therefore not be seen as representative for the industry as a whole in Sweden. Though, it will give a somewhat good indicator of how agencies work with accessibility questions and directives.

6.3.2 Future research
Suggestions of future studies could be to investigate people with disabilities point of view of this subject. As we saw there were none of the agencies who worked in collaboration with users in need of accessible websites, it would be very interesting to make research about specific problems that occured for those in need of accessibility.

Also, this study only investigates desktop versions and there are surely more to investigate about accessibility on mobile devices.
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8. Appendices

8.1 Interview Guide for Agencies

1. Introduction
   ● Presentation av oss.
   ● Vill du vara anonym eller får vi publicera namn och företagsnamn?
   ● Är ni okej med att vi spelar in intervjun?
   ● Presentera vårt arbete och dess syfte.
   ● Presentera syftet med intervjun.

2. Warm-up
   ● Kort presentation av dig själv och vad du jobbar med.
   ● Berätta kort om företaget du jobbar för.
   ● Hur gammal är byrån du jobbar för?
   ● Vilka kunder har ni?
     ○ Typ av jobb? (Exempel: Webbplats, e-handel, intranät, webbapplikationer)
     ○ Hur mycker kunder har ni privat vs. offentlig sektor?
   ● Hur ser företagets struktur ut och vad har ni för olika roller?

3. Body of session
   General:
   ● Har ni hört talas om de nya direktiven för offentlig webbtillgänglighet?
     ○ Ifall inte; I oktober 2016 beslutades det på EU-nivå om att göra webb mer
tillgänglig i offentlig sektor. I Sverige trädde dessa nya direktiv i kraft 1 januari
2019 och innebär kortfattat följande:
Myndigheter, landsting, kommuner. Ska så långt det är möjligt utforma
webbplatser som är enkla att uppfatta, hanterbara, begripliga och robusta.
https://webbriktlinjer.se/lagkrav/webbdirektivet/
   ● Har ni märkt av en intensifierad debatt i branschen i och med de nya direktiven?
   ● Har ni jobbat mer konkret med tillgänglig webb tidigare?
     ○ Berätta om dessa kunder och projekt.
   ● Efterfrågar kunder tillgänglighet eller är detta något ni erbjuder?
   ● Tänker ni olika beroende på om ni utvecklar för privat vs. offentlig sektor och i så fall
på vilket sätt?
   ● Har ni någon ansvarig på företaget som jobbar specifikt med tillgänglighet eller jobbar
alla med det?
     ○ Är det en given del av er arbetsprocess?
       ■ Varför/varför inte?
   ● Vem tycker ni bär ansvaret att öka tillgänglighet på webben?
     ○ Webbbyråer, kunder(företag) eller de “utsatta”?
     ○ Efterfrågan kommer alltid vara låg. Är det ett argument för att inte skapa
tillgänglig webb?
Technical part:

- Vilka är era primära fokusområden när ni utvecklar för tillgänglighet?
  - Vad är det ni utvecklar som gör innehåll mer tillgängligt?
  - Vilka labels, metoder, etc. aria-labels, tab, strukturer, semantics, markup, focus?
- Vilka guider och riktlinjer följer ni för att skapa tillgänglig webb?
- Hur gör ni för att hänga med i utvecklingen av nya riktlinjer som tas fram?
- Hur säkerställer ni att era lösningar fungerar?

4. Summary

- Om inte tillgänglighet kommer på tal med kund, behandlar ni då kunder olika i tillgänglighetsperspektiv?
- **Vilka svårigheter och utmaningar ser ni som företag med att jobba med tillgänglighet?**
  - Har det alltid varit självklart att jobba med tillgänglighet? Varför?
  - Kan ni märka av en utveckling senaste åren och att debatten kring tillgänglighet har ökat? På vilket sätt?
  - Är det en kostnadsfråga att skapa tillgänglig webb?
    - Bo som växer. Har inte kommit upp på tapeten tidigare, men kommer definitivt göra det framåt.
- Hur stora summor pratar vi när det gäller att skapa/inte skapa tillgänglig webb?
- Hur kan ni bli bättre på att jobba med webbtillgänglighet?
  - Konkreta exempel?