



THE EFFECTS OF WEBSITE INTERFACE ON SEARCH ENGINE OPTIMIZATION AND USER EXPERIENCE

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Maria Huhtala

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Tekijä Maria Huhtala

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Ohjaaja Lana Beikverdi

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Tämän opinnäytetyön toimeksiantajana oli Hämeen ammattikorkeakoulu. Opinnäytetyön tavoitteena oli selvittää ylemmän ammattikorkeakoulutukinnon, Johtaminen kestävässä liiketoiminnassa, verkkosivun nykytilaa, käyttöliittymän vaikutusta käyttäjäkokemukseen ja hakukoneoptimointiin ja lopuksi tehdä parannusehdotuksia.

Tutkimuksessa käytettiin laadullista ja määrällistä tutkimusmenetelmää. Laadullinen tutkimus toteutettiin haastatteluilla. Määrällisessä tutkimuksessa aineisto kerättiin ajamalla verkkosivulla Google Lighthouse -raportti. Haastatteluista saatu aineisto analysoitiin sisällönanalyysimenetelmällä. Google Lighthouse -raportin pohjalta tehtiin auditointi, jossa analysoitiin nykytilaa. Haastatteluiden ja Google Lighthouse auditoinnin pohjalta esiin nousseista kohdista tehtiin parannusehdotuksia.

Tutkimusten tulokset osoittavat, että verkkosivun yleinen tila on varsin hyvä, vaikka myös parannettavaa löytyi. Käyttöliittymän rakenteella ja muotoilulla on vaikutusta käyttökokemukseen ja hakukoneoptimointiin. Tutkimuksessa nousi esiin erityisesti verkkosivun visuaalisuuden, rakenteen ja navigoinnin vaikutus käyttökokemukseen. Negatiivisina asioina tutkimuksissa nousi esiin, että sivu koettiin liian pitkäksi. Mobiilinäkymä koettiin tietokoneen näytön näkymää helppolukuisemmaksi.

Tutkimuksen johtopäätökset antavat parannusehdotuksia verkkosivulle, jotka pohjautuvat tutkimuksista saatuihin tuloksiin. Parannusehdotukset toteuttamalla sivun käyttökokemusta ja sijoitusta hakukoneessa saadaan parannettua. Jatkotutkimuksia toteuttamalla on mahdollista saada syvempää tietämystä verkkosivun tilasta.

Avainsanat Hakukoneoptimointi, Käyttäjäkokemus, Käyttöliittymät

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Author Maria Huhtala

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Supervisors Lana Beikverdi

Abstract

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This thesis was commissioned by Häme University of Applied Sciences. The aim of the thesis was to find out the current status of the website of the Masters degree programme, Management in Sustainable Business, the impact of the user interface on user experience and search engine optimization, and finally to make suggestions for improvement.

The research used a qualitative and quantitative research method. Qualitative research was carried out with interviews. In the quantitative study, the data was collected by running the Google Lighthouse report on the website. The material obtained from the interviews was analysed using the content analysis method. Based on the Google Lighthouse report, an audit was carried out, which analysed the current state. Based on the interviews and the Google Lighthouse audit, suggestions for improvement were made.

The results of the research show that the overall state of the website is quite good, although there was also room for improvement. The structure and design of the user interface has an impact on the user experience and search engine optimization. In the study, the impact of the website's visuality, structure and navigation on the user experience came to the fore. As negative things, the surveys showed that the page was perceived as too long. The mobile view was perceived as easier to read than the view on the computer screen.

The conclusions of the study give suggestions for improvement to the website, which are based on the results obtained from the studies. By implementing suggestions for improvement, the page's user experience and ranking in the search engine can be improved. By carrying out further research, it is possible to gain deeper knowledge about the state of the website.

Keywords Search engine optimization, User experience, User interface

Pages 38 pages and appendices 3 pages

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1 Introduction

The Internet is a huge repository containing a large amount of information. Search engines have been developed to help users find the information they are looking for online and to facilitate the management of this amount of information. Statistics from Statista show that searching for information is the main reason for using the internet in the 16-64 age group, regardless of their age (*Main Reasons for Using Internet 2022*, 2023). When a user starts looking for information, and user do not know URL most likely user goes to the Internet and asks a question from a search engine. Egri and Bayrak (2014, p. 336) say that over 90% of web traffic comes from search engines. Web pages are the very first sight a seeker sees when looking for information from a thing, a company or organization. The web pages are like a business card to any kind of and a size of company or organization (Clay & Jones, 2022, Chapter 1).

The web pages usability and accessibility are strict line with a user experience, satisfaction, and success. The site's ranking and success in search engines is important in terms of the site's visibility. No matter how good and polished the site is, it is of minimal use if no one knows it exists. In order for the page to be found in a search engine, search engine optimization is needed. (Suomen digimarkkinointi Oy, n.d.)

The educational organizations website is an important marketing tool, through which the school can make educational programs, teachers and what it's like to study at the school visible to the applicant. Educational organizations websites play an important role when students are looking for a suitable place to study. There is fierce competition for study places, but schools also compete for students. The opportunities offered by the school must meet the student's values and wishes. (Jetsu & Manninen, 2022)

Mogaji (2016) says in his research that prospective students who are disappointed with the website of an educational organization easily associate their experience with the entire organization, quality, and operations. According to Mogaji's research, the experience of using websites can have an impact on future students image of the entire educational institution (Mogaji, 2016).

The aim of this thesis is to find out what kind of affects the website user interface has on user experience and search engine optimization and how they are related to each other from the point of view of the educational organization. User experience affects search engine

optimization and search engine ranking. A better ranking in the search engine brings more traffic to the website (Clay & Jones, 2022, Chapter 1). A good user experience makes website visitors stay on the page longer and come back again (Nielsen & Loranger, 2006, Chapter 2). A positive user experience, on the other hand, is influenced by the website's user interface, which is used to build a usable page (Kuittinen & Jääskeläinen, 2022).

1.1 Research questions and sub-questions

The research starts with clarifying the research questions. The research question directs the research in the desired direction and points from which angle the topic is approached. The research question can be supplemented with sub-questions, which can be used to dig deeper into the topic and break the whole into more manageable parts (McCombes, 2022).

In this research, with the help of the research question, the author finds out how the user interface affects search engine optimization and user experience.

The research question for this thesis is:

How does website interface effect search engine optimization and user experience?

With the help of sub-questions, author aim to outline the course of the research and make the research easier to understand. The sub-questions point the way to the main question.

The sub-questions are:

How does the design of the website's user interface affect search engine optimization?

How does the design of the user interface of the website affect the user experience?

How do user experience and Search Engine Optimization relate to each other in the design of a website's user interface?

1.2 Comissioning company

HAMK is Häme University of Applied Sciences, owned by the cities of Forssa, Hämeenlinna, Riihimäki and Valkeakoski and the municipalities of Hattula and Tammela. Since 2015,

HAMK has been in the form of a limited company whose operations are divided into education and research units. HAMK offers education in seven fields of study, 39 degrees, in 7 locations. HAMK's main campus is located in Hämeenlinna. (*Häme University of Applied Sciences, 2024*)

The commissioning company of this research is HAMK. The purpose is to find out how the website interface affects user experience and search engine optimization from educational organization point of view. In this work, the current status of one of HAMK's webpages, the webpage from master's degree program of management in sustainable business is evaluated and an SEO strategy with examples is made to improve visibility and to reach the desired audience.

2 Theoretical Framework

2.1 User Interface

There are several types of user interfaces. There are user interfaces controlled by voice commands (VUI), gesture-based interfaces, graphical user interfaces (GUI) and text-based user interfaces (CLI) (*What Is User Interface (UI) Design?, 2016*). User interfaces can be mobile or computer applications, programs, or websites. In this thesis, we focus on the user interface of websites.

The user interface is the visible part to the user of a program, application, or website. With the help of the functionalities of the user interface, the user interacts with the application, software or website. (Galitz, 2007, Chapter 1)

When we think about the user interface, its user is at the center of everything. When designing a user interface, it is important to find out for whom the user interface will be made. By defining and identifying the "dream user", a context for the interaction between software and people is created for the user interface. Human and software interacting are like having a conversation with each other. The user writes text or presses an icon, and the program responds in a predefined way. The operation is not one-way, and the user needs feedback from the program about the commands he has made, i.e. speaking, so that the user knows that the program has understood what the user wants to do. The purpose of the user interface is to help the user achieve their desired goals. (Tidwell et al., 2019, Chapter 1, Know Your Audience)

The functionalities and requirements of the user interface must correspond to the skill levels of the user. If the user interface is too simple and does not meet the user's wishes, the user may feel frustrated and abandon the software because of it. The other hand is that if the software offers too many options and is complicated in this case, the user gets frustrated with the software's requirements and his own lack of abilities. (Tidwell et al., 2019, Chapter 1, Skill Level)

The user interface is important from the point of view of search engine optimization. The technical features of the user interface can be used to improve the visibility of the site in the search engine. In the Google search engine, the most important optimization step is that the page is indexed for a mobile device. Google has stated that it is the most important ranking factor in the search engine (*Mobile Site and Mobile-First Indexing Best Practices*, 2023). According to Google, more than 60% of searches are made on a mobile device (*Maintaining Your Website's SEO*, 2024).

In addition to responsiveness, other important ranking factors for Google that can be influenced by optimizing the user interface are the page experience signals Core Web Vitals, which are Largest Contentful Paint (LCP), Interaction to Next Paint (INP) and Cumulative Layout Shift (CLS). These metrics measure page load performance, interactivity and visual stability (*Understanding Core Web Vitals and Google Search Results*, 2024). Loading performance (LCP) tells how fast the page loads. A faster loading time increases the user's satisfaction with the user experience. In order for the user to have a good user experience, the time should be less than 2.5 seconds (Walton & Pollard, 2024). Interactivity (INP) tells how quickly the site responds to actions taken by the user, for example by opening a menu. A low value indicates that the page responds to the user's actions quickly. A good reaction time is less than 200 milliseconds (Wagner, 2024). The Cumulative Layout Shift (CLS) metric means about the visual stability of the page. The stability of the site's layout is important so that the user does not have to experience phenomena that negatively affect the user experience, such as text jumping or changes in the positions of elements. The limit for a good user experience is less than 0.1 points (Mihajlija & Walton, 2024).

Website structure and navigability are factors that can affect search engine visibility and user-friendliness. Clear navigation and page structure increase search engine visibility when Google's crawlers get to the site and can read it. Clear navigability and page structure also increase user experience and improve the page experience. (*SEO Starter Guide*, 2024)

2.2 User Experience

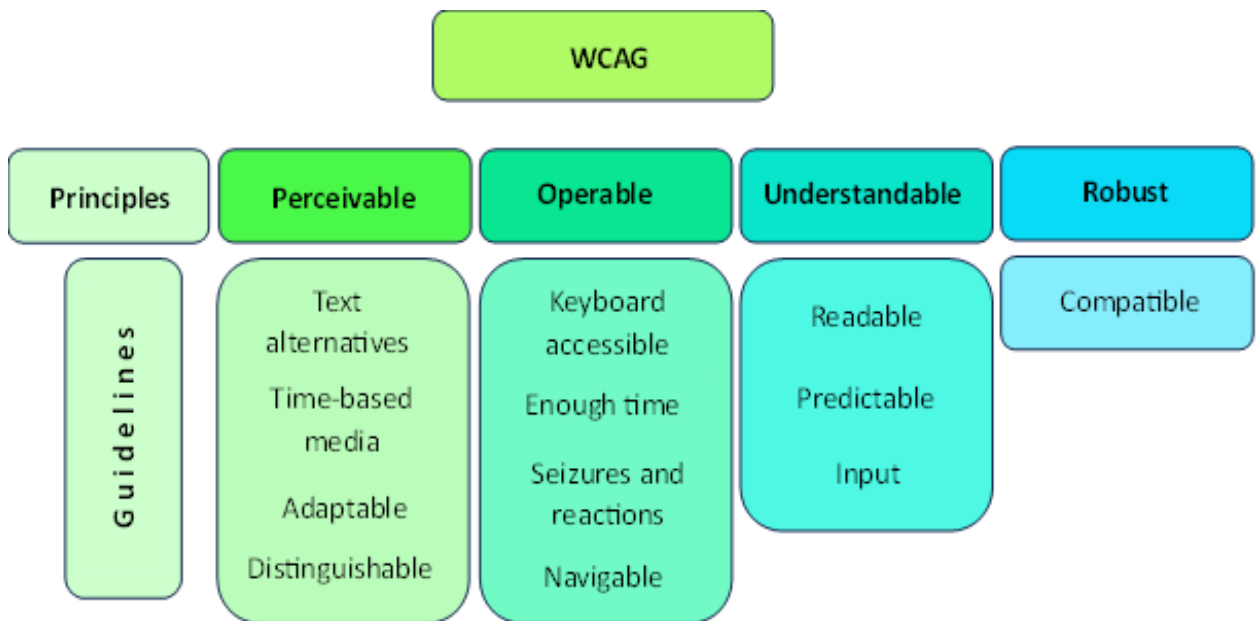
Usability and user experience go hand in hand when talking about user experience. However, before usability comes accessibility, which in many respects coincides with usability. Accessibility means that a user looking for information on the site can find the information they are looking for on the site, usually without much effort. A situation where a site is accessible but still difficult to use is possible. In this case, the site is not usable. When the site is accessible and easy to use, it can be said that the site is also usable. (Selovuo, 2020)

2.2.1 The web content accessibility guidelines

To guarantee accessibility, organizations and experts have defined accessibility principles, by following which developers can build pages that are accessible to everyone. The web content accessibility guidelines (WCAG) are explained below in table 1.

The WCAG guidelines are divided into four main elements, which enable accessibility to be fulfilled. The website must be perceivable, functional, understandable, and robust. The activities which perceptibility is achieved are, for example, text options for non-text content, captions or other options for multimedia, the content can be presented using assistive technologies without the content losing its meaning, and the content is easy for the user to see and hear. Operable pages are achieved when the site also works with keyboard commands, the user has enough time to use with the page's content and actions, the site does not cause physical reactions or seizures, when the user can easily find the site's content and the site is easy to navigate and the site is also usable with control methods other than keyboard commands. Understandable pages are obtained when the text is readable and understandable, the site is built to look and function predictably and helps the user avoid making and, if necessary, correct mistakes. Robust pages are when the site is compatible with the tools used by current and future users. (Henry & Dick, 2023)

Table 1. WCAG guidelines (Henry & Dick, 2023)



Technically, the pages are accessible when the page has a language attribute, an alternative description defined for the images with the alt attribute, the page has a title, and the text stands out from the background with sufficient contrast. In terms of technical aspects, accessibility is measurable. Ease of use and comprehensibility as well as visibility are subjective, i.e. experiencing them is individual and may vary depending on the situation. (Selovuo, 2020)

2.3 Search Engine Optimization

Nowadays most of the website visitors come from a search engine. The world's largest and most used search engine is Google, with a 91.47% market share (Bianchi, 2024). In this thesis, we focus on researching search engine optimization specifically through Google.

2.3.1 The purpose of search engine optimization

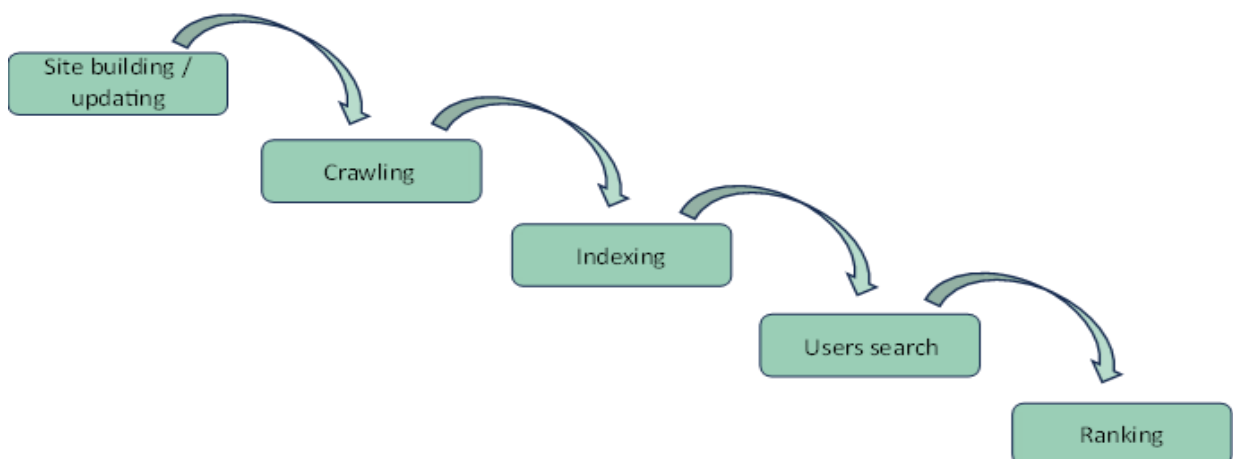
Search engine optimization is a series of actions that aim to raise a website as high as possible on the search engine results page in organic results. The search engine defines the algorithms based on which the results are displayed on the results page. Optimization efforts aim to tell search engines what kind of content is on the page, so that the search engine can display the site on the results page when it matches the user's search query and leads the user to the web page. (*SEO Starter Guide*, 2024)

Search engine optimization aims to increase the amount of traffic and improve the quality of the site. Organic search results in a search engine are free visibility for page. The competition for placement in organic results is fierce. At the best, successful Search Engine Optimization is cost-effective, far-reaching, and affordable. Search engine optimization is important in increasing the website's awareness and brand. If the page is not found in the search engine, it is considerably more difficult to get traffic to the page. (Lahtinen et al., 2022, pp. 189–190)

2.3.2 How search engine works

To be found in a search engine after building or updating the site must be crawler friendly. Search engine operation process is described below in figure 1. (*SEO Starter Guide, 2024*)

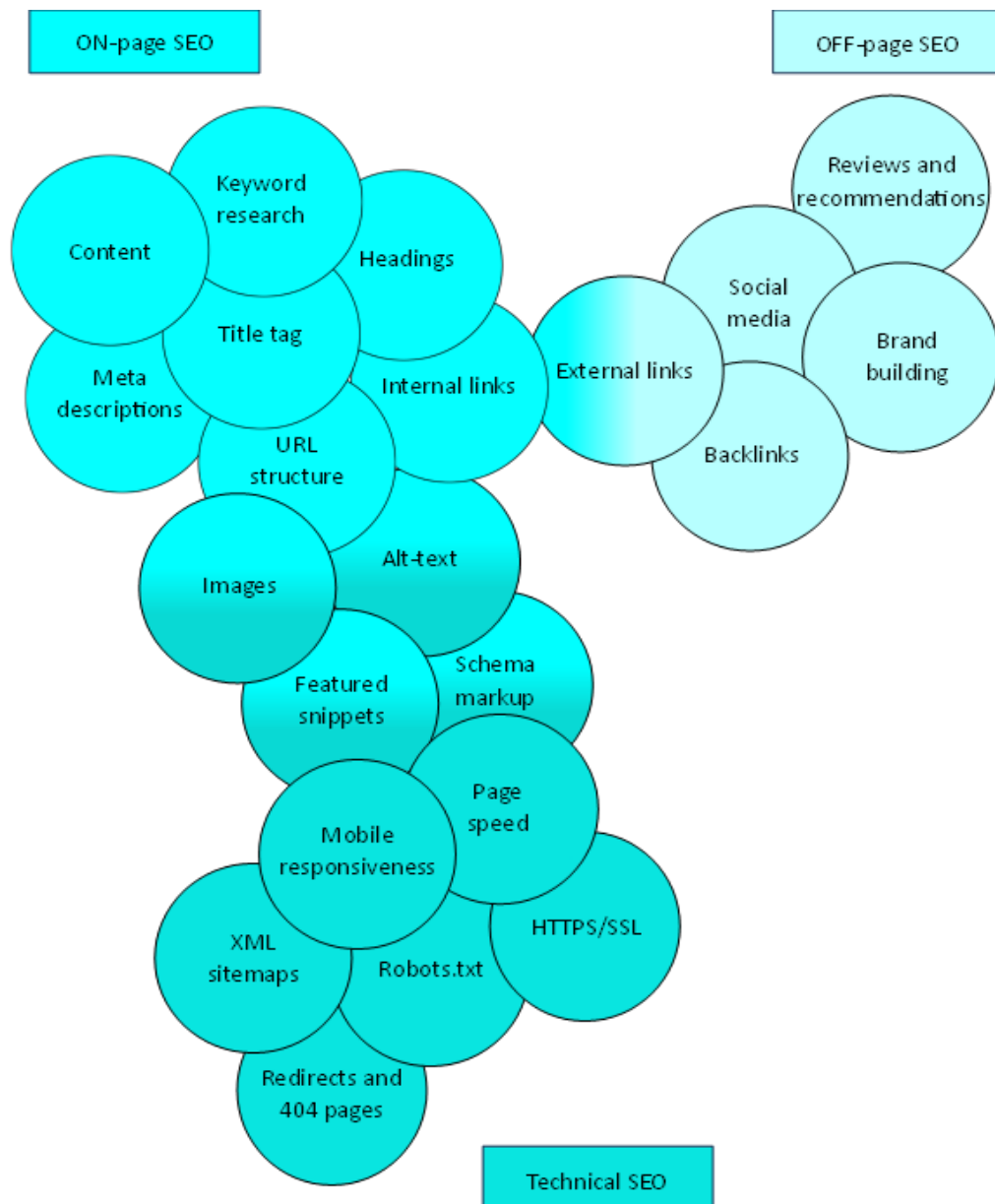
Figure 1. Operation of the search engine (*SEO Starter Guide, 2024*)



2.3.3 Elements of SEO

As the figure 2 shows, search engine optimization consists of three areas: ON-page optimization, OFF-page optimization and technical optimization. All three areas are intertwined. Between ON-page optimization and technical optimization, there are factors that affect both ON-page and technical SEO. There are also factors in ON-page SEO and OFF-page SEO that affect both areas.

Figure 2. Elements of SEO



2.3.4 Technical SEO

Technical Search Engine Optimization concerns the technical features of the site, which help the search engine understand and find the site better and faster, offering more relevant results to the user. Technical optimization has an impact on the user experience, thereby increasing the user's comfortability on the site. For a page to be found in a search engine, the page must be readable and indexable by the search engine's crawler. The website's architecture must be SEO-friendly. Search engines prefer that the front page has internal links to category pages, from which there are links to the next levels. Pages with no internal

links are called orphan pages. Due to the lack of links, Crawlers cannot get to the page to index the page. (Pol, 2024)

Google highly recommends submitting an XML sitemap to support more efficient indexing (*Learn about Sitemaps*, 2024).

Building URLs to be consistent makes it easier for the site to be found in a search engine and helps the user to understand his/her location on the site. Specifying the primary URL is important if several URLs produce the same or nearly the same result for the search engine. In this way, confusing duplications are avoided for people and the search engine. A URL defined as a primary URL is also called a canonical URL. (*Canonical Url*, 2024)

The HTTPS protocol and SSL certificates are search engine ranking factors. The HTTPS protocol and SSL certificate increase the user's trust in the site and thus can have a positive effect on the ranking in the search engine compared to a site that does not use the protocol and certificate. (*Canonical Url*, 2024)

The speed of the site is important for the ranking of the page in the search engine, the longer it takes to load the site, the further the site falls in the search results. Site speed can be improved by compressing the size of images and files to a smaller size, cleaning unused parts of the code, optimizing the size of the web page. (Edgar, 2023, Chapter 6)

The mobile usability of a website is nowadays a very critical part of search engine optimization. Google strongly recommends making responsive pages. Crawlers of the Google search engine use mobile-first indexing for indexing. This means that if there is a page on the site that is responsive to a mobile device, the page is more likely to be ranked better in the search results than a page that is not mobile-responsive. (*Mobile Site and Mobile-First Indexing Best Practicies*, 2023)

Robots.txt files are text files that can be used to direct crawlers to skip some pages or parts of a site so that they are not indexed by the search engine. However, this does not prevent the page from appearing in search results or that another page cannot link to that page. If the page or part of the page is to be completely hidden from crawlers, the noindex directive is used. (*Introduction to Robots.Txt*, 2024)

Sometimes URLs change, for example with a site change, but search engines still find the old site. For the old page, it is recommended to set a redirection to the new site, so that the visitor to the site does not end up in a dead end. (Edgar, 2023, Chapter 2)

If the site has content in several languages, it is good to add the hreflang tag to the site. The Hreflang tag recognizes the user's language and location and offers the correct language version to the user based on that. (*Localized Versions*, 2024)

Google's crawler may encounter unexpected errors that are signaled by http status codes. Usually, the errors are due to incomplete redirects when the site has been removed, moved, or due to a server error. (*HTTP network errors*, 2024)

2.3.5 ON-page SEO

ON-page optimization includes actions that are carried out inside the site (Komulainen, 2023, p. 239). Content is the most important factor in search engine optimization. Without high-quality content, a site cannot stay at the top of the search engine for long. High-quality content aligns with keywords, affects the user experience, increases the impression of expertise, and enables backlinks, which in turn are ranking factors in google. The quality of the content is classified according to Google's search quality rater guidelines. Quality content is content that is experience, expertise, authoritativeness, and trustworthiness. Google calls it E-E-A-T. E-E-A-T itself is not a ranking factor. Because Google wants to offer quality and expert content, a site that follows the guidelines has a better chance of ranking higher in the search results than a site that does not follow the guidelines. (*Creating Helpful Content*, 2024)

Keyword research and keyword generation play an important role in search engine optimization. Keywords are search words or phrases that the user uses to search for answers in the search engine. Keywords should be placed in critical places on the site, such as the title, the beginning of the text and subheadings. In this way, the search engine understands the content of the site better, and the user can quickly see if the content of the page matches the search. (Lyons, 2023)

Title tags show the site's title on the search engine's result page, which is a short description of the page's content. Title tags also appear as the name of the browser tab when the site is open. (*Title Link*, 2024)

Meta Descriptions is a short text about the content of the page visible in the search engine. Meta description does not directly affect search engine visibility but gives the user a description of whether the content of the page corresponds to the user's search. (*Control Your Snippets, 2024*)

Headings and Subheadings help the search engine to structure and understand the content. Heading breaks up the text appropriately, making it easier for the user to read and understand the text. It is recommendable to use keywords and variations in titles. (Lyons, 2023)

Editing the URL address to be clearer and shorter helps the search engine and the user understand the content of the page better (*Google URL Structure Guidelines, 2024*)

Internal links are pages linked to each other within the site. Adding links to the page helps the search engine understand the structure of the site and makes it easier to navigate on the site. Using external links on the site offers the user a better experience and increases the reliability of the site in the eyes of the user. The links should be merged into a descriptive anchor text so that users know where the link leads. (*Links, 2024*)

Adding pictures to the site brings liveliness and improves the possibility of ranking in search engine image searches. The images must also to optimize, because too large an image size slows down the entire page. Descriptive alt text added to images improves the search engine's chances of finding a match in the image that matches the user's query. It is important to optimize the speed of the website because speed is a factor affecting search engine ranking. (*Image SEO, 2024*)

Featured Snippets are small snippets from the website displayed by the search engine, which correspond to the search submitted by the user of the search engine. Featured snippets are not a ranking factor itself but it could increase visibility in the SERP if the snippet is optimized well and it hits to users queries (*Featured Snippets, 2024*)

Schema markup increases the search engine's understanding of the site's context and increases the user's trust in the site. Schema markup can be a star rating, tell the recipe's cooking time or even the ingredients or the number of reviews. Schema markups either are not a ranking factor, but it could increase visibility in the SERP if the markups are optimized well and hits to users queries. (*Introduction to Structured Data Markup, 2024*)

2.3.6 OFF-page SEO

Off-Page SEO is optimization that takes place outside the website. In this case, we are talking about increasing reputation, link building, social media marketing. The search engine's algorithm sees recommendations, links, and mentions from outside the site as a factor that increases the site's reliability and reputation. Credibility can be increased by following the E-E-A-T concept, i.e. experience, expertise, authority, and trustworthy. In terms of search engine optimization, it is important to get links from external pages to your own website. These links are backlinks. Backlinks are a signal to the search engine that the website is a reliable, authentic, important page. Especially if the link comes from another page that already has a good reputation in the search engine. Content marketing is off-site optimization and an excellent way to increase awareness of your website. Content marketing can be done on your own social media channels by sharing texts and topics from websites. Content marketing can be influencer marketing, where a social media entrepreneur tells and advertises a website/product and thus increases visibility and reaches a new audience. At the website can publish guest articles, in which case another expert in the field publishes his own article on the website and increases visibility and audience. Backlinks are also built with influencer marketing and guest writing. Podcasts are pre-recorded audio recordings that are shared on various podcast platforms. A mention or link in a podcast can bring more visibility and audience. Republishing content on different publishing platforms and forums helps to reach new audiences and increase visibility. (Silva, 2024)

2.4 Theoretical approaches to usability and user experience

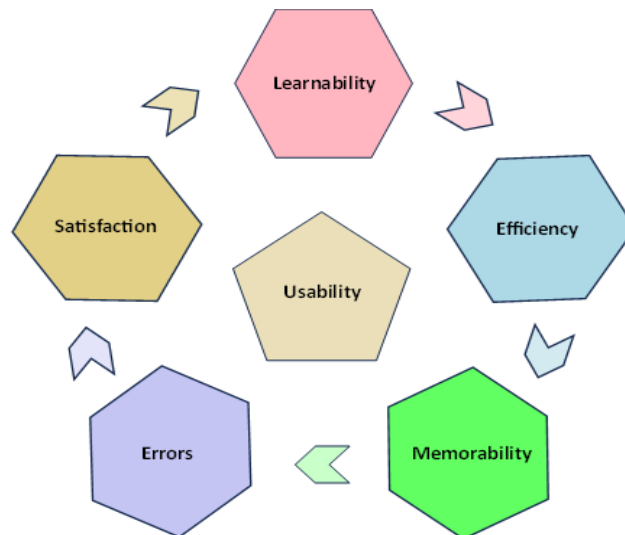
The definition of the usability is based on the ISO 9241-11:2018 standard, which defines the usability result, terms, concepts, and principles (ISO 9241-11, 2023). The user experience itself is thought of as feelings and emotional states that the user experiences when using a product or service. During a pleasant user experience, the user's satisfaction with the product increases, while negative experiences decrease satisfaction. Feelings and user experience are very individual and can vary depending on the user and the situation. (Kraft, 2012, Chapter 1, User Experience Curve)

The definition of usability is the fulfillment of certain quality criteria. According to Nielsen, usability is defined by the fulfillment of five criteria, shown below at the figure 3.

Learnability tells how easily a new user learns to navigate and use the site when using the site for the first time. Efficiency means how quickly users complete their tasks on the site.

Memorability answers does return users after a long period of time remember how the site works. Errors describe does the users make a lot of errors, how serious are the errors and can the user correct the error themselves. Satisfaction answers are the users satisfied with the site's operation. (Nielsen, 2012).

Figure 3. Nielsen usability theory (Nielsen, 2012)



Nielsen's theory focuses more on the definition of usability and how to concretely build a usable user interface by following the mentioned criteria. Nielsen's criteria can be implemented with technical measures.

Peter Morville has created a honeycomb model that can be used to explain the most relevant areas for a successful user experience. Peter Morville's Honeycomb theory expands usability criteria by considering the aspects of accessibility and usefulness. The Honeycomb theory is largely a subjective theory, i.e. the goal is for the user to experience emotional states in addition to usability to achieve the user experience.

Figure 4 below shows the user experience honeycomb created by Morville. Each part of the honeycomb describes one component from which the user experience is built. Usable means that the product, service, or website is easy to use for the user. Website is findable when the user finds the information the user needs without much effort. Accessible is when the site is accessible to persons with disabilities. Useful when the user experience is useful to the user according to the user's purpose. Credible means that the information on the site is credible and users can trust it. Desirable is when websites user experience meets the users' emotional needs. Valuable is when the site offers its users valuable content. (Morville, 2004).

Figure 4. User Experience Honeycomb (Morville, 2004)

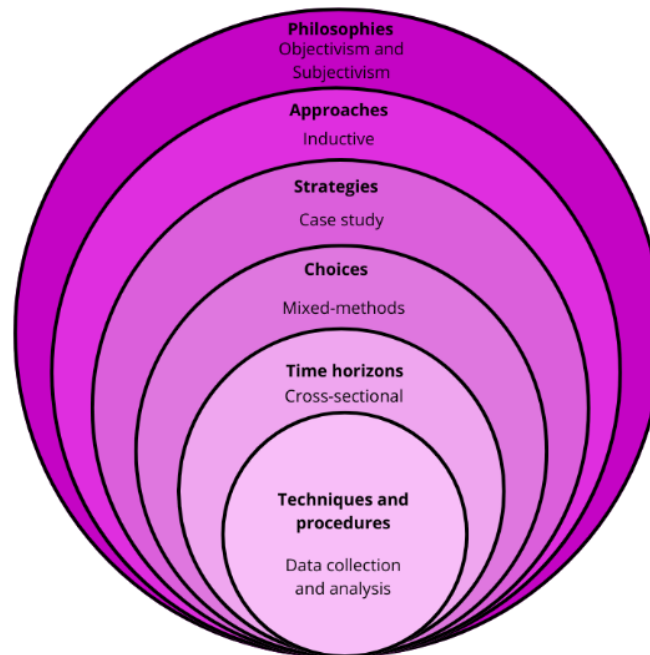


User experience has an impact on the success of a website. A positive user experience makes the user return to the page again, a bad user experience makes users leave the page quickly and they don't come back (Chaffey & Ellis-Chadwick, 2015, p. 388). A well-made, easy, and functional website inspires confidence from the user's point of view and increases user satisfaction on the site. User satisfaction with the page increases the time the user spends on the page, reduces the bounce rate and increases engagement (Lahtinen et al., 2022, p. 164). The user's experience on the page is one of Google's algorithms that affect the page's visibility in search results (*Page Experience*, 2024).

3 Methodology

This chapter presents the research methodology used in the thesis. The research is guided by the work model developed and presented by Saunders, Lewis and Thornhill in their book *Research Methods for Business Students*, the research onion, which helps the researcher to understand, plan and implement the research process. (Saunders et al., 2007, p. 101). The research onion in Figure 5 will be explained in the following paragraphs.

Figure 5. The Research Onion (Saunders et al., 2007)



In their book, Saunders et al. (2007, p.101) say that a person's existing basic beliefs and assumptions about the world view largely define the research philosophy used by the researcher. This ultimately determines the direction of the research and the methods used in the research. Research philosophy affects the researcher's perception of knowledge and the processes of its development (Saunders et al., 2007, p. 101).

3.1 Research philosophy

In this thesis, research philosophies represent both a subjective and an objective angle. Both subjective and objective research philosophy belong to the branch of the philosophy of ontology. In the ontological branch of philosophy, the nature of reality is considered. (Saunders et al., 2007, p. 108)

In subjectivism, the world is looked at from the angle of how people experience it and what their opinion is about the surrounding things and phenomena. These experiences and opinions are subject to change. The qualitative research carried out in the thesis, an interview, opens up to the author a deep understanding of the experiences and perspectives of individuals, how the investigated website works. (Saunders et al., 2007, p. 108)

In objectivism, the world is viewed from the angle of quantitative facts. In objective research philosophy, the world is explained with numerically measurable metrics, such as the Google Lighthouse analysis implemented in this thesis. In quantitative research, the facts are and remain as the same independent actors. For example, regardless of how the interviewees in this thesis consider the investigated website, the Google Lighthouse report shows the same numbers. (Saunders et al., 2007, p. 108)

By using these two perspectives together in this research, a broad understanding of the website's situation and answers to the research questions is obtained. The research questions are best answered by dividing the research into qualitative research and quantitative research.

3.2 Approaching to research

Next layer of the research onion is the logic of reasoning. The analysis approach used defines the logic of the analysis. The approach can be inductive reasoning or deductive reasoning. Inductive reasoning starts from the data, where the aim is to create a general understanding and theory on the subject based on the research data. Deductive reasoning, on the other hand, is theory-oriented and aims to verify it as true. There is a third form of reasoning, which starts from the fact that a theory or conclusion can be formed based on the most likely course of events, this is called abductive reasoning. (Tuomi & Sarajärvi, 2018)

In this thesis, the approach is inductive, because the logic of the research's reasoning starts from the observations and based on the material, with the aim of forming a generalizable theory or conclusion. Inductive approach is used in both research, qualitative and quantitative research.

3.3 Research strategy

A case study is a suitable research strategy when is wanted to gain a deep understanding of the contexts and processes of the researched object. A case study can be considered a research strategy that focuses more deeply on one or more smaller details, "cases". In a case study, the research material consists of several different sources and sources collected in different ways. The material of the case study consists of qualitative data, but in addition to qualitative data, quantitative data can also be used. A case study is suitable as a research

strategy when the research question asks "what", "how" and "why". (Saunders et al., 2007, p. 139)

In this research, the case study answers the research questions "How does website user interface design affect SEO?", "How do user experience and SEO relate to website user interface design?" and "How does the design of the user interface of the site affect the user experience?".

3.4 Research method

Mixed method research is the name for a research method that uses both qualitative and quantitative research data. The methods can be used either simultaneously or one after the other. In mixed technique research, research methods should not be mixed with each other. In mixed technique research, the material is analyzed in the same form as it was collected. (Saunders et al., 2007, p. 145)

In mixed sample research, the data can be analyzed in a different form than where it was collected. Qualitative data can be made quantitative and analyzed numerically. The opposite can be done for quantitative data. (Saunders et al., 2007, p. 146)

In qualitative research, the approach is empirical research, where the material is obtained from interviews, by observing the environment, experiences, and behavior. Qualitative research aims to understand and interpret things and phenomena happening around us. (Adams et al., 2014, p. 6). Qualitative research data does not contain mathematical or numerical data or statistics (Basias & Pollalis, 2018, p. 94).

Quantitative research is a numerical and statistical approach to research, where data is analyzed with a program suitable for the situation. It is formal and has a rigorous and systematic strategy for generating knowledge. Quantitative research investigates and explains issues and phenomena with the help of numerical and detailed data. (Mohajan, 2020, pp. 50–51)

This research uses a mixed technique research method, because by using both qualitative and quantitative research, we gain a broader understanding of the website's user experience and the state of search engine optimization. Together, the research methods complement each other and enable more thorough research, including subjective experiences and objective performance measurements.

3.5 Time frame of the research

The time spent collecting research data can be expressed in two ways. When the research material is collected in a short period of time, is spoken of cross-sectional research. In cross-sectional research, the material has been collected in a certain rather small-time frame, which means that the research cannot find out, for example, the effects of extensive changes and analyze them. Cross-sectional research is a snapshot of a study that takes place over a certain period of time. (Saunders et al., 2007, p. 148)

In longitudinal research, the time spent on the study is longer than in cross-sectional research. Longitudinal research should be used when the research examines change or development. The answer to the question can be found in longitudinal research "Has there been any change over a period of time?". (Saunders et al., 2007, p. 148)

The time frame used in this thesis was cross-sectional research. The data collection of the research took place in a short period of time and the purpose of the research was not to make a long follow-up of the website.

3.6 The techniques and procedures used in the research

In this research, both qualitative and quantitative research has been used to get the broadest possible understanding of the website's situation and based on them, development proposals. Qualitative research collects material that helps in a deeper and more detailed understanding of people's behavior and customs around the object under study. Quantitative research, on the other hand, can analyze large amounts of material and make generalizations about the situation of the object under study based on it. (Adams et al., 2014, p. 6)

In this research, qualitative data was produced by conducting an interview and aims to find out the answers to the questions "How do user experience and Search Engine Optimization relate to each other in the design of a website's user interface?" and "How does the design of the user interface of the website affect the user experience?"

Quantitative research in this thesis has been done using search engine optimization tool and analyzing its answers. Quantitative data were gathered by running a Google Lighthouse

report. Quantitative research aims to find out the answer to the question "How does the design of the website's user interface affect search engine optimization?".

3.6.1 Qualitative research

This section describes how the author handled and analyzed the data from qualitative research. Content analysis is an analysis method of qualitative research. Content analysis is a versatile analysis method used to analyze qualitative research. Content analysis helps to get a clear overview of the research topic. Content analysis is flexible as an analysis method and is suitable for many types of research. (Tuomi & Sarajärvi, 2018, loc. 119)

In this thesis, qualitative research has been conducted as an interview. The interview explores the answer to the questions "How does the design of the user interface of the website affect the user experience?" and "How do user experience and Search Engine Optimization relate to each other in the design of a website's user interface?". The interview was conducted semi-structured, which means the questions of the interview were defined in advance and presented in a certain order. The interviewee can answer the questions freely, but the answer options are not given in advance. (Eskola & Suoranta, 1998). The semi-structured interview format is suitable for this thesis because the goal is to evaluate the impact of the user interface on the user experience, which should not be pre-introduced.

In their book qualitative research and content analysis, Tuomi and Sarajärvi (Tuomi & Sarajärvi, 2018) say that in their book, Miles and Huberman divide material-oriented qualitative research, i.e. inductive material analysis, into three parts: Material reduction, material clustering, and abstraction, i.e. creation of theoretical concepts. (Tuomi & Sarajärvi, 2018, loc. 142)

In reduction, qualitative data is reduced. In data reduction, the transcripts of the interviews are carefully read through, and notations are made in the text where there are issues relevant to the research. Next, a new file was created from the interview questions, into which each interviewee's answer, separated by their own color codes, related to the question was moved under each interview question. (Tuomi & Sarajärvi, 2018, loc. 143)

In clustering, individual words, sentences and expressions are searched for from the answers of the interviewees, in which there are issues that are significant from the point of view of the research, for example issues that concerned the appearance and style of the website as shown below at the table 1. In this step, marked and coded things are separated

to identify themes that stand out from them. Themes are factors that emerge as central points from the data. The themes are grouped under higher headings so that they can be understood in a wider context and summaries of the themes can create based on the interviews. (Tuomi & Sarajärvi, 2018, loc. 143)

Table 2. Clustering table

Lower category	Upper category
Clarity User friendliness Understandable	Usability
Colors and appearance Credible	The effect of appearance on the user experience
Producing value The quality of the content	Content quality
Performance good Mobile usability good Tablet view bad	Performance
Reachable	Accessibility

Left sidebar	
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In the abstraction phase, theories and concepts are created based on the research material about the topics that emerged in the clustering phase (Tuomi & Sarajärvi, 2018, loc. 146).

At the end, based on the issues raised in the interview, suggestions for correction and improvement are made for the user-friendliness of the website.

3.6.2 Quantitative research

In the quantitative research, the material has been collected with an open-source tool that works in the Chrome browser, which helps understand and improve the quality of web pages. Google Lighthouse can be used to perform performance, accessibility, SEO, and web application checks. Google Lighthouse is given the URL of the desired web page to be checked, and Google Lighthouse runs checks on the page and based on the check creates a report from which failed tests can be extracted to improve the page. Google Lighthouse is also used to test the mobile friendliness of the website. (*Lighthouse*, 2016)

The Google Lighthouse audit was started by opening the web page to be analyzed in the Chrome browser. Pressing the right mouse button and selecting "Tarkista" or "Inspect" opened Chrome's developer tools. In the Developer Tool window, the "Lighthouse" tab was selected. On the tab, you could select the things you wanted Lighthouse to make a report on. Here you could also select the device whose view was analyzed. In this analysis, first the computer view of the website was analyzed, and then the mobile device view. After that, by clicking "Analyze page load" Lighthouse performed the analysis and printed the report.

The Google Lighthouse report has only been run once, and based on it, it has been decided to conduct research of quantitative data, which evaluates the website's performance and the state of search engine optimization. At the end, based on the results of the report, recommendations are made to improve the website's performance.

4 Results

In this section, the results of the study are presented and examined in a comprehensive manner. First, we examine the interview conducted to obtain qualitative research material and the data collected from it. After this, the results of the quantitative study will be examined in more detail.

4.1 Qualitative research

The interviewees selected for the research were chosen from among the author's circle of acquaintances with a wide variation, according to the fact that the interviewees would reflect the average user of search engines and websites and that the author believed had insight and experience in evaluating the user experience. The age, gender, education, and professional background of the interviewees selected for the interview varied widely, from a full-time student to a software engineer to a person working in a superior position. The age range was 22–50 years. The educational background varied from a professional degree and matriculation examination to a master's degree. The interview questions were created based on Morville's honeycomb theory and aim to provide a versatile answer to how the interviewees perceive the user experience of the presented website and the operation of the user interface.

4.1.1 Usability

The answers of all the interviewees showed that the website is easy to read, and the structure of the page is good and clear. The interviewees liked that important and relevant information was easily displayed. Such information includes, for example, the contents of studies and information related to applying. The interviewees liked the colors and visual elements. The colors and contrasting boxes clearly increased the interviewees' interest in the page and made it easier to find the necessary things on the page.

“I like the fact that there is used different colors and used visuals, that there is not only black text on a white background. This starts out pretty basic, i.e. black text on a white background, but when we go further here, then there is this color here and there will be changes to it.”
(Interviewee 2)

The top bar of the page received praise for its comprehensive list of links. However, the responses of the interviewees emphasized individual and varying needs, for example the possible need to later search for different information, contact information or social media links.

The design of the website divided opinion. Some of the interviewees presented development ideas for improving the page's usability. For example, interviewees 3 and 5 thought the page was really long. Interviewee 3 say:

“If there is something interesting here, which might not be here until the end of the page, then you would have to scroll quite a lot here, and if you have a slightly smaller screen, that might be a problem.” (Interviewee 3)

Interviewees 2 and 5 wished that there had been clickable titles at the top of the page, which by clicking would take you to the desired section, because they thought the black and white text section at the top of the page was long and a bit boring. Interviewees 3 and 5 wanted the list of study content at the top left of the page as links to a deeper page.

Three out of five interviewees found the page understandable. Two found the site mostly comprehensible but felt that the accessibility challenges and the long page made the page more challenging to understand.

4.1.2 Desirability

All the interviewees praised, for several questions, the colors and boxes used on the page and how they make it easier to visualize and make the structure of the page easier to manage and understand. The interviewees thought the fonts used on the page were good and legible. Pictures and videos were also mentioned as good things on the page, for example, interviewee 5 said:

“The smiling student in that picture brings a warm and comfortable feeling. Smiling person there. However, convincing, but approachable. I like it.” (Interviewee 5)

Most of the interviewees also missed color at the top of the page and contents and links embedded in boxes that could be opened, which would lighten the structure of the page. Interviewees 1 and 4 say:

“These colours and boxes make this so interesting that it is not the same black text on a white background all the time. I like it. Could there be more of colours and boxes at the beginning as well, to clear structure.” (Interviewee 1)

“Well, the first thing that caught my eye is that different colors have been used in this text. I think it's really nice, because it would not be nice to read just plain text like beginning of the page. So, it's good that these colored boxes have been put here. It immediately draws attention.” (Interviewee 4)

The site was basically considered reliable and believable. According to the interviewees, this impression was influenced by the fact that HAMK is a well-known higher education institution, a public organization, the school's website, and the interviewees perceived the page as reliable.

4.1.3 Quality and value of the content

In their own current situation, the interviewees did not find the content of the page to be topical, but they believed a person for whom applying for education is topical will benefit from the content and information on the page. For such a person the page is a valuable source of information. Interviewee 1 also brought the point of view that the page can also be valuable for the educational organization, as the page is an excellent information bank for those interested in education. A large amount of information reduces the need for contact in cases that can be prevented with good communication and information.

All the interviewees believed the content of the website is high-quality and comprehensive. The interviewees felt that all essential issues have been brought to the page. Interviewee 1 highlighted the fluency of the text as a sign of quality, as he put it "there is no clumsy English". In addition, he appreciated as a sign of quality that at the end of the page there are links to cookie information, data protection practices, a description of transparency, contact information, social media links and a contact form and feedback form.

4.1.4 Performance

The website's performance was considered good by all interviewees. The interviewees got the page working and the links opened quickly and flawlessly. The videos also opened and worked exactly as they should.

All interviewees evaluated the page's mobile usability with a mobile phone. One interviewee also used Mobile View on a tablet. In the opinion of all interviewees, the Mobile view on a mobile phone was perceived to be even slightly better than the wider view on a computer screen. In the narrower mobile view of the mobile phone, the page became really long.

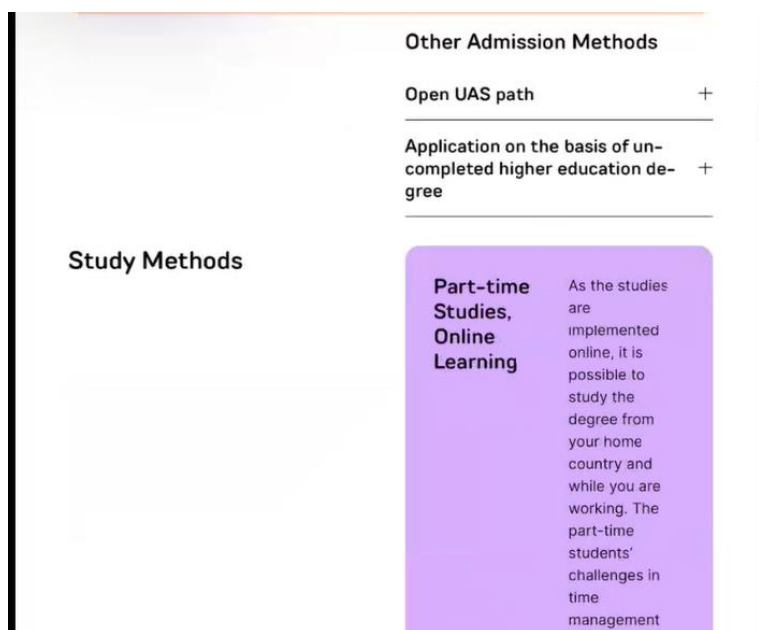
“When you have a mobile screen, you notice everything, when maybe there were things on the edge of the page on the computer screen that you didn't notice. I see that this Mobile page is even clearer than the website on the computer screen.” (Interviewee 3)

“It's probably easier to read on a cell phone because the eyes fall on a certain area when reading this on cell phone, it's easier to concentrate. Although this is such a long.” (Interviewee 5)

The interviewees felt that in this mobile view, the need for links at the top of the page was emphasized, which could be clicked to go deeper into the content of the page. The black and white text section at the top of the page was perceived to be longer on the mobile phone screen than computer screen, so the interviewees hoped for links, color, and drop-down boxes to condense the content.

The tablet's view was similar in structure to the view on the computer's wider screen, but in a narrower screen. The length of the text section at the top of the page was also highlighted on the tablet screen, but there was still some text to read. On the tablet screen, the text was placed on the right side of the screen. In the tablet view, the interviewee would have liked to have links on the left side that would take the page to the content. The Study Methods section on the longer side was placed on the right side of the screen as a very narrow strip. As shown at figure 6, text went really narrow and made reading very difficult.

Figure 6. Screenshot from interview 5, tablet screen



4.1.5 Accessibility of the page

Almost all interviewees found the website to be accessible. The interviewees evaluated accessibility in many ways. Interviewee 1 briefly stated that the page must be accessed in the ways made possible by current technology. Interviewee 2 liked that the page can also be accessed by listening. He also liked the fact that translations were available on the page with the help of a dictionary. Interviewee 2 also thought about the font size and visibility for people with low vision and on a small screen. Interviewee 3 tested the functionality of the page with a mouse and keyboard. Interviewee 3 was a little confused by the "Kuuntele" bar on the page. Interviewee 4 wished that the "Kuuntele" bar was higher on the page and more visible so that it could be found immediately. Interviewee 5 wanted the page to be accessible in Finnish as well. And not just through a translator or a dictionary translation. The language change to Finnish at the top of the page did not work.

When evaluating the usefulness of the page, several interviewees pointed out that they wished for the summary of degrees and studies on the left side of the top of the page as links. The text section at the top of the page, which tells more about the studies, was hoped to be linked titles or content boxes in the same way as it is later the page, in which case the interest in the content would remain and one could choose the section that one wants to study in more detail.

4.2 Quantitative research

In this thesis research, the search engine optimization tool Google Lighthouse were used to collect quantitative data. Google Lighthouse were used to investigate the performance, usability, and impact of the website's user interface on search engine optimization. First, the reports are viewed from the computer view and then from the mobile view.

4.2.1 Google Lighthouse audit desktop view

With the help of the report produced by Google Lighthouse, the website's performance, accessibility, and search engine optimization were investigated. In its report, Google Lighthouse scores each area on a scale of 0-100. 0 is the worst score and 100 is the best you can get.

From figure 7, we can see that the website's performance scores 96/100. This means that the performance of the web page is quite good. For accessibility, the website gets 98/100 points, which is also a good result. For practices, the website gets a full 100 points, which is an excellent result. And 92/100 points for search engine optimization. Since the Progressive Web App's requirements are not met, the report does not give the metric a score.

Figure 7. Google Lighthouse report (Google Lighthouse, 2024)

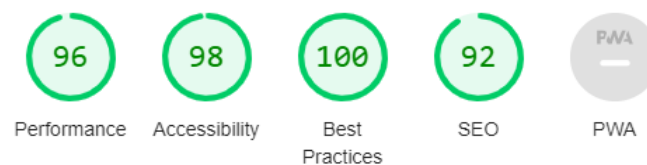
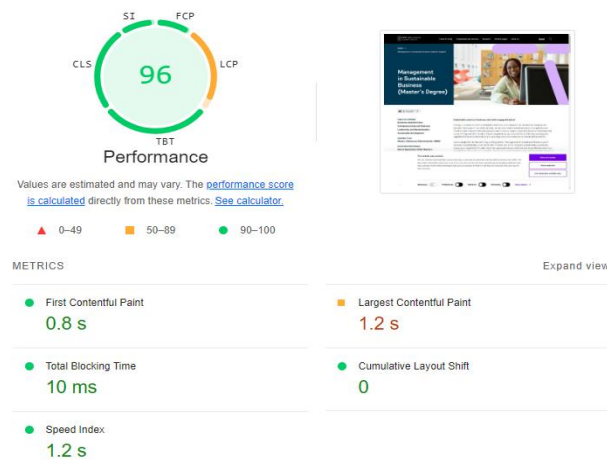


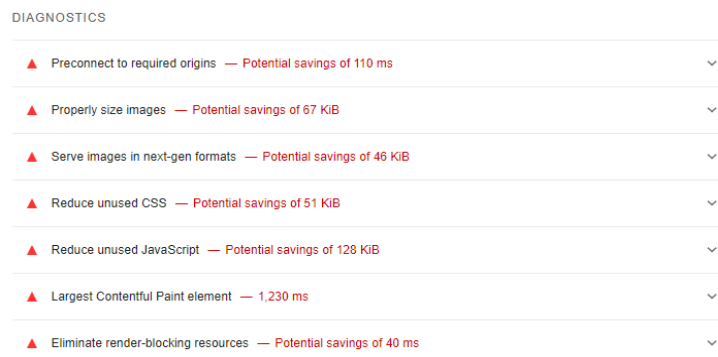
Figure 8 explains in more detail what the performance report contains. The total performance score is determined by the times and values of the factors affecting the performance. These metrics are converted into points, from which a value is determined for each factor. The picture shows that these indicators affecting performance are mainly at a good level. Also, the Largest Contentful Paint time, i.e. the time each page takes to fully load on the user's screen, is still in the green area according to the reference values defined by Google. (Walton & Pollard, 2024)

Figure 8. Google Lighthouse report performance (Google Lighthouse, 2024)



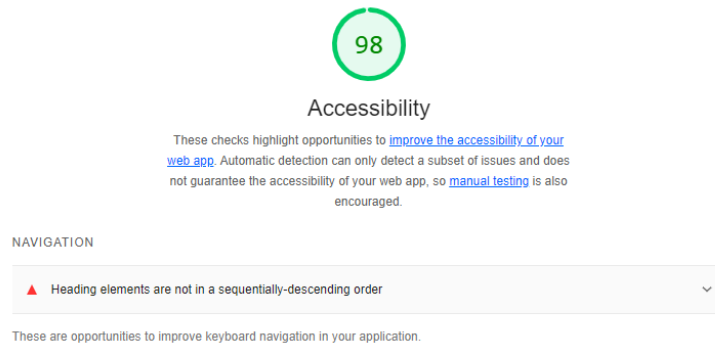
In figure 9, the Google Lighthouse report suggests the following steps to be taken to improve the website's performance. Preconnect to required origins is a function where a web page tries to establish a connection with third-party servers even before the page needs a resource. Properly size images means that the images should be scaled before they are uploaded to the web page. An image that is too large slows down the page's loading time. Serve images in next-gen formats asks to change the format of the images on the page to the new generation formats WebP and AVIF. Reduce unused CSS and JavaScript tells you to remove unused CSS styles and JavaScript codes. The Largest Contentful Paint performance meter suggests improving the image's Time To First Byte time and Eliminate render-blocking resources rendering delay, as well as removing rendering-blocking resources from the page. (Lighthouse, 2016)

Figure 9. Google Lighthouse report diagnostics (Google Lighthouse, 2024)



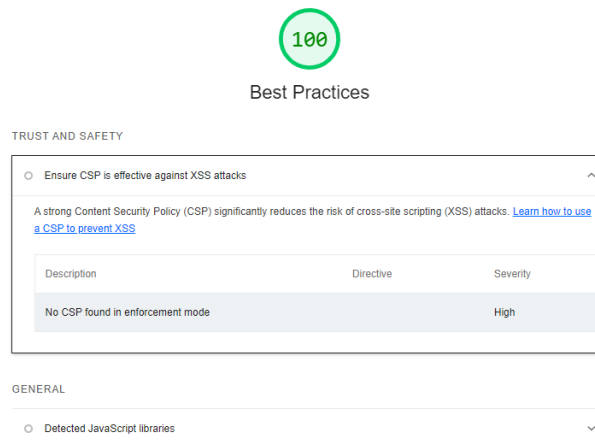
In figure 10, the Google Lighthouse report gives the accessibility of the website 98/100 points. Which is an excellent score. The only correction suggestion report gives is for titles that are not consecutive in descending order. (*Lighthouse, 2016*)

Figure 10. Google Lighthouse report accessibility (Google Lighthouse, 2024)



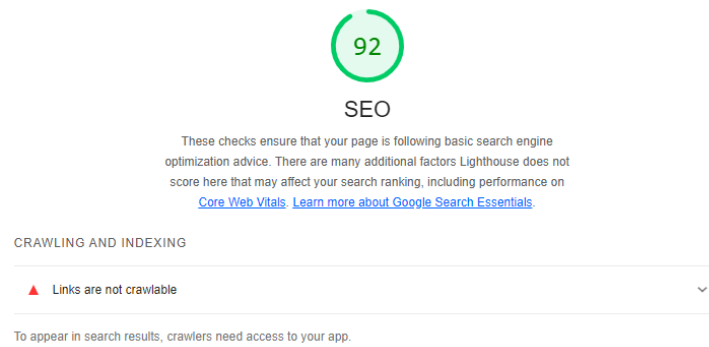
Although in figure 11, according to Lighthouse, the practices of the website are at a good level, Lighthouse suggests as an improvement to ensure that the content protection policy (CPS) is active and thus prevent script attacks. (*Lighthouse, 2016*)

Figure 11. Google Lighthouse report best practices (Google Lighthouse, 2024)



The SEO check performed by Google Lighthouse gives an indicative idea of how well the website is optimized for search engines. Lighthouse checks the website for some factors affecting technical search engine optimization. On the website being checked, Lighthouse suggests links that cannot be crawled by the search engine bot. Figure 12 shows the error message given by Google Lighthouse. (*Lighthouse, 2016*)

Figure 12. Google Lighthouse report SEO (Google Lighthouse, 2024)



4.2.2 Google Lighthouse audit mobile view

This section looks at the Google Lighthouse report from a mobile perspective.

From figure 13, we can see that the website's performance scores are 70/100. That is an average result of the performance of the web page. There is some improvement to do in the performance of the website. For accessibility, the website gets 98/100 points, which is a good result. For best practices, the website gets a full 100 points, which is an excellent result. And 91/100 points for search engine optimization. Since the Progressive Web App's requirements are not met, the report does not give the metric a score. (*Lighthouse*, 2016)

Figure 13. Google Lighthouse report mobile view (Google Lighthouse, 2024)

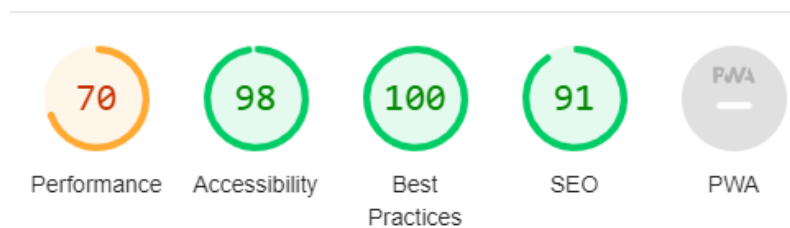


Figure 14 explains in more detail what the performance report contains. In the performance metrics, two metrics are in the green area, i.e. scored 90–100 points. One metric received average scores between 50 and 89 points, and two metrics had a poor result with 0 to 49 points. The best scoring metrics are Total Blocking time and Cumulative Layout Shift. The Speed Index has received a moderate result. First Contentful paint and Largest Contentful Paint have received poor scores. The bad scores are because the first element of content and the entire content takes too long to load. The Largest Contentful Paint time is still

in the average range according to Google's reference values but requires improvements to improve the performance of the page. (*Lighthouse, 2016*)

Figure 14. Google Lighthouse report mobile performance (Google Lighthouse, 2024)

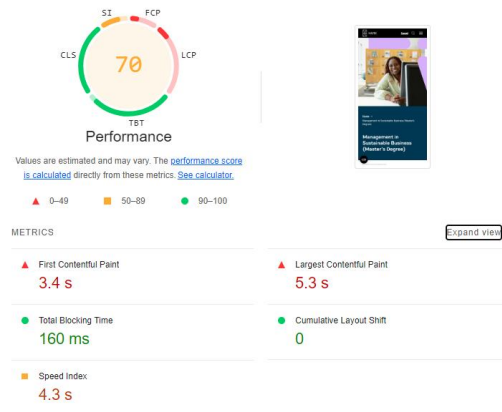


Figure 15 shows what kind of correction suggestions the Google Lighthouse report gives, which can improve the website's performance. Lighthouse has listed as things to fix The Largest Contentful Paint performance meter suggests improving the image's Time to First Byte time, load delay time, load time and render delay time. Eliminate render-blocking resources rendering delay, as well as removing rendering-blocking resources from the page. Preconnect to required origins is a function where a web page tries to establish a connection with third-party servers even before the page needs a resource. Reduce unused CSS and JavaScript tells you to remove unused CSS styles and JavaScript codes. Serve images in next-gen formats asks to change the format of the images on the page to the new generation formats WebP and AVIF. To minimize the load on the main thread. The main thread is the part of the browser that processes HTML code, parses CSS, builds the DOM, and executes JavaScript. Defer offscreen images delays loading off-screen images until they are needed. This improves web page load time and performance. (*Lighthouse, 2016*)

Figure 15. Google Lighthouse report mobile diagnostics (Google Lighthouse, 2024)

DIAGNOSTICS	
▲ Largest Contentful Paint element	— 5,270 ms
▲ Eliminate render-blocking resources	— Potential savings of 850 ms
▲ Preconnect to required origins	— Potential savings of 230 ms
▲ Reduce unused JavaScript	— Potential savings of 106 KIB
▲ Serve images in next-gen formats	— Potential savings of 17 KIB
▲ Minimize main-thread work	— 3.7 s
▲ Defer offscreen images	— Potential savings of 10 KIB
▲ Reduce unused CSS	— Potential savings of 52 KIB

In Figure 16, the website receives an accessibility score of 98/100 according to the Lighthouse report. The only correction suggestion report gives to titles that are not consecutive in descending order. (*Lighthouse*, 2016)

Figure 16. Google Lighthouse report mobile accessibility (Google Lighthouse, 2024)

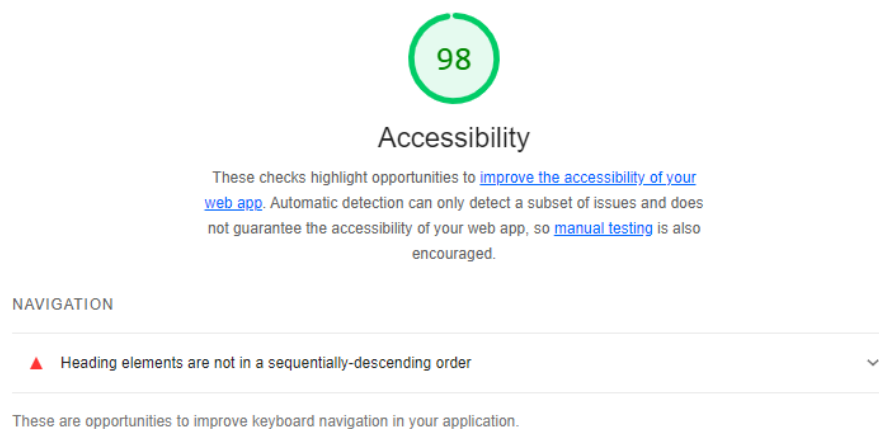
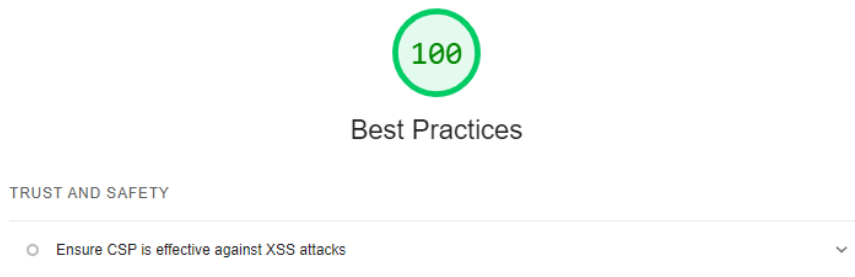


Figure 17 shows that, according to Lighthouse's report, the site's practices are at a good level, with a full score of 100/100. As an improvement, Lighthouse still suggests ensuring the content protection policy (CPS) is active and thus preventing script attacks. (*Lighthouse*, 2016)

Figure 17. Google Lighthouse report best mobile practices (Google Lighthouse, 2024)



According to the Google Lighthouse report, the website's SEO result is at a good level, with a score of 91/100. This means that the website is quite well indexed and can be found in search engines. Figure 18 shows how, despite a good result, Google Lighthouse's report suggests fixing links so that search engine crawlers can index the links. The mobile view also receives a correction prompt for the inappropriate size of tappable icons. (*Lighthouse*, 2016)

Figure 18. Google Lighthouse report mobile SEO (Google Lighthouse, 2024)

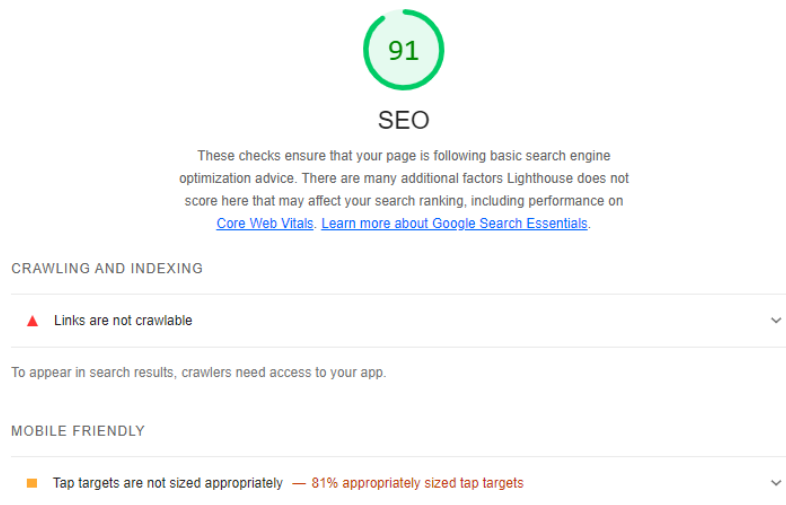


Figure 19. Result summary

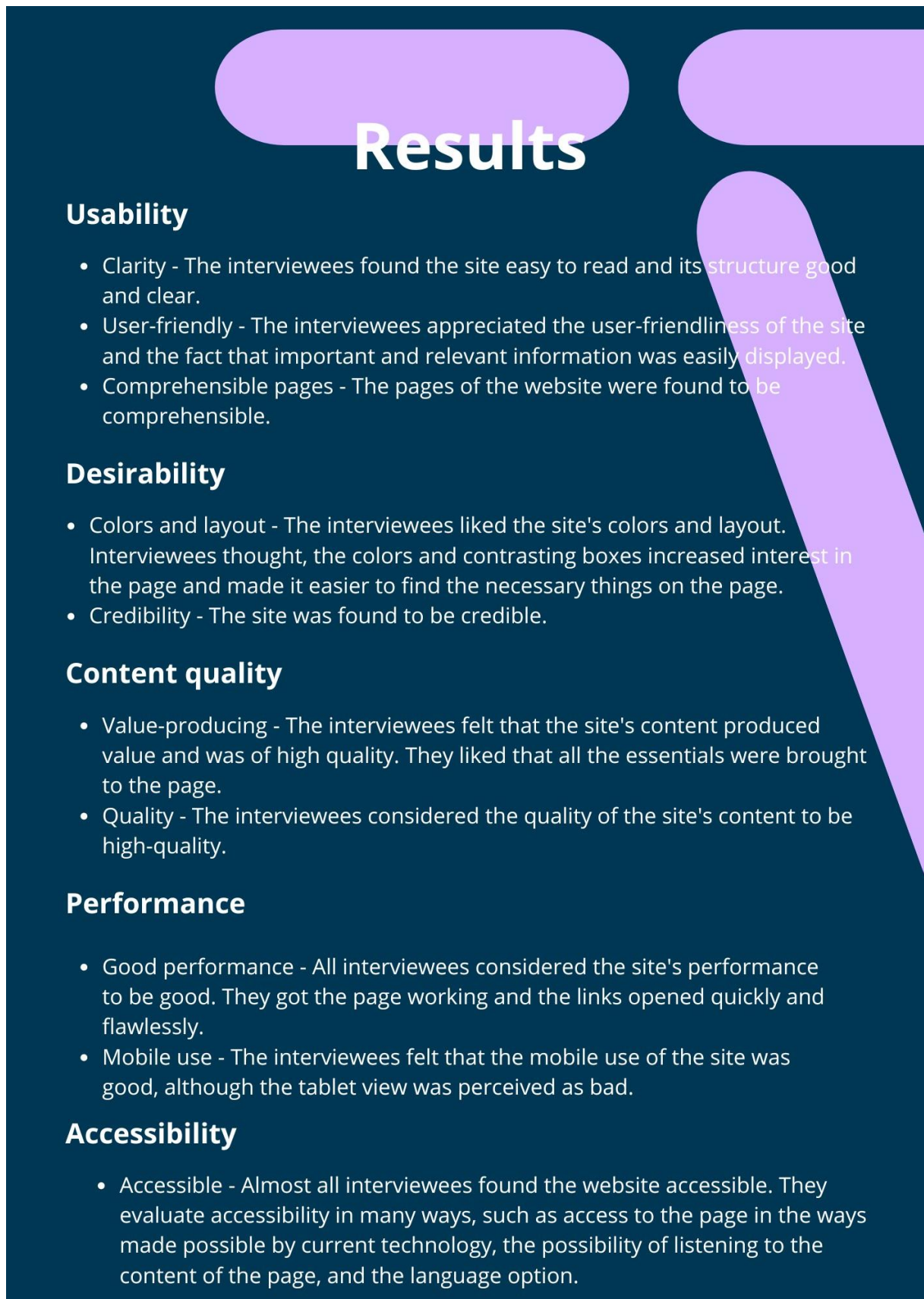
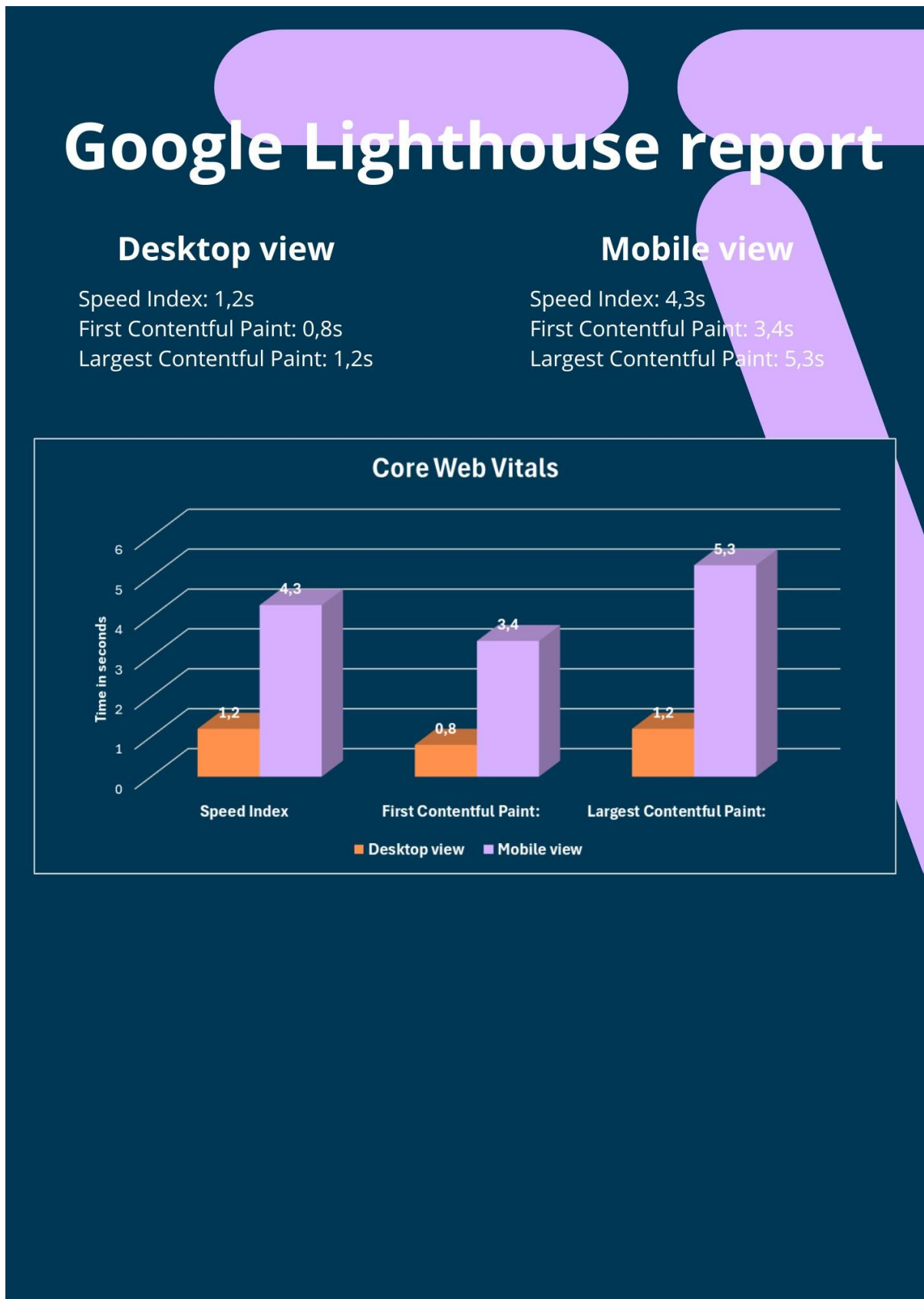


Figure 20. Result summary



5 Discussion

Qualitative research was used to gather valuable information about the user experience of the website and how website users experienced the user interface. Quantitative research was used to produce objective data about the website's performance. With the help of the research results, research material was obtained that answered the research questions, but also created good suggestions for improvement.

The interview responses show that the users' experiences correspond well with Morville's honeycomb theory. The areas of the honeycomb theory have an impact on how users experience the use of a website. A big impact on the user experience also comes from the usability of the user interface, which is supported by Nielsen's usability theory. From the angle of search engine optimization, the Lighthouse report shows the importance of technical optimization to search engine visibility and performance.

Based on the interviews, it can be concluded that there is a lot of good in the user experience of the website, but there is also room for improvement, especially in the tablet and mobile view. The interviews showed that users appreciate the clarity of the website, fast loading time and easy navigation. Although the interviewees found the page easier to read in the mobile view than on the computer screen, it was considered too long.

All the interviewees felt that the performance of the page was good, this experience was also supported by the report run with the Google Lighthouse tool. The performance of the page on the computer screen scored well, while the performance on the mobile view dropped significantly. In the mobile view, the performance degradation was not visible during the interview. The page worked just as well as on the computer screen.

5.1 Recommendations

Based on the research, suggestions for improvement can be made that the text at the top of the page could be formatted to be more user-friendly. The interviewees liked the colored boxes at the bottom of the page, which were pleasant to read, and the colors made it easier to navigate the page. Adding these boxes to the top of the page as well and including texts in the drop-down boxes increases the user experience and reduces the user's feeling overwhelmed by the length of the page. In the computer view, changing the list of study content on the upper left side of the page into links that lead further down the page, where

can be told more about the topic. Such links would increase the user-friendliness of the website and would be highlighted especially in the mobile view, where the content is overlapping. However, the interviewees considered the view of the website on a mobile screen to be clearer than on a computer screen.

The Lighthouse report gave the performance a good score. The performance of the website's mobile view, on the other hand, received a lower score and a list of suggestions for improving performance. Following the improvement suggestions will certainly improve the website's search engine ranking as well, because mobile usability is an important ranking factor for search engines.

In the future, more search engine optimization tools could be used in the analysis of the website, with which a wider sample of the research results can be obtained. A more in-depth analysis can be obtained when using website analytics tools. Conducting interviews with a larger sample and optimizing the target group deepens qualitative research. In the future, can also do research from what kind of effects the recommended corrections have in practice on the search engine visibility and user experience of the website.

6 Conclusion

In this section, the observations made in the research are gathered and the achieved results are evaluated, correction suggestions are made, possible further research are suggested and the factors that limited the research are highlighted.

The purpose of the research was to find out the current situation of the user interface, user-friendliness, and search engine optimization of Häme University of Applied Sciences' Management in Sustainable Business degree program website and to make suggestions for improvement based on the research.

From the results, we can conclude that the user interface and its functionality have an impact on the user experience. The results also show where room is for improvement. The results have brought an understanding of the current state of the webpage and what could be improved in the webpage. HAMK can use the research results in decision-making and website development.

The limiting factors of the research can be said to have been the small number of interviewees, so the sample is quite small. The backgrounds of the interviewees can also be

seen as limitations, that most of the interviewees are not the direct target group of the degree in question. However, the interviewees were able to evaluate the website's operation and user experience. The research could also have been expanded using more search engine optimization and analysis tools. However, time was a limiting factor to use all the tools and analyze the results. It can also be seen as a limitation that the research is primarily limited to one page of HAMK, instead of having research from the entire website. Another limitation comes from search engines, where the focus is on search engine optimization in the google search engine. Google is the most popular search engine in the world, so there is no need to spend resources on researching other search engines.

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Appendix 1. Interview questions

1. **Age:** How old are you?
2. **Gender:** Male, female, something else?
3. **Occupation:**
4. **Education:**
5. **Findability:** How easy is it for you to find the information you need on the website? What was especially convenient in finding the information?
6. **Usability:** How easy is the website to use? Do you encounter any problems when using it? What do you especially like or dislike about website usability?
7. **Desirability:** What do you think about the look and style of the website? Is it appealing to you? What do you especially like about the appearance of the website?
8. **Accessibility:** Do you find the website accessible for all users, including those with special needs? Which website components make it accessible? What could be improved?
9. **Usefulness:** How useful do you find the website? Does it meet your needs? What could be improved?
10. **Credibility:** Do you trust the information provided on the website? Why or why not?
11. **Value:** Do you find the website valuable? Does it provide value to you? Please briefly explain, what value it provides to you?
12. **Content Quality:** How would you evaluate the quality of the content on this website? Is the content informative and useful?
13. **Design:** How does the design of this website affect your experience? Is the design intuitive and user-friendly?
14. **Performance:** Have you ever noticed that the performance of this website (e.g., loading times) affects your experience?
15. **Understandability:** Have you ever had difficulties understanding how this website works or how it should be used?
16. **Mobile Usability:** How does the mobile usability of this website affect your experience? Is the site easy to use on mobile devices?

Appendix 2. Interview schedule

Interview schedule for the thesis.

Interviewee	Date	Time	Duration
Interviewee 1	12.4.2024	19:04 – 19:39	35 minutes
Interviewee 2	13.4.2024	13:03 – 13:41	38 minutes
Interviewee 3	13.4.2024	18:26 – 19:06	40 minutes
Interviewee 4	14.4.2024	13:00 – 13:25	25 minutes
Interviewee 5	15.4.2024	18:17 – 19:13	56 minutes

Appendix 3. Data management plan

Management and storage of research data

The data will be collected in the research section of the thesis is partly collected with semi-structured qualitative data, interviews and partly with quantitative data, with different kind of search engine optimization tools. The interviews are mainly conducted remotely, one interview is conducted face-to-face. All interviews are recorded and transcribed.

The material is stored on the author's own personnel computer. Outsiders do not have access to the data.

Processing of personal data and sensitive data

Research data is not published in connection with the thesis. The data does not include sensitive or confidential information. In connection with the interview, only general demographic information, and information relevant to the study have been asked from the interviewees. The processing of personal data complies with the EU's general data protection regulation (2016/679) <https://www.hamk.fi/en/privacy-policy/>.

Ownership of thesis data

The data and results of the thesis is owned by the author of the thesis, Maria Huhtala.

Further use of thesis data after the work is completed

The data of the research will not be used for anything other than this one thesis. The data of the research is stored on the hard drive of the thesis author's personal computer for one year for a possible review of the data. One year after the thesis has been approved, the data of the research will be permanently deleted.