Master's thesis

Master of Culture and Arts, Creative Design Management

2024

Iuliia Kalinkina

Creation of Web Accessibility Guidelines for an organization and analyzing their impact on the workflow

TURKU AMK
TURKU UNIVERSITY OF APPLIED SCIENCES

Master´s Thesis | Abstract
Turku University of Applied Sciences
Master of Culture and Arts, Creative Design Management
2024 | 68 pages
Iuliia Kalinkina

Creation of Web Accessibility Guidelines for an organization and analyzing their impact on the workflow

This thesis explores the development of web accessibility guidelines for Siili Solutions Oyj, a leading digital services company. Through thorough research and interviews with specialists from diverse backgrounds within the company, the current needs and challenges regarding accessibility recommendations were identified. The study aimed to understand what benefits workers would derive from such guidelines. Subsequently, comprehensive Web Accessibility Guidelines were compiled.

To evaluate the effectiveness of the guidelines, a survey was conducted with 17 respondents. The survey focused on assessing the document from various perspectives, including Clarity and Comprehensibility, Coverage of Key Accessibility Areas, Practicality and Feasibility, Relevance to Various Design and Development Roles, Clarity on Priority Levels, Consistency with Industry Standards, and Practical Examples and Illustrations.

The survey findings provided valuable insights into the strengths and areas for improvement of the Web Accessibility Guidelines. Based on the survey results, the thesis concludes with recommendations for enhancing the guidelines, aiming to promote web accessibility within Siili Solutions Oyj further and contribute to a more accessible digital environment for all users.

Keywords:
Web Accessibility, Digital Accessibility, WCAG Guidelines, Automatic Accessibility Testing, Manual Accessibility Testing, Inclusivity, Assistive Technology

Opinnäytetyö (YAMK) | Tiivistelmä
Turun Ammattikorkeakoulu
Koulutus: Creative Design Management
2024 | 68 sivua
Iuliia Kalinkina

Webin saavutettavuusohjeiden luominen organisaatiolle ja niiden vaikutusten analysointi työnkulkuun

Perusteellisella tutkimuksella ja haastattelemalla eritaustaisia asiantuntijoita yrityksessä tunnistettiin saavutettavuussuositusten nykyiset tarpeet ja haasteet. Tutkimuksen tavoitteena oli ymmärtää, mitä hyötyä työntekijöille tällaisista ohjeista olisi. Tämän jälkeen laadittiin kattavat Web Accessibility Guidelines - ohjeet.

Ohjeiden toimivuuden arvioimiseksi suoritettiin kysely, johon osallistui 17 vastaajaa. Kyselyssä keskityttiin arvioimaan asiakirjaa eri näkökulmista, mukaan lukien selkeys ja ymmärrettävyys, keskeisten saavutettavuusalueiden kattavuus, käytännöllisyys ja toteutettavuus, relevanssi erilaisiin suunnittelu- ja kehitysrooleihin, prioriteettitasojen selkeys, johdonmukaisuus alan standardien kanssa sekä käytännön esimerkit ja kuvitukset.

Kyselyn tulokset antoivat arvokasta tietoa Web Accessibility Guidelines - ohjeiden vahvuuksista ja kehittämiskohteista. Tutkimustulosten pohjalta opinnäytetyö päätyy suosituksiin ohjeistuksen tehostamiseksi, minkä tavoitteena on edistää webin saavutettavuutta edelleen Siili Solutions Oyj:ssä ja edistää digitaalisen ympäristön saavutettavuutta kaikille käyttäjille.

Asiasanat:

Webin saavutettavuus, digitaalinen saavutettavuus, WCAG-ohjeet, automaattinen esteettömyystestaus, manuaalinen esteettömyystestaus, inklusiivisuus, aputekniikka

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Abbreviations

AT- Assistive Technology

ARIA - Accessible Rich Internet Applications

DDG - Disability Discrimination Act

JAWS - Job Access With Speech (screen reader for Windows OS)

NVDA - NonVisual Desktop Access (screen reader for Windows OS)

POUR - Perceivable, Operable, Understandable, Robust

UX / UI design - user experience/user interface design

VO - VoiceOver (screen reader for macOS and iOS)

WCAG - Web Content Accessibility

W3C - World Wide Web Consortium

WAI - Web Accessibility Initiative

1 Introduction

1.1 Background and Rationale for the Study

In the modern digital landscape, web accessibility has become a primary consideration for businesses striving to create inclusive and equitable online experiences. As the virtual landscape continues to grow and transform, ensuring that websites, applications, and digital content are accessible to all individuals, regardless of their limitations, is an ethical responsibility and a legal requirement in most countries.

This thesis explores web accessibility, focusing on its significance within the framework of Siili Solutions Oyj. As a leading digital services company, Siili Solutions Oyj recognizes the pivotal role of web accessibility in its projects and endeavors to create guidelines that empower its employees to design and develop inclusive digital solutions.

Based on extensive research, the thesis aims to answer the question of how to create a comprehensive set of web accessibility guidelines for an IT company that would streamline the incorporation of accessibility in projects. Therefore, drawing upon the rich tapestry of inputs to be gathered through a literature review, an interview, and a survey, this document will focus on synthesizing key findings and recommendations into a cohesive set of guidelines.

The anticipated outcome of this thesis is to establish a robust framework of web accessibility protocols that not only align with international standards but also address the specific challenges faced by Siili Solutions Oyj's employees. This endeavor is expected to foster a culture of inclusivity and position Siili Solutions Oyj as a leader in accessible digital innovation. Through this comprehensive approach, the thesis will contribute to the broader discourse on digital accessibility, offering valuable insights for other organizations striving to improve their accessibility practice.

1.2 The Role of Web Accessibility Guidelines in Promoting Inclusive User Experiences

Over the past few years, the significance of web accessibility and its effects on individuals with disabilities have gained significant recognition. As the Internet plays a fundamental role in providing access to information, it is essential to ensure that web content is accessible to all individuals, including people with disabilities. Therefore, it highlights the need for ongoing improvements and revisions in designing and developing websites and applications.

All web accessibility guidelines are based on universal design principles. This set of concepts and guidelines aims to create products and environments everyone can use to the greatest extent possible without needing adaptation. This approach not only aids individuals with disabilities but also benefits older adults, individuals living in rural areas, and others who might experience limitations in web usability (Badzio et al. 2022, 63-64).

By adhering to web accessibility guidelines, designers and developers enable users to fully engage in online activities, access important information, and utilize digital services. For example, they play a crucial role in facilitating education by providing access to online learning platforms and expanding academic advancement opportunities. Additionally, they improve the chances of people with limitations to secure employment by enabling access to online job portals, thus fostering greater economic independence and inclusion.

Accessible web design also plays a vital role in ensuring all individuals can access essential online services, including healthcare, online banking facilities, and government portals. Therefore, by eliminating barriers, web accessibility enables people to use these services independently and efficiently. The commitment to web accessibility ultimately benefits society by creating a more inclusive and equitable digital environment where anyone has equal access to vital resources and opportunities regardless of ability (eAccessibility of Public Sector Services in the European Union, 2005).

1.3 Enhancing Digital Inclusion through Web Accessibility Guidelines

According to the World Health Organization (WHO), around 1.3 billion people, equivalent to 16% of the world's population, had some form of disability in 2024. This number has increased from 1 billion in 2022, mainly due to the aging of the population (World Health Organization, 2024). As a result, businesses need to shift their mindset when developing online services to serve individuals with disabilities better.

Web accessibility protocol is an explicit roadmap for creating inclusive user experiences within the digital realm. Therefore, providing recommendations that outline accessibility directives and technical specifications can optimize the work of company specialists regarding accessibility. Well-structured accessibility guidelines will serve as an excellent aid for maintaining compatibility across different devices and platforms.

By integrating web accessibility directives promptly into the workflow, Siili Solutions Oyj aims to empower its specialists to prioritize accessibility at every stage of the product development process. This proactive strategy will ensure that final products/services align with global legal requirements and ethical standards in digital development.

The compiled web accessibility protocol will be published online on Siili Solutions Oyj’s intranet, ensuring all team members have easy and immediate access to the necessary resources. This centralized approach will allow for consistent implementation of accessibility practices across the company's various projects and platforms.

2 Research Approach

2.1 Establishing Research Methodology

This study examines the development of web accessibility guidelines at Siili Solutions Oyj using a case study methodology. The choice of a case study approach allows for a thorough investigation into Siili Solutions Oyj’s unique requirements and challenges in integrating accessibility within their projects. This approach is pivotal for pinpointing specific accessibility issues and assessing their potential adverse effects on the company's operations and productivity.

The case study technique provides an in-depth, complex understanding of the unique conditions at Siili Solutions, which is crucial for formulating compelling and actionable guidelines suited to the specific nature of projects within the organization. It gathers rich qualitative data via interviews, observations, and analysis of documents. Such detailed data is critical in comprehending the intricate effects of web accessibility guidelines on the workflows of various stakeholders, including developers, UX/UI designers, and sales professionals.

Additionally, the case study format allows for flexibility in addressing emerging issues and adapting to new insights, which is particularly beneficial in the dynamic field of web accessibility. By closely engaging with Siili Solutions Oyj's daily operations and strategic objectives, the research not only highlights the current state of accessibility but also allows for future-proof decisions. Thereby, it supports Siili Solutions Oyj's devotion to maintaining its commitment to inclusivity and excellence in digital environments.

In conclusion, the case study method facilitates a focused and exhaustive evaluation of web accessibility awareness at Siili Solutions Oyj. It also enhances the relevance and practicality of the research findings and contributes to the broader academic and practical discussions on web accessibility.

2.2 Establishing Theoretical Foundations in Web Accessibility

After setting goals and objectives for creating an accessibility protocol, the document will incorporate theoretical analysis, consisting of two stages: primary and secondary research. The initial phase will begin by examining existing literature on accessibility, including academic papers, industry reports, and current standards established by regulatory bodies (Figure 1). The review will help identify the prevailing trends, challenges, and best practices in web accessibility relevant to Siili Solutions Oyj's specific operational context.

That phase will help establish a robust knowledge base regarding current leading approaches in web accessibility. The research aims to scrutinize the data regarding several vital topics, such as user experience design for individuals with disabilities, compliance with legal requirements, and the implementation of assistive technologies, such as JAWS, NVDA, and VoiceOver, and describe the peculiarities of their application.

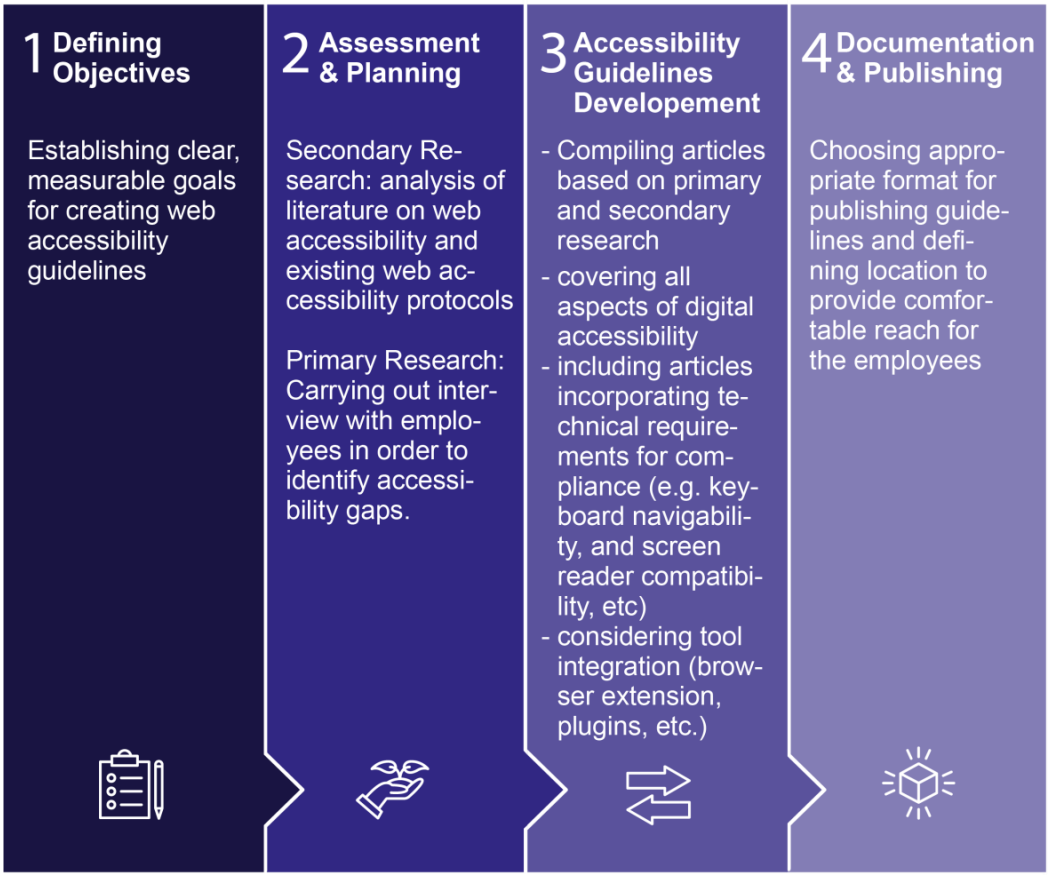

Figure 1. Framework for Creating Web Accessibility Guidelines.

The initial stage will also include a comparative review of prominent international and domestic web accessibility protocols. An exhaustive review of those standards will become paramount for comprehending, organizing, and displaying accessibility practices, recommendations, and standards in Siili Solutions Oyj's web accessibility guidelines. Furthermore, benchmarking through evaluating established documents will provide a comparative perspective, helping identify gaps and areas for improvement in the current framework of the stakeholder's organization.

The secondary analysis will also determine the ethical and legal implications of web accessibility requirements for businesses operating in Finland. Moreover, it will help define how to ensure the sustainability and ongoing effectiveness of accessibility initiatives in the evolving digital landscape. Adherence to such universal design standards will assist in aligning the company's practices with globally recognized benchmarks and ensure compliance with the most recent and rigorous accessibility criteria.

2.3 Primary Research Methods and Data Collection

After establishing a comprehensive theoretical foundation, research data was collected. The research methods involved engaging directly with employees through interviews and surveys to gather qualitative and quantitative insights. This hands-on approach helped to identify specific challenges and opportunities related to web accessibility within the organization, allowing for the creation of tailored and practical solutions.

The main goal of the primary research was to receive a comprehensive review of Siili Solutions Oyj's specific needs and requirements, which was crucial for pinpointing the essential concerns and topics to be addressed. The research started by considering factors such as the company's target audience, the nature of products and services produced by Siili Solutions Oyj, and any legal obligations or industry-specific protocols applicable to the organization. The collection of this diverse data enriched the research and provided a solid base for developing effective strategies to enhance web accessibility.

Data collection for this study was carried out using multiple methods to ensure an exhaustive knowledge base. Firstly, semi-structured interviews were

conducted with key stakeholders, including web developers, UI/UX designers, and sales specialists. These interviews have helped to gather qualitative insights into the personal experiences and professional challenges of web accessibility. In addition, observational studies were carried out within different departments to understand the practical application of existing web accessibility standards and to identify knowledge gaps.

2.4 Data Analysis and Validation

The collected input was analyzed using a mixed-methods approach. The interviews were recorded, transcribed, and reviewed using a coding method that arranged research findings into patterns and themes. The data was interpreted by linking the themes to the research questions and the broader theoretical framework of the study. Thus, study results were checked against the observations from multiple literature sources, including academic reports, existing accessibility guidelines, and publications from the international community—the World Wide Web Consortium (W3C). This method ensured the results were applicable and useful in real-world settings. This comparison served as a critical validation tool, enhancing the credibility and depth of the findings.

In addition, the data collected through primary and secondary research allowed for identifying consistency and accuracy discrepancies between subjective personal reports from interviews and objective data from surveys, providing a more reliable and nuanced understanding of the web accessibility challenges at Siili Solutions Oyj. By rigorously applying these comparison practices, the research ensured that the conclusions drawn are robust, well-supported, and reflect a thorough examination, thus providing Siili Solutions Oyj with reliable insights to inform their accessibility strategies.

3 Conducting an In-depth Analysis of Accessibility Studies

3.1 Focused Nature of Web Design

The visual-centric approach in web design has been crucial in online communication, helping shape user experiences and brand perceptions. However, with the increasing importance of digital accessibility, it is imperative to balance visual aesthetics and inclusivity for all users, especially those with disabilities.

Web design has always relied on visual elements such as layout, color, typography, and imagery to engage users and convey information effectively. Equally essential is ensuring that websites are also accessible to people with disabilities. Numerous approaches can help accomplish that, for example, by providing alternative options such as alt text descriptions for images, appropriate color contrasts, and keyboard navigation.

With an estimated 55,000 visually impaired individuals in Finland alone (Tolkkinen, 2022) ranging from partial sight to total blindness, addressing accessibility issues becomes paramount. Therefore, it is strongly advocated that websites be designed to meet the needs of visually disabled users, emphasizing the importance of enabling assistive technologies like screen readers and keyboard navigation. (Ojamo and Tolkkinen, 2020, 5.)

In addition to complete blindness, color blindness or Color Vision Deficiency (CVD) affects how individuals perceive colors (Figure 2). CVD is impacting around 300 million people worldwide, according to Colour Blind Awareness. CVD includes several types, the most common being deuteranopia, protanopia, tritanopia, and monochromacy. Thus, protanopia diminishes sensitivity to red light, deuteranopia reduces sensitivity to green light, tritanopia alters the perception of blue light, and monochromacy represents a total or near-total loss of the ability to distinguish all three primary colors. (Ryan, 2023.)

Figure 2. Types of colour vision deficiency (Ryan 2023).

A critical example of designing with color blindness in mind is creating digital interfaces for emergency services. In such applications, it's vital that all users, regardless of their ability to perceive color, can quickly and accurately identify warning signals, status indicators, and actionable buttons. Given the importance of readability for users with partial blindness, suggesting suitable font styles and color contrast and using additional information than colors, for example, for marking errors (Figure 3), can have a significant impact, ensuring all users respond appropriately during critical situations, enhancing safety and effectiveness. To promote accessible solutions, designers can incorporate additional cues such as distinct shapes, icons, or patterns alongside color coding.

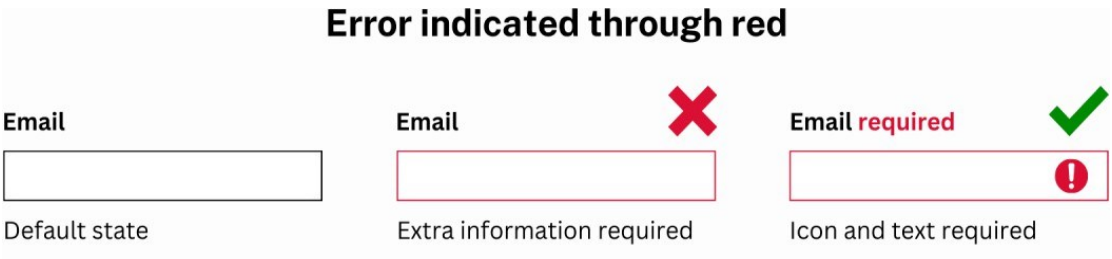

Figure 3. Correct and incorrect uses of an email validation error message (Ryan 2023).

Patterns and shapes significantly enhance design accessibility, as demonstrated by Trello's "color-blind friendly mode," which utilizes patterns instead of colors in labels (Figure 4). Such non-color cues make information accessible to individuals with color vision deficiencies. Furthermore, design elements like buttons and forms should incorporate features like high contrast, distinct borders and varied typography to be easily distinguishable without relying solely on color. (Tenbuuren, 2015.)

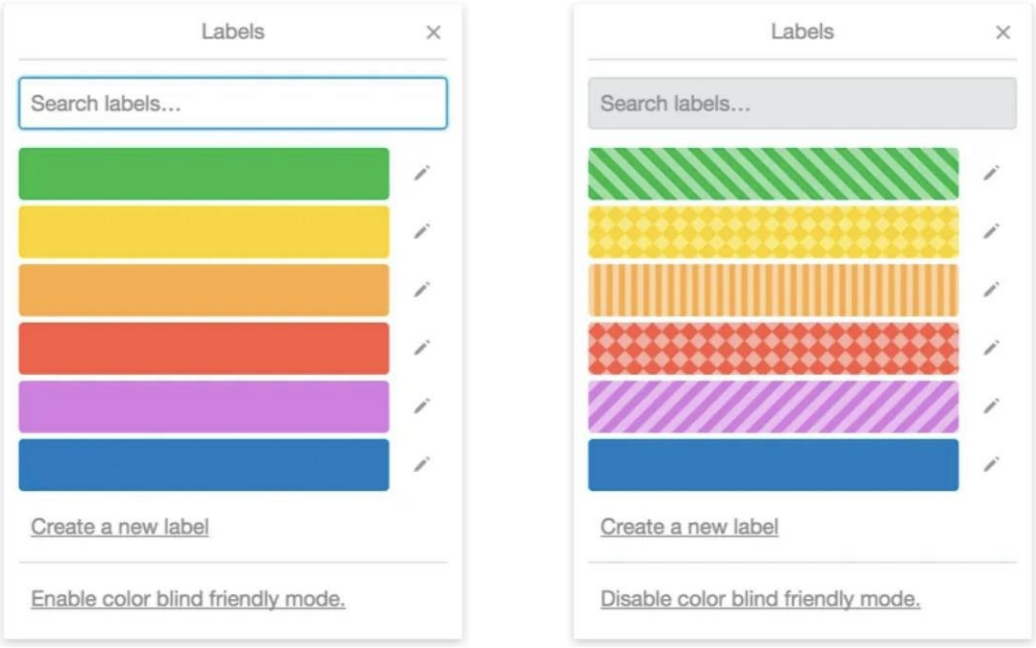

Figure 4. Designing for colorblind users by Trello (Tenbuuren, 2015).

Other approaches significantly enhancing accessibility include ensuring precise and consistent navigation structures, logical content organization, semantic markup, and appropriate link naming. Establishing the seamless functionality of interactive elements and providing captions or transcripts for multimedia content are essential steps toward promoting accessibility. (Abou-Zahra, 2023.)

In conclusion, integrating visual aesthetics with digital accessibility is critical in today's web design landscape. As the internet becomes increasingly essential In our daily lives, it is paramount to ensure that digital interfaces are inclusive, especially for users with disabilities such as visual and color vision deficiencies.

That approach enhances usability and fosters empathy and inclusivity, crucial for accommodating a diverse user base. Through thoughtful design that prioritizes accessibility, we can ensure that digital resources are equally available to all users, ultimately enriching the user experience and promoting more significant digital equity.

3.2 WCAG and Accessibility

Designing accessible digital services requires navigating a variety of limitations to ensure inclusivity. That involves accommodating users with physical, visual, auditory, cognitive, technological, and environmental restrictions. By offering

alternative input methods, prioritizing readability, providing visual alternatives, simplifying content, optimizing performance, and offering adjustable settings, designers can create digital experiences that are usable and inclusive for everyone. Prioritizing accessibility leads to a more equitable digital landscape where individuals of all abilities can engage fully and equally. (Harper and Yesilada, 2008, 3-4.)

Recognizing the importance of inclusive digital spaces, the Web Content Accessibility Guidelines (WCAG) have emerged as a pivotal framework for ensuring web accessibility. WCAG, developed by the World Wide Web Consortium (W3C), provides a set of principles, guidelines, and success criteria to make web content inclusive to people with disabilities. Its core principles — perceivable, operable, understandable, and robust (Figure 5) — form the foundation for designing websites and digital platforms that everyone can access and use, regardless of their abilities. (W3C, 2023.)

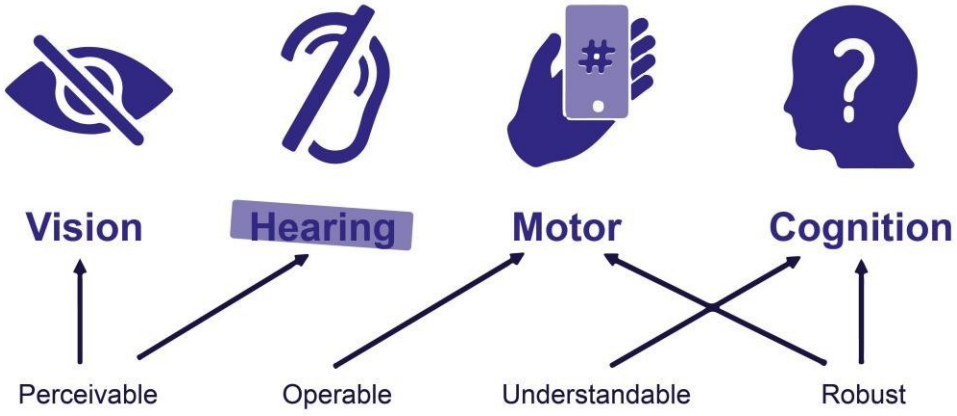

Figure 5. POUR principles (Karten Network, 2019).

Prioritizing web accessibility through WCAG compliance enhances a company's reputation and brand image. In an era where corporate social responsibility is paramount, demonstrating a commitment to inclusivity and diversity resonates positively with consumers, investors, and stakeholders.

The Web Content Accessibility Guidelines (WCAG) outline three conformance levels to help make web content accessible to a broader range of people with limitations (Figure 6). Level A is the minimum standard for most basic web accessibility features. Level AA includes additional requirements that address the common barriers for disabled users, making it the target standard for most

organizations to ensure broader accessibility. Level AAA offers the highest level of accessibility with the most comprehensive guidelines. These levels are designed to provide a standard for enhancing the accessibility of web content, ensuring it is operable and understandable for everyone. (Kirkpatrick et al., 2023.)

Adhering to the Web Content Accessibility Guidelines (WCAG) goes beyond mere compliance and fosters innovation and creativity in web design and development. This approach is essential for businesses to not only meet legal requirements but also to promote inclusivity, reach a broader audience, and uphold corporate responsibility.

Integrating accessibility into the design process encourages designers and developers to think creatively, resulting in innovative solutions that benefit all users, not just those with disabilities. This often leads to more streamlined, user-friendly interfaces that enhance the overall user experience. The drive to create accessible web content can push the boundaries of traditional design, prompting the adoption of new technologies and methodologies that improve usability and engagement for a diverse audience. (Adams, 2005.)

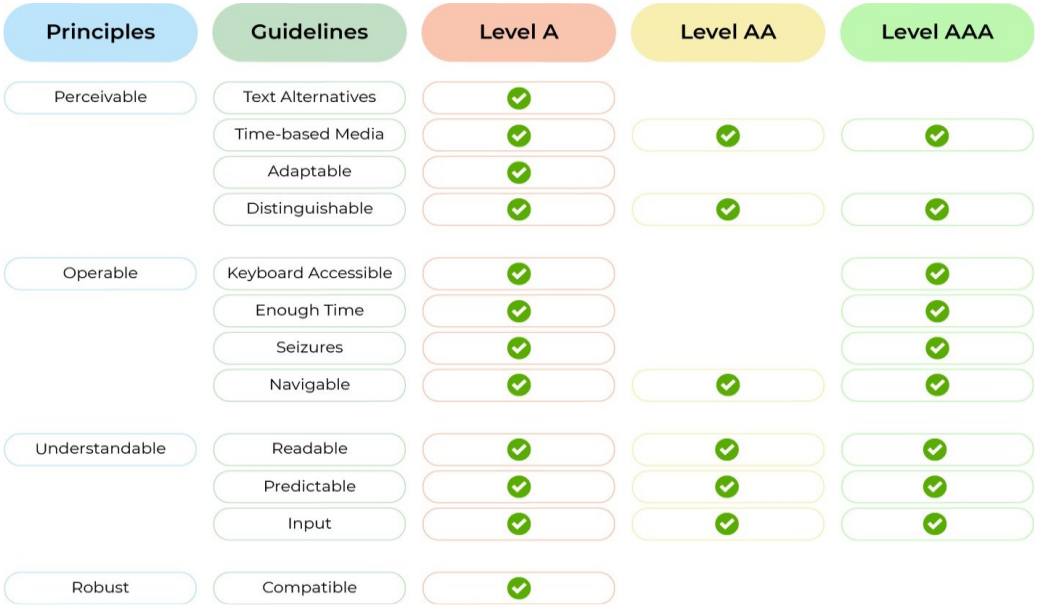

Figure 6. The structure of WCAG (Open Classrooms, 2023).

Moreover, businesses that prioritize accessibility can differentiate themselves in the competitive digital landscape. By viewing accessibility as an opportunity rather than a constraint, companies can build a positive brand reputation,

expand their user base, and foster customer loyalty. This inclusive approach aligns with corporate social responsibility and demonstrates a commitment to all users, which can enhance market reach and drive business success. (Christina E. et al., 2015.)

WCAG plays a pivotal role in shaping web accessibility guidelines for businesses. By embracing WCAG principles, companies can create digital experiences that are inclusive, user-friendly, and aligned with their values (Figure 7). In doing so, they not only comply with legal requirements but also unlock many benefits, from expanding their audience reach to enhancing their brand reputation. In an increasingly interconnected world, accessibility is not just a moral imperative but a strategic advantage that drives businesses toward success in the digital era. (Aizpurua et al., 2016, 2-4.)

3.3 Assistive technologies

Assistive technologies, such as screen readers and screen modifiers, are indispensable tools that make the web more accessible to individuals with visual impairments. These technologies provide the necessary support to navigate, interact with, and access content on the internet, which is a vital resource for information, education, and communication.

Incorporating articles about assistive tools into web accessibility guidelines is crucial for ensuring the accessibility of digital content. Such inclusion helps web developers understand and implement features supporting assistive technologies like screen readers, braille terminals, and speech recognition software, enhancing site usability across various devices and platforms. It also promotes standardization, ensuring a consistent and reliable user experience, fosters innovation by keeping abreast of technological advancements, and aids in compliance with legal standards. Ultimately, detailed guidance on assistive tools educates and empowers developers to create more inclusive websites, aligning with ethical standards and improving digital accessibility for everyone. (Abou-Zahra and Brewer, 2017.)

Screen readers are software applications that allow individuals with significant visual impairments or those who are entirely blind to access text on a computer screen using a speech synthesizer or braille display. This technology works by

reading the information on the web page out loud using synthetic speech, allowing the user to listen to and understand the content without seeing it.

Some of the most popular, such as JAWS, NVDA, and VoiceOver, provide various features designed to meet users' diverse needs and preferences across different platforms. These tools parse a website's HTML code and convey text and essential information about elements such as images (via alt text), tables, and headings, thus helping users navigate complex web pages. (Yesilada, and Harper 2019, 321-322.)

Screen modifiers, such as ZoomText and Windows Magnifier, assist users with mild to moderate visual impairments by enhancing the visual output on computer screens. These tools allow for the magnification of text and images, customization of font sizes and color contrasts, and reduction of screen glare, significantly improving readability and reducing eye strain. Such modifications are crucial for enabling users to interact more effectively with digital content and navigate the web more easily.

The success of screen readers and screen modifiers is heavily dependent on the accessibility of the website itself. Websites that adhere to the Web Content Accessibility Guidelines (WCAG) provide a more seamless experience for users of assistive technologies. Properly labeled HTML tags, meaningful content sequencing, and avoiding reliance on visual-only elements are essential for screen readers to accurately interpret and convey the content. High-contrast color schemes and responsive design also enhance the usability for users relying on screen magnification tools. (Harvard University, 2024.)

Research has shown that integrating various assistive technologies, such as screen readers and magnifiers, into library services can significantly enhance information access for visually impaired students. These tools, when combined with accessible website design, create a more inclusive digital environment, enabling students to engage fully with academic resources. (Alabi and Mutula, 2020.)

Integrating screen readers and modifiers into web accessibility highlights the commitment to digital inclusivity. Developers and designers increasingly recognize the importance of creating websites that cater to the needs of all users, regardless of their physical abilities. By embracing accessibility

standards, the web can become a more inclusive space that empowers everyone to participate fully in the digital age. As technology continues to evolve, the hope is that future advancements will further refine these assistive tools, making them more intuitive and capable of providing even greater independence for users with visual impairments. (Yesilada and Harper, 2019.)

3.4 Regulations and Standards for Accessibility in Finland

Accessibility regulations and standards play an invaluable role in the modern digital world. They ensure that individuals with disabilities have equitable access to digital services in Finland. These legal and guideline-based frameworks aim to remove barriers and promote an inclusive environment across digital and physical domains.

The EU Web Accessibility Directive, officially known as Directive (EU) 2016/2102, mandates that websites and mobile applications of public sector bodies across the European Union must be accessible to people with disabilities, including older people. Enacted in 2016 (Figure 8), this legislation ensures everyone has equal access to online services and information provided by public entities. It covers all levels of public sector bodies, from local to state governments, and extends to organizations governed by public law. (Official Journal of the European Union, 2016.)

The directive aligns with the Web Content Accessibility Guidelines (WCAG) 2.1 at Level AA, incorporating standards to assist users with various disabilities. EU member states monitor and report on compliance and have designated bodies to enforce these requirements, promoting a more inclusive digital space within the public sector. (Akinyemi 2023.)

As of April 1, 2019, the EU Web Accessibility Directive was incorporated into Finnish law. This integration ensures that Finland's public sector websites and mobile applications meet the accessibility standards specified in the directive, aligning with the broader EU mandate to make digital services accessible to everyone, including people with disabilities. (Bureau of Internet Accessibility, 2023; Finnish Ministry of Foreign Affairs and Health, 2024.)

Finland follows internationally recognized standards, such as the Web Content Accessibility Guidelines, which are commonly regarded as best practices and are increasingly incorporated into national accessibility legislation. Moreover, the country adheres to the Non-Discrimination Act, and the Act on the Provision of Digital Services that mandates digital accessibility across all public sector bodies. (Regional State Administrative Agency, 2023.)

Figure 7. Timeline depicting accessibility directives' adoption in Finland

Finnish legislation, like the Act on the Provision of Digital Services, is customized to address the country's specific accessibility requirements. It focuses on digital communication, public services, and transportation. This Act requires that public bodies provide accessible electronic services that facilitate ease of use for all citizens, including those with disabilities. (Häme University of Applied Sciences 2022.)

By complying with these standards and regulations, organizations in Finland not only enhance their service offerings but also reinforce the rights of all individuals to access and use services without facing discrimination. As technology and societal needs evolve, Finnish standards for accessibility continue to advance, meeting new challenges and creating opportunities to increase accessibility in every aspect of daily life. (Regional State Administrative Agency, 2023.)

4 Analysis of Existing Web Accessibility Protocols

4.1 Selection Criteria for Web Accessibility Guidelines

During the evaluation of Accessibility Guidelines from acclaimed organizations and companies, essential recommendations were identified. The goal was to distinguish the best practices for developing an effective accessibility protocol. Moreover, established materials and guidelines that proved their practical significance were carefully included, too. This process became the foundation for selecting the most suitable approaches to structuring information within the Web Content Accessibility Guidelines for Siili Solutions Oyj.

During the analysis, accessibility guidelines from prominent organizations like Apple and Microsoft and protocols from leading tech companies like Eficode and Future were evaluated. This review encompassed international and local perspectives, with two guidelines examined by global tech leaders and another two from regional innovators in accessibility. This approach was essential for developing an effective accessibility protocol for Siili Solutions Oyj.

Incorporating these established guidelines demonstrated their importance and helped to define proven practices. This process laid the foundation for structuring the Web Content Accessibility Guidelines to efficiently support user experience, address diverse user needs, and secure inclusivity and equitable access across different platforms and projects.

Ensuring that the study's findings align with current best practices in accessibility was paramount. Additionally, structuring the document was vital to developing accessibility guidelines, considering a diverse range of user groups with various limitations and disabilities. Crafting these guidelines required a deep understanding of the challenges and barriers faced by individuals with disabilities and limitations. By recognizing the unique demands of various user groups, the guidelines could be tailored to foster inclusivity and guarantee equitable access to information, services, and opportunities.

Moreover, it was imperative to confirm that the resulting document applied to real-world projects and could accommodate the requirements of designers, front-end developers, and other team members involved in implementing

accessibility measures. Therefore, web accessibility guidelines aimed to provide comprehensive solutions, facilitating comparative evaluations of their impact on user satisfaction, usability, and engagement throughout all project development and completion stages.

4.2 A Comparative Analysis of Web Accessibility Guidelines from Acknowledged Leaders in the IT Industry

Exploring the accessibility protocols of industry giants like Apple and Microsoft yields valuable insights and inspiration, aiding in developing comprehensive and effective guidelines tailored to the company's specific needs and objectives. Comparing the approaches of two major technology companies with significant influence in the industry to accessibility allows to gain a broad perspective on innovative strategies for promoting digital inclusivity.

Microsoft's and Apple's accessibility guidelines cover various aspects of digital accessibility, including user interface considerations, compatibility with assistive technologies, and content perceivability, operability, and understandability. Comparing these guidelines assists in identifying themes and proven approaches to incorporate into its own guidelines.

Microsoft's *Inclusive Design Guide* prioritizes universal design principles, aiming to create products and services that can be used by a wide range of people without needing any special changes (Microsoft Inclusive Design, 2024). Similarly, Apple's *Designing for Accessibility* ensures that individuals with disabilities can access technology barrier-free, focusing on integrating features like VoiceOver and Switch Control to support users with diverse needs. These approaches highlight both companies' commitment to fostering an inclusive digital environment, setting a benchmark for accessibility standards across the industry. (Accessibility, 2024.)

Ultimately, Microsoft and Apple exemplify a shift in the technology industry where accessibility is integrated into the core of the design process, recognizing the importance of continuous improvement and innovation in accessibility, encouraging other industry players to adopt similar practices, and contributing to a more inclusive digital future. (Microsoft Inclusive Design, 2024; (Accessibility, 2024.)

4.2.3 Summary

While comparing Microsoft's *Inclusive Design Guide* and Apple's *Designing for Accessibility Guidelines*, the examination was focused on both guidelines' core principles, design strategies, and recommended practices. It became clear that there are notable differences in the approaches and priorities of those protocols. For instance, comprehensive and widely applicable. Microsoft's *Inclusive Design Guide* highlights the significance of universal design. Microsoft aims to make products and services accessible to people with various abilities without additional alterations. Microsoft's recurrent collaboration with accessibility experts and collection of feedback from users with disabilities reflects its commitment to addressing the community's diverse needs.

On the other hand, Apple's approach to accessibility in *Designing for Accessibility* is characterized by its seamless integration of accessibility features into its ecosystem of products and services. Apple emphasizes and brings to the forefront multiple accessibility features deeply embedded across all Apple platforms, including iOS, macOS, watchOS, and tvOS. This cohesive integration ensures consistency and familiarity for users across different devices.

Moreover, Apple is using key features like VoiceOver, AssistiveTouch, and Magnifier to empower users with disabilities. At the same time, Microsoft covers a wide range of accessibility features, emphasizing areas like speech recognition, eye tracking, and keyboard shortcuts to enhance usability.

In addition, both corporations provide extensive developer resources, including accessibility APIs, guidelines, and testing tools, to support the creation of accessible apps and content. Apple and Microsoft actively engage with the accessibility community and collaborate with organizations to promote awareness and improve accessibility standards.

While both Microsoft and Apple prioritize accessibility in their unique ways, there are areas where their approaches converge. Both companies recognize the importance of continuous improvement and innovation in accessibility, regularly updating their guidelines and features to incorporate the latest

advancements and insights. Moreover, both Microsoft and Apple provide valuable resources and support for developers, empowering them to create more inclusive digital experiences.

4.3 A Comparative Analysis of Web Accessibility Guidelines of Finnish IT Companies

When developing customized accessibility guidelines tailored for a specific company, examining its documentation from related industries is imperative to gain insights and inspiration. In this pursuit, *Accessibility of Digital Services* by Eficode, a Finnish IT company specializing in software development enhancements, stands out as a notable example. This guide is a comprehensive resource, reflecting Eficode's steadfast commitment to fostering inclusive digital experiences for users of all abilities (Eficode 2018).

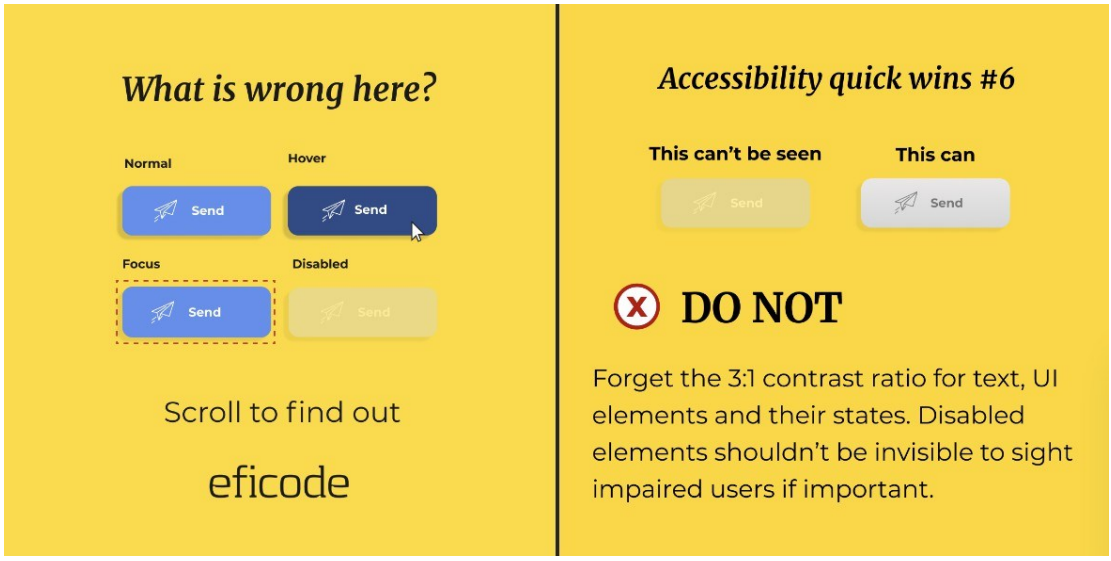

Figure 8. Accessibility recommendations regarding button design (Eficode 2018).

Eficode accessibility guidelines have a clear structure and comprehensive information regarding relevant laws, regulations, and accessibility standards that the guidelines aim to meet. They offer a great learning base regarding accessible design principles and considerations for designing accessible user interfaces, including guidance on visual components, layout, color contrast, typography, and responsive design (Figure 9). (Eficode 2018.)

Furthermore, it accentuates the recommendation for creating accessible interactions, such as keyboard accessibility, focus management, logical tab

order, and intuitive navigation structures. The guide also provides recommendations for making digital content accessible. Those proposals include guidelines for alternative text for images, video, and audio accessibility, creating proper semantic markup, handling, etc.

Digital Accessibility highlights the importance of accessibility testing and includes recommendations for accessibility assessment using various tools and sharing techniques and methods that can help ensure compliance with accessibility standards. Finally, the document gives thorough guidance on creating accessible documentation and providing training to empower designers, developers, and content creators to incorporate proven accessibility practices. (Eficode 2018.)

A Finnish-based digital innovation consultancy and software engineering company, Futurice, has published another acclaimed web accessibility protocol. That document, *A Guide to Accessible Design for Connected Products and Services*, delves into the complexities of creating inclusive experiences in the Internet of Things. The guidelines emphasize a human-centric approach to projects and prioritize user experience, sustainability, and social responsibility. Futurice's web accessibility protocol provides an explicit and elaborate introduction to accessibility, considering the topic's ethical and business perspectives. (Future, 2021.)

Moreover, *A Guide to Accessible Design for Connected Products and Services* highlights difficulties one may face when designing accessible experiences in constantly changing circumstances. In addition to providing general recommendations for accessible design and coding, the guidelines also unfold essential design principles and clarify how designers can prevent common accessibility problems by examining miscellaneous scenarios. It also highlights the role of design in creating accessible solutions. (Future, 2021.)

A Guide to Accessible Design for Connected Products and Services follows a standard approach by providing recommendations around the main principle of accessibility—POUR (perceivable, operable, understandable, and robust). The following chapter thoroughly explains the principle and well-contemplated examples (Figure 10). (Future, 2021.)

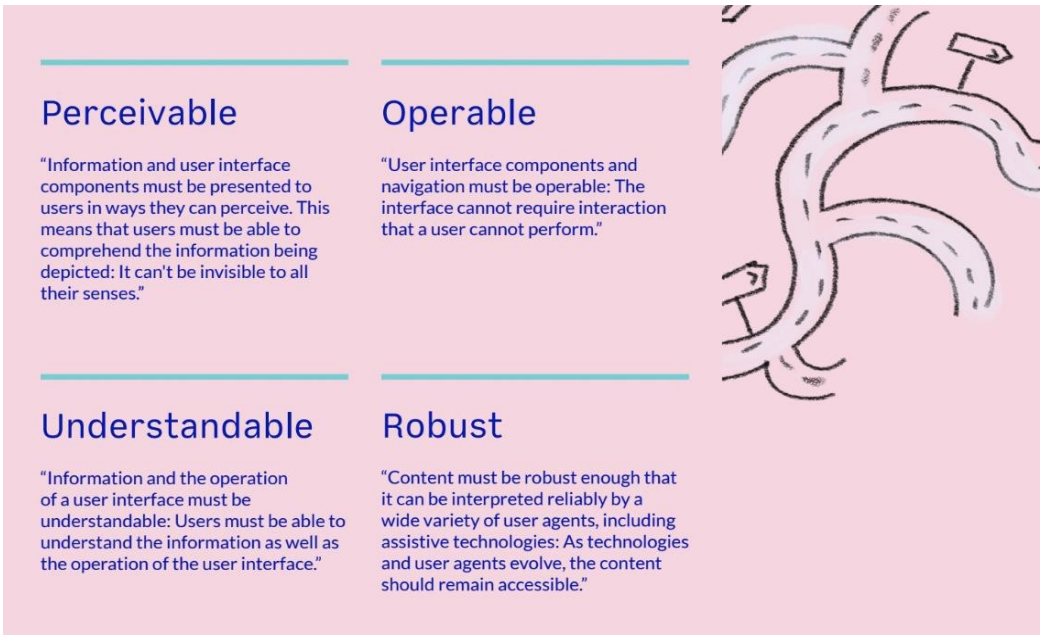

Figure 9. POUR principles of accessible design (Future, 2021).

For example, the chapter "Operability" describes designing products and services with alternative input mechanisms, and "Understandability" describes creating straightforward and understandable information and interactions within interconnected environments. At the same time, the section "Robustness" explains designing resilient solutions that consider interoperability and the long-term user experience. (Future, 2021.)

4.4 Summary of the Guidelines

By reviewing the accessibility guidelines provided by Eficode and Futurice, one can examine those organizations' core principles, design strategies, and recommended practices, considering their approach to inclusivity and alignment with industry standards like Web Content Accessibility Guidelines (WCAG). Comparing the companies' accessible guidelines, Eficode's *Digital Accessibility* focuses on creating digital products and websites that comply with international accessibility standards like WCAG. It emphasizes understanding user needs and conducting accessibility audits throughout the design and development.

On the other hand, Futurice's *A Guide to Accessible Design for Connected Products and Services* adopts a broader approach, not only addressing web accessibility but also considering accessibility in the context of connected

products and services. It emphasizes creating inclusive experiences across multiple touchpoints and devices.

The guidelines presented by Eficode prioritize user-centric design, putting users with disabilities at the center of the design process. The protocol encourages designers to involve users with disabilities in usability testing and conduct feedback sessions. These interactions would help identify the necessary changes to enhance accessibility.

Futurice's guidelines, on the other hand, advocate for a human-centric approach, considering users' diverse abilities and needs. They highlight the importance of empathizing with users' needs to create truly inclusive and meaningful experiences.
Regarding practical implementation guidance, Eficode covers aspects such as accessible color contrast, keyboard navigation, semantic HTML, and alternative text for images in the document. Futurice's guidelines are based on technical recommendations for designing accessible experiences on various platforms and devices, including mobile, wearable, and innovative home technologies.

In conclusion, Eficode's "Digital Accessibility" and Futurice's "A Guide to Accessible Design for Connected Products and Services" provide valuable insights and practices to promote web accessibility. Eficode prioritizes web accessibility compliance and user-centric design for digital products and websites, while Futurice takes a broader approach, considering accessibility across various connected products and services. Synergizing the strengths of these two approaches allows the creation of comprehensive guidelines optimally adjusted to the Siili Solution Oyj organization's needs.

5 Identifying Discrepancies in the Accessibility Process

5.1 Formulating Interview Questions for Qualitative Research

A qualitative research approach was used to ascertain the most appropriate content and structure for Siili Solutions' accessibility guidelines. This was an essential step for evaluating the organization's status of accessibility awareness among its employees. This research initiative was designed as a series of hour-long interviews. The primary objective of these interviews was to pinpoint any existing knowledge gaps about accessibility and to gather valuable insights to establish the guidelines that align with the company's unique requirements.

The questions for interviewing Siili Solutions employees were formulated to delve deep into various aspects crucial for understanding the organization's accessibility landscape (Appendix 1). The interview questions were carefully developed to uncover insights into employees' knowledge, experiences, challenges, and preferences concerning accessibility practices within the organization.

Through conducting semi-structured interviews, I endeavored to comprehend how stakeholders engage in accessibility decision-making and cooperate in prioritizing accessibility within projects. This insight ensures that accessibility is not overlooked and fosters practical cooperation among team members responsible for integrating accessibility into project workflows.

Research Method	Data Source	Date & Approach	Information Documentation	Purpose	Analyzing data
Semi-structured interviews	11 specialists from the company: -UX designers -front-end developers -sales specialist	Meeting face-to-face and through video calls, 60 min/ interview	Video-recording, transcription of the interviews	To understand average level of web accessibility awareness in the company, define knowledge gaps	Transcription, reading through, coding, developing themes, relating themes, validation, reflection of the results, presentation of findings to the stakeholders

Figure 10. Siili Solutions Oyj qualitative research process.

By observing employees' efforts to incorporate accessibility into projects, potential flaws and opportunities for improvement in early project planning stages were identified. This helped validate that accessibility should be considered from the start of the project rather than being addressed as an afterthought.

Lastly, insights into challenges encountered by employees and the strategies employed to overcome them provide valuable guidance for developing practical solutions within the accessibility guidelines. Effective communication strategies highlighted in these inquiries confirm clear and consistent communication of accessibility requirements throughout project lifecycles.

5.2 Data Collection Methods

A group of respondents was carefully selected to gain a deeper insight into the extent of accessibility awareness among Siili Solutions Oyj's employees. The interviewees were chosen based on the level of their accessibility awareness, involvement in projects with demanding accessibility requirements, strong interest in the subject matter, and comprehension of the current challenges associated with this process.

The research methodology involved engaging employees in face-to-face and video interviews across Siili Solutions' offices in Joensuu and Helsinki. Video interviews were recorded, and all interviews were transcribed and analyzed to identify knowledge gaps and determine stakeholders ' preferences regarding the content and structure of accessibility guidelines.

The interviews were conducted altogether with 11 participants representing such departments as product design (4), front-end development (5), and sales unit (2). The interview consisted of 10 questions to observe the current incorporation of accessibility practices into projects (Appendix 1). Furthermore, the research sought to evaluate participants' level of expertise in accessibility and identify their responsibilities regarding ensuring user inclusivity at different stages of projects.

The interviews were a valuable source for gaining comprehensive insight into Siili Solutions Oyj's need to integrate accessibility into projects. The

participants expressed solid aspirations for incorporating accessibility into projects and shared their vision for Siili Solutions' web accessibility protocol.

5.3 Analysing the Interviews

Analyzing a series of interviews was a pivotal step in the research process, which included several stages for detecting meaningful patterns and themes. The analysis aimed to uncover recurring themes and patterns, ensuring that valuable information was preserved. The interviews were transcribed and reviewed line by line to identify key points and notable observations.

Furthermore, a coding framework has been developed, marking segments of text that correspond to themes relevant to the research questions. In addition, I carried out a thematic analysis identifying repeating themes and patterns. (Appendix 1 Picture 5. Table—Sample from accessibility interview critical answer comparison.)

During the analysis stage, a labeling system was established to categorize information according to the topics in participants' responses. Codes often contained annotations visually representing the stages where accessibility practices were integrated, indicating the proficiency of employees, and highlighting the specific software, tools, and plugins utilized in the projects. As patterns emerged, connections between the most significant and frequently mentioned topics across the interviews were marked down.

After categorizing themes and counting the appearance of various categories, visualization techniques, such as allocating the research material into charts, enhanced data comprehension. Comparing responses across different interviews assisted in identifying similarities or disparities in respondents' opinions.

Following the data analysis, it was essential to interpret and synthesize findings, reflecting on the data. The research outcomes were presented to the stakeholders, preserving the anonymity of the participants to sustain their confidentiality.

5.4 Analyzing Research Data

The results of the interviews were classified into several principal themes. Some themes included receiving insights into employees' comprehension of accessibility's significance in the context of the company's operations. Another aspect of gathering information involved conversations regarding the effectiveness of training programs or resources to raise awareness about accessibility.

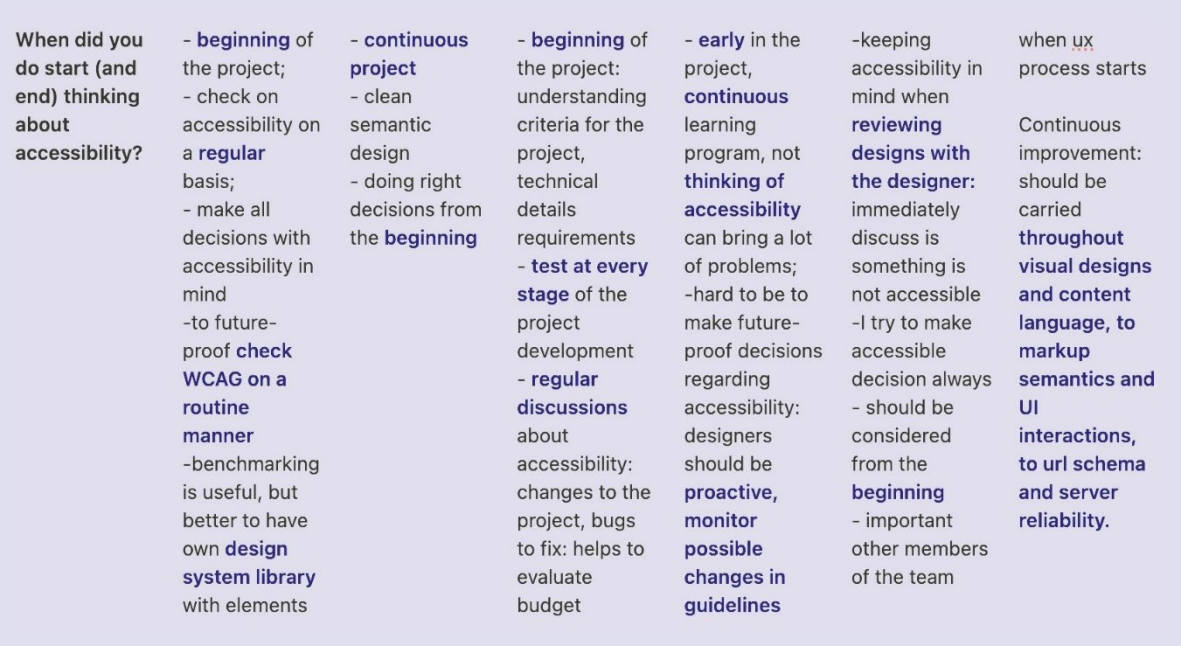

Figure 11. Analyzing the research data from the interviews, Siili Solutions Oy.

It was valuable to acquire employees' perspectives on the importance of accessibility in achieving organizational goals and serving diverse user needs. In addition, I aimed to identify the obstacles hindering awareness efforts, such as limited time and resources. Examination of the communicational channels through which accessibility information is shared between the employees, including formal communication channels and informal networks, was very beneficial, too.

Finally, the interview helped to pinpoint knowledge gaps that should be filled by offering concise yet comprehensive educational materials. That, in turn, laid the groundwork for improving employee expertise regarding accessibility, streamlining project work, and fostering seamless collaboration among departments.

5.5 Findings from the User Interviews

Several key findings emerged from the analysis of interview data. Firstly, it was evident that product designers and front-end developers demonstrated high accessibility awareness. In contrast, individuals in other areas of expertise, such as marketing, sales, and management, showed limited to no competence in the subject. The contrast in proficiency levels highlighted potential challenges in collaboration and project effectiveness, particularly regarding communication and resource allocation.

Additionally, the interviews revealed challenges encountered throughout the project process, including planning, scheduling, designing, and development. Many respondents emphasized the importance of discussing accessibility requirements for each project with team members from the outset, highlighting the need for improved communication practices within the organization.

Furthermore, the lack of documented guidelines and resources, such as accessibility audit report templates, checklists, and infographics demonstrating how to address specific issues, posed a challenge to employees. This finding underscored the need to develop and implement comprehensive documentation to display golden standards in accessibility incorporation.

Siili Solutions' employees expressed a keen interest in receiving practical advice, protocols, checklists, and forms to help them achieve accessibility goals. These findings highlight the importance of tailoring accessibility guidelines to address the specific needs and knowledge levels of different departments within the company. Many participants had actively researched accessibility requirements and were familiarizing themselves with any legislative changes regarding inclusive design.

In conclusion, the research provided valuable insights into Siili Solutions Oyi's current accessibility awareness and proficiency among employees. By addressing the identified challenges and implementing tailored accessibility guidelines and resources, the organization can enhance collaboration, improve project effectiveness, and create inclusive products and services that cater to diverse user needs.

5.6 Outlining Essential Chapters for Accessibility Protocol

Interviews revealed recurring themes mentioned by the participants. Among the most common topics was the creation of checklists assisting with integrating accessibility throughout projects. Other repeating themes included the need to establish effective communication with colleagues, challenges encountered during project planning, proposing strategies for addressing technical issues, and guidance on fostering successful dialogue within teams with sales consultants and project supervisors.

According to the interview, several subject matters regarding accessibility, such as POUR principles (perceivable, operable, understandable, and robust), the role of WCAG (Web Content Accessibility Guidelines), and legal and regulatory requirements, were considered essential chapters for the organization's accessibility guidelines. In addition, articles regarding ensuring proper semantic markup, sufficient color contrast assurance, protocols for multimedia usage on webpages, and providing assistive technology support were crucial for building the foundation of the guidelines.

In addition to offering detailed guides and checklists for integrating accessibility at each project stage, the interviewees highlighted several topics often overlooked when creating accessibility guidelines. One of the most aspired topics is benchmarking. Benchmarking is essential as it provides crucial viewpoints into best practices, design patterns, coding techniques, and compatibility with assistive technologies.

Benchmarking also enables employees to review how current accessibility standards are incorporated in other companies and identify the best usability, navigation, and interaction practices for all users, including those with disabilities. By benchmarking, the workers can sustain and help improve inclusive digital experiences for individuals with disabilities. Therefore, adding references to how other leading companies are incorporating accessibility into projects can be a very beneficial practice.

Another topic that has received multiple mentions from respondents was design systems. Design systems play a crucial role in creating accessible and inclusive digital experiences. They provide a framework and guidelines for

consistent organizational design and development practices. Thoroughly considered design systems provide comprehensive accessibility protocol within the design system documentation and can help accelerate workflow.

Finally, the interviews indicated the importance of continuous accessibility audits throughout the project's lifecycle. By integrating accessibility from the project's inception, the requirements can be accurately assessed, and appropriate boundaries can be set. Proper planning and resource allocation helps clients avoid additional costs, ensure improved usability, and mitigate the risk of legal repercussions.

6 Creating Accessibility Guidelines for Siili Solutions Oyj

6.1 Identification of Essential Parts of the Guidelines

Before formulating accessibility guidelines, it was crucial to establish the principles underpinning them. The main objective of creating accessibility guidelines was to provide a simple yet comprehensive document that would unify employees' knowledge base regarding the role of accessibility and the principles of its seamless incorporation into the projects. Furthermore, it was essential to provide clear examples of integrating accessibility principles at each project stage. The guidelines should be simple yet comprehensive, providing clear examples of accessibility integration and supporting educational resources for ongoing learning.

Defining the boundaries and limitations related to the scope of material for the guidelines was necessary for securing usability. It became one of the challenges during the guidelines' creation. The document's structure was set up by assessing the existing nature of the company's projects and identifying the employees' preferences, as revealed through the research. The guidelines should have a clear scope, set realistic goals, and be structured in a user-friendly manner with concrete examples.

The guidelines’ goal was to improve the clarity and consistency of interpretation of the most relevant terms and concepts in the field of accessibility, such as the main principles of web accessibility outlined in the Web Content Accessibility Guidelines (WCAG)—POUR ("POUR" stands for "Perceivable, Operable, Understandable, and Robust"). Furthermore, they reference internationally recognized standards like WCAG, incorporate best practices, and may include guidance on conducting accessibility audits.

The guidelines help employees understand and apply accessibility principles effectively by providing visual aids, examples, and contextualization. Additionally, they serve as a documented resource for decision-making and support education and training efforts within the organization. An essential topic that must be addressed in web accessibility guidelines is securing sufficient color contrast in projects. Therefore, providing tips on selecting

accessible color palettes, using appropriate contrast ratios, and testing designs with accessibility tools was essential.

Visual representations showcasing compliant and non-compliant color contrasts were incorporated to enhance the article's comprehensiveness. These illustrations effectively demonstrated the disparity in readability for users with accessibility requirements. Furthermore, the document featured valuable insights on crafting accessible color palettes and verifying designs using accessibility tools.

6.2 Utilising Analytics Tools for Enhancing Web Accessibility

Additional sections described the benefits of using analytic tools like Google Analytics. Google Analytics is an efficient Web analytics tool from Google that monitors and analyzes website traffic and user interactions. While Google Analytics is primarily used to understand website performance and user behavior, it also applies to UX (User Experience) design. It can analyze users' behavior while interacting with the website or app.

The guidelines also incorporate the roles and responsibilities of different teams or individuals involved in the development process, including developers, designers, testers, and content creators, and present pieces of advice for each group of users. It details UI components like buttons, forms, menus, and navigation elements. Furthermore, it addresses keyboard navigation, focus management, and providing clear and descriptive labels and error messages. In addition, the guidelines give hints on ensuring compatibility with screen readers, voice recognition software, etc.

Well-structured accessibility guidelines play a crucial role in promoting and improving web accessibility. They provide a standardized framework that helps website owners, developers, and designers understand what is required to guarantee that digital content is accessible to all, including individuals with disabilities. It leads to better user experiences, legal compliance, cost-effectiveness, and a positive brand image.

The guidance also includes links to additional articles, tools, or resources where readers can learn more about web accessibility, deepen their

understanding, and stay updated on best practices in the field. These resources also offer practical examples and case studies that illustrate successful accessibility implementations, helping to bridge the gap between theory and practice. Furthermore, they frequently update to reflect new technologies and changes in accessibility standards, ensuring that users always have access to the most current information.

6.3 Implementation Challenges and Barriers Associated with Creating Guidelines.

Developing accessibility guidelines involves numerous challenges. One of the most prevalent hurdles encountered during the process was the extensive range of information encompassing accessibility. Numerous technical and design limitations are encompassed within accessibility requirements. Thus, navigating and selecting the most appropriate information for the guidelines proved daunting.

Another challenge encountered when creating guidelines was including exhaustive recommendations for designers regarding some aesthetic constraints. Some policies may conflict with design considerations, such as aesthetic choices or branding requirements. Balancing the accessibility needs with the visual and design aspects of a website or application can be a challenge, requiring careful collaboration between designers, developers, and accessibility experts.

Researching the latest accessibility standards and best practices can be time-consuming, but it helps ensure that the guidelines offer up-to-date information. Besides, defining the scope of disabilities and targeting appropriate protocols has been essential due to the multiplicity and diversity of users' needs. Pursuing inclusivity and accommodating various user requirements can be particularly difficult when faced with format limitations. Therefore, it was essential to identify the company's needs first and prioritize recommendations catering to the employees.

Furthermore, selecting the document publishing format also posed a significant challenge. For example, creating guidelines as a printable document, such as a portable document format, electronic publication, or Word, can create

boundaries for the guide's seamless updates. Furthermore, such a format restricts users from quick information access due to the need to search for the table of contents that would inform which pages the information can be discovered.

Placing the document in HTML format, e.g., on a separate website, would be very convenient and could incorporate superb usability; however, it requires significant time allocation. Due to the scarcity of resources, publishing the guidelines on the company's inner portal has been chosen as an appropriate choice.

The distribution of accessibility guidelines has provided convenient access to the document for all company employees and opened up possibilities for modification and adaptation. The guidelines were published on Confluence, a collaborative software tool that seamlessly shares documentation, ideas, and other information among team members and throughout the organization. Readers can offer feedback by leaving comments, encouraging active participation and engagement.

7 Conducting User Survey on Accessibility Guidelines

7.1 Planning and Execution of User Research

Following the publication of the guidelines, a user survey was employed to assess the protocol's usability and the practicality of the information presented in the document. The study aimed to determine the clarity of guidelines' content and navigation and the relevance of provided information. Moreover, it helped to identify whether users received all the essential data for successful accessibility incorporation, leading to enhanced project flow. Detecting and resolving issues and inaccuracies were crucial steps of the evaluation process.

The user survey comprised nine queries, combining a mix of closed-ended (multiple choice, rating scales) and open-ended questions gathering quantitative and qualitative data. Multiple-choice questions provided predefined options, measuring contentment with the guidelines, and open-ended questions allowed to receive detailed feedback and insights from the participants.

Moreover, the survey followed the confidentiality requirements, with the pre-signed consenting to participate. The participants were assured that their responses would remain anonymous, encouraging honest feedback. In addition, project supervisors have pre-tested the survey before distribution to identify issues regarding its consistency and applicability.

Completing the survey was estimated to take approximately 10 minutes of the user's time. Participants were assigned to assess the clarity and effectiveness of the established accessibility protocol. Additionally, respondents evaluated the document's structure and writing style. The survey provided insights into whether the guidelines offered sufficient details and supported the theoretical base.

The survey was distributed through an online platform, Typeform, and promoted through the company's internal communication channels. Once the survey responses were collected, it was necessary to analyze the data to identify common patterns, trends, and insights from the content. Quantitative

data were summarized using statistical analysis, while qualitative data from open-ended questions were categorized and themed.

The survey results were communicated to the project supervisors, such as the Design Lead of the UX department in Joensuu and the Engineering Tribe leader from Siili Solution's Helsinki office. Furthermore, the essential survey findings and meaningful insights regarding suggestions for improvements and enhancements were presented to the stakeholders.

Ensuring the guidelines were comprehensive and well-supported was critical in the evaluation process. As it was initially assured, it was crucial to evaluate whether the guidelines cover a broad range of aspects and considerations related to accessibility, making sure that no vital areas are overlooked.

7.2 Analysis of Quantitative and Qualitative Data from the Survey

Siili Solutions Web Accessibility Guidelines were developed as an internal document to promote web accessibility within the organization. This thesis report presents a survey analysis based on responses from Siili Solutions Oyj's employees, focusing on the clarity and comprehensibility of these guidelines.

17 employees participated in the survey on Siili Solutions Web Accessibility Guidelines. The survey results were placed in a table to provide a clear and concise overview, highlighting areas where the guidelines excel and others that could be improved.

The table summarizing the results from the Siili Solutions employee survey on accessibility guidelines presents data in a structured format that identifies strengths and areas for improvement. The rows are systematically arranged by survey category, and within each, the responses are detailed in terms of quantitative scores and qualitative feedback distribution. This approach offers an intuitive understanding of how well the guidelines perform across different evaluation criteria.

The survey results indicate that while the guidelines are generally well received in terms of clarity and practicality, there is a distinct need for improvements in comprehensiveness and specificity, particularly concerning the coverage of accessibility aspects and relevance to various roles. The practicality score

suggests that the guidelines are feasible to implement, yet the mixed feedback on balancing accessibility with practical considerations highlights an area for closer review.

Survey Section	Metric / Question	Results
1. Clarity and Comprehensibility	Ease of Understanding Score (1-10)	7.8
	Clarity of Recommendations	Very Clear (4), Clear (10), Somewhat Clear (8), Confusing (2), Very Confusing (0), Very Clear (4), Clear (10), Somewhat Clear (8), Confusing (2), Very Confusing (0)
2. Coverage of Key Accessibility Areas	Coverage Score (1-10)	6.5
	Missing Accessibility Aspects	Not at all (5), Small extent (8), Somewhat missing (7), Predominantly missing (4), Significantly missing (0)
3. Practicality and Feasibility	Practicality Score (1-10)	7.1
	Balance Between Requirements and Practicality	Fully Agree (3), Agree (12), Neutral (5), Disagree (4), Fully Disagree (0)
4. Relevance to Various Roles	Relevance to Roles	Fully Agree (6), Agree (10), Neutral (4), Disagree (3), Fully Disagree (1)
5. Clarity on Priority Levels	Clarity of Priority Levels Score (1-10)	8.2
6. Consistency with Industry Standards	WCAG Introduction Score (1-10)	6.9
7. Practical Examples and Illustrations	Relevance of Examples Score (1-10)	7.5
	Sufficiency of Practical Examples	Fully Agree (4), Agree (12), Neutral (6), Disagree (2), Fully Disagree (0)

Figure 12. A table presenting the survey results for Siili Solutions Oyj

Moving forward, it would be beneficial to focus on expanding the guidelines to cover a broader range of disabilities and assistive technologies and to refine the balance between accessibility imperatives and practical application in design and development projects. This targeted enhancement could help ensure that the guidelines not only meet current accessibility standards but are also robust and flexible enough to adapt to evolving best practices and user needs.

The analysis of the survey data revealed the following key findings. Regarding the clarity of recommendations within the Accessibility Guidelines, we have received an average rating of approximately 8.2 out of 10. Specifically, 60% of respondents rated the clarity between 7 and 9, indicating a generally positive perception among participants, and only 10% rated the clarity below 7.

Moreover, the comprehensiveness of accessibility considerations within the guidelines received an average rating of approximately 8.3 out of 10. Similar to clarity ratings, 65% of respondents rated the comprehensiveness between 7 and 9. Again, only 10% rated the comprehensiveness below 7.

While the overall perception of the guidelines was positive, respondents suggested enhancements such as providing more practical examples and explicit instructions for specific sections. This feedback highlights the importance of continuously refining and updating the guidelines to ensure their relevance and effectiveness. The consistency reflects a holistic approach to web accessibility, encompassing clear communication of recommendations and comprehensive coverage of accessibility considerations.

Despite the overall positive perception, areas for improvement have been identified. Respondents suggested enhancements such as providing more practical examples and explicit instructions for specific sections. This feedback underscores the importance of continuously refining and updating the guidelines to ensure they remain relevant and effective in addressing evolving accessibility needs.

A summary of the survey results was delivered to the stakeholders for further accessibility guidelines modification to enhance the accessibility document. The review can assist in identifying specific areas for improvement, incorporating additional practical examples and explicit instructions into the policies based on the feedback received, and providing training or workshops for employees to guarantee they comprehend and can successfully execute the accessibility guidelines in their work.

8 Publishing and Optimizing Web Accessibility Guidelines

8.1 Publishing the Accessibility Guidelines

Web Accessibility Guidelines will be published on the company’s intranet. The intranet will serve as a platform for the protocol, as Siili Solutions Oyj's staff regularly utilizes it to obtain internal documents, reports, and tools. By integrating the accessibility guidelines into the intranet, the company can enhance visibility and encourage the immediate application of these practices in daily operations.

Additionally, to support ongoing learning and adaptation, a feedback system will be incorporated within the intranet where employees can quickly provide their insights or report issues concerning the accessibility guidelines. This feedback will be invaluable for continuous improvement, allowing the company to update and refine the guidelines when necessary. Regular updates demonstrate the company's commitment to fostering an inclusive digital environment.

To optimize the effectiveness of this approach, the guidelines will be presented in a user-friendly format that encourages engagement from all departments. Interactive elements such as quick links, downloadable templates, and instructional videos will also be included to facilitate understanding of the topic and integrate accessibility in projects. Moreover, sections of the guidelines can be tailored to different roles within the company, such as developers, designers, and content creators, providing specific advice and examples directly relevant to each job function. This customization will help ensure that the guidelines can benefit the organization.

8.2 Recommendations for Optimizing Web Accessibility Guidelines

To address the areas identified for improvement, it's essential to delve deeper into users' specific needs and challenges using Web Accessibility Guidelines. Real-world scenarios that demonstrate the implementation of accessibility principles in various contexts can provide concrete guidance and help users understand how to apply these principles effectively in their projects.

Additionally, addressing specific sections identified as confusing or lacking clarity is paramount. For example, complex data tables or implementing ARIA attributes may present challenges for users, particularly those with limited technical expertise. By providing detailed explanations, step-by-step instructions, and illustrative examples, these sections can be more accessible and easier to understand for all users.

In the elaborated versions of the guide, some potential beneficial topics for research include, among others, a section dedicated to mobile accessibility.

Thus, the researcher could investigate specific challenges and opportunities related to web accessibility on mobile devices. Exploring best practices for creating accessible mobile applications and websites can involve such factors as screen size, touch-based interactions, and mobile-specific accessibility features, such as navigation, buttons' size, form fields, etc.

Enriching the knowledge base regarding various limitations and disabilities can also yield benefits. For instance, conducting research and offering guidance on developing accessible services for individuals with cognitive challenges can aid the client in expanding their customer base, considering the prevalence of such conditions and impairments. Some examples of cognitive challenges are intellectual and learning disabilities, attention deficit hyperactivity disorder (ADHD), cognitive decline due to aging, etc. The guidelines regarding those impairments can comprise advice on providing clear and concise content, intuitive navigation, and supportive design elements.

9 Conclusion

Fostering a culture of accessibility and inclusivity within an organization goes beyond mere compliance with regulations — it embodies a commitment to social responsibility and equity. By prioritizing accessibility, companies demonstrate their dedication to developing environments that cater to the varied needs of all individuals. This commitment reflects ethical values and strengthens the organization's status as a socially responsible entity.

Siili Solutions has obtained an excellent reputation for developing inclusive solutions and has garnered strong partner endorsements. However, as accessibility requirements constantly evolve, it becomes imperative to maintain a high perception of accessibility among colleagues by providing guidelines, counseling on accessibility, and investing in accessibility experts. Doing so enables the company to remain at the forefront of accessibility initiatives and help its clients avoid legal issues.

Established Siili Solution Oyj's accessibility guidelines offer a comprehensive framework and set standards to which developers and designers can adhere while developing products and services. Moreover, compiled web accessibility guidelines are a company's image-making factor, reflecting its commitment to social responsibility. Thus, the company can attract favorable attention from customers, investors, and the public while reinforcing its values and ethics.

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Understanding Employees' Knowledge Gaps and Aspirations regarding Web Accessibility Protocol

1. Who did you involve in making accessibility decisions?
2. When did you start (and end) thinking about accessibility?
3. Did you design a product or create a product experience? Ensure the documentation, support, training, and marketing materials are accessible.
4. What challenges did you encounter, and how did you overcome them?
5. How did you communicate desired accessibility behavior to developers/ UX- UI designers?
6. How did you ensure that your accessibility research findings were coded into the final product?
7. What would you do differently next time?
8. What should be changed in the planning and preparation of projects' implementation?
9. Were there resources that would have been important but unavailable?
10. What would you wish to receive from the accessibility guide?

Interviews regarding Accessibility

▼ Interviewee 1

other notes:

- important to have a mobile-friendly responsive websites
- Project managers, designers, developers, content creators should have more knowledge about accessibility
- Good accessibility is a win-win for users and businesses
- webshops will be obliged to use regulations incorporating accessibility will become standard measure
- It is very important to use simple and semantically correct language
- Making sure headlines match the contents, being content aware
- Important that accessibility value is not solely based on plugin rating - information should make sense

1. **Who did you involve in making accessibility decisions?**

- only person who has accessibility background
- responsibility for accessibility audit
- designers and front-developers should disperse information about accessibility

2. **When did you do start (and end) thinking about accessibility?**

- accessibility should be started to be incorporated at UX design phase at the very beginning of the project
- all decisions are made with accessibility in mind
- To future-proof start thinking early enough, checking WCAG regulations on a routine manner; using such tools as SiteImprove (information should make sense)
- Make sure all automation elements are accessible
- Benchmarking can be useful sometimes, but it's better to have own design systems library with elements
- Plugins and tools that are used: SiteImprove, AXE, contrast plugin, making sure links can be easily distinguished

3. **Did you design a product or create a product experience?**

- pre-made design systems
- inform customer (guide) about what things can be made and what cannot (not to cause problems on the page), provide the a documented guidelines regarding usage of elements
- making sure everyone in the company is aware of accessibility
- no rich information about accessibility at the moment
- important hat people within the company will share data regarding accessibility (now mainly people in the UX engineering are most knowledgeable)

4. **1. What challenges did you encounter, and how did you overcome them?**

Division of responsibilities between design and developers

5. **How did you communicate desired accessibility behaviour to developers/ UX- UI designers?**

Designers and Developers get a grasp of each other fields. Would be good if there was accessibility oriented designer, more knowledgeable. Clear division of work. (Can designer ensure keyboard navigation?)

6. **How did you make sure that your accessibility research findings were coded into the final product?** (Keyboard and alternative input devices, magnification, switches, and screen readers just to name a few.)

Voiceover, NVDA, plugin for colour blindness, Adobe Acrobat PDF (accessibility tool). Siteimprove

7. **What would you do differently next time?**

Mistakes happen, need to learn from mistakes. It is important to remember about colorblind people. Checking accessibility frequently: easier to fix earlier than later. (good practice to print out pages to check)

8. **What should be changed in the planning and preparation of projects implementation?**

Mandatory accessibility training, to talk about subjct

9. **Were there resources that would have been important but were not available?**

It would be important that also sales people that should be aware about accessibility, certification

10. **What is your least favourite WCAG guideline?**

Transcription of audio and video (1. no good transcription services)

:

Labeling and Critical Answer Comparison

When did you do start (and end) thinking about accessibility?	- **beginning** of the project; - check on accessibility on a **regular** basis; - make all decisions with accessibility in mind -to future-proof **check WCAG on a routine manner** -benchmarking is useful, but better to have own **design system library** with elements	- **continuous project** - clean semantic design - doing right decisions from the **beginning**	- **beginning** of the project: understanding criteria for the project, technical details requirements - **test at every stage** of the project development - **regular discussions** about accessibility: changes to the project, bugs to fix: helps to evaluate budget	- **early** in the project, **continuous** learning program, not **thinking of accessibility** can bring a lot of problems; -hard to be to make future-proof decisions regarding accessibility: designers should be **proactive, monitor possible changes in guidelines** -good to	-keeping accessibility in mind when **reviewing designs with the designer:** immediately discuss is something is not accessible -I try to make accessible decision always - should be considered from the **beginning** - important other members of the team also having accessibility in	when ux process starts Continuous improvement: should be carried **throughout visual designs and content language, to markup semantics and UI interactions, to url schema and server reliability.** future-proofing: groundwork

Survey on Web Accessibility Guidelines

1. Analyzing the Clarity and Comprehensibility of the Accessibility Guidelines

1.1.Estimate on a scale of 1-10 how straightforward The Accessibility Guidelines are to understand and follow.

1.2.How clear are the recommendations provided in The Accessibility Guidelines?

a) Very Clear: The recommendations are concise, easy to understand, and provide clear, step-by-step guidance on achieving accessibility. They include specific examples, visuals, and practical tips, making them easy to implement.
b) Transparent: The recommendations are generally understandable and provide sufficient guidance for accessibility. However, more interpretation or additional research may be required to grasp the concepts or techniques fully.
c) Somewhat Clear: The recommendations are slightly understandable but could benefit from additional clarification or more detailed explanations. They may require some effort to comprehend or require seeking supplementary resources.
d) Confusing: The recommendations are unclear, convoluted, or lacking sufficient detail. They may use technical jargon without proper explanations or fail to provide clear steps or examples.
e) Very Confusing: The recommendations are difficult to understand or follow. They may contain technical terms or complex language inaccessible to individuals without specialized knowledge.

1.3.Are there any sections or chapters where instructions on the guidelines seem confusing or unclear? If there are, please mention it using the space below.

2. Coverage of Key Accessibility Areas

2.1.Estimate on a scale of 1-10 how comprehensively the guidelines cover important accessibility considerations.

2.2.Are there any significant accessibility aspects missing from the guidelines?

a) Not at all. The guidelines cover a comprehensive range of accessibility considerations and provide clear instructions on addressing them effectively.
b) To a small extent: The guidelines cover the most critical accessibility aspects, but there might be a few areas where further details or specific recommendations could be beneficial. These aspects may require additional guidance or interpretation.
c) Somewhat missing: The guidelines do not adequately address or explain some notable accessibility aspects. These aspects may require further clarification or specific guidance to ensure comprehensive accessibility coverage.
d) Predominantly missing: The guidelines lack clarity and detail in several important accessibility aspects. This may leave gaps or uncertainties in addressing specific accessibility challenges, potentially leading to confusion.
e) Significantly Missing: The guidelines cannot address crucial accessibility aspects. They may fail to provide clear instructions or overlook essential considerations, resulting in confusion.

2.3.Should the guidelines address a more comprehensive range of disabilities and assistive technologies?

a) Fully Agree: The guidelines should comprehensively address various disabilities and assistive technologies. They should provide specific recommendations and techniques to ensure accessibility for individuals with diverse disabilities.
b) Agree: The guidelines should cover a broader range of disabilities and assistive technologies to a reasonable extent. However, they may not be

able to address every disability or assistive technology individually.

c) Neutral: The guidelines may focus on a specific set of disabilities and commonly used assistive technologies without aiming to address every possible variation. This approach allows for more specific and practical recommendations.
d) Disagree: The guidelines should focus on a limited set of disabilities and widely used assistive technologies. Attempting to cover a broader range may result in diluted or less effective recommendations.
e) Fully Disagree: The guidelines should focus only on a narrow range of disabilities and the most commonly used assistive technologies. Expanding the scope to a wider range of disabilities and assistive technologies would make the guidelines too complex.

3. Practicality and Feasibility

3.1.On a scale of 1-10, estimate how practical and feasible the information provided in the guidelines for design and development projects is.

3.2.Do the guidelines strike a good balance between accessibility requirements and practical considerations?

a) Fully Agree: The guidelines are balanced, providing accessibility requirements and practical considerations. They offer comprehensive accessibility guidance while also considering implementation challenges.
b) Agree: The guidelines generally provide a good balance between accessibility requirements and practical considerations. They offer clear and actionable recommendations that address vital accessibility needs while paying attention to the practical aspects.
c) Neutral: Accessibility requirements and practical considerations are somewhat balanced. However, certain accessibility requirements may not be adequately addressed in some instances.
d) Disagree: The guidelines do not strike a full balance between accessibility requirements and practical considerations. They may

heavily prioritize accessibility without providing sufficient guidance on implementing the recommendations practically.

e) I'm afraid I have to disagree with the guidelines. They need to address practical considerations more adequately. They may excessively focus on accessibility requirements without adequately considering the practical limitations of design and development projects.

3.3.Are there any recommendations that are unclear or require additional explanation? (e.g. examples of cases, illustrations, links to the general sources)

4. Relevance to Various Design and Development Roles

4.1.Do the guidelines provide relevant guidance applicable to your role (e.g., designer, developer, content creator)?

a) I fully agree that the guidelines provide relevant and applicable guidance for the role. They offer clear recommendations, techniques, and examples that directly address individuals' responsibilities and challenges in their roles.
b) Agree: The guidelines generally provide relevant guidance for specific roles. While some areas could have been further developed or clarified, overall, they offer valuable insights and best practices.
c) Neutral: The guidelines are relevant to specific roles, but there may have been gaps or limited coverage of certain relevant aspects. Additional resources or supplemental guidelines might be required to fully address the needs.
d) Disagree: The guidelines lack relevant guidance applicable to specific roles. They are too generic or fail to address the requirements and considerations relevant to the role.
e) Fully Disagree: The guidelines are irrelevant or applicable to specific roles. They do not offer any meaningful guidance or support in addressing individuals' responsibilities and challenges in their roles.

4.2.Are there any areas where you felt the guidelines could have provided more specific guidance for your role? Do you agree with the statement?

a) I fully agree that the guidelines could have provided more specific guidance for my role. The recommendations should be more specific and more detailed instructions addressing particular challenges.
b) Agree: The guidelines could have offered more specific guidance for my role in certain areas. While they provide valuable insights and recommendations, there may have been instances where additional specificity would have been helpful.
c) Neutral: The guidelines are reasonably specific for my role, covering the most relevant aspects. However, additional specificity may have been beneficial in some areas.
d) Disagree: The guidelines provide sufficient specific guidance for my role. They offered clear and detailed instructions that directly addressed my challenges and responsibilities.
e) I'm afraid I have to disagree with the guidelines. They could be more specific for my role, providing excessive detail that may not have been relevant or applicable. The recommendations may have focused too narrowly on a particular context or technology.

5. Clarity on Priority Levels

5.1.Estimate on a scale of 1-10 how the guidelines indicate the priority levels of different accessibility requirements (e.g., A, AA, AAA).

5.2.Should there be more information regarding must-have and nice-to-have accessibility instructions based on the guidelines? Give an example.

6. Consistency with Industry Standards

6.1.Estimate on a scale of 1-10 how sufficient introduction to WCAG standards (Web Content Accessibility Guidelines) do the guidelines give?

6.2.Should there be more information regarding must-have and nice-to-have accessibility instructions based on the guidelines? Give an example.

7. Practical Examples and Illustrations

7.1.Estimate on a scale of 1-10 if the examples provided are relevant to real-world design and development scenarios.

7.2.Do the guidelines include enough practical examples or illustrations that helped you better understand how to apply the recommendations?

a) Fully Agree: The guidelines include practical examples or illustrations that effectively demonstrate how to apply the recommendations. These examples are clear and provide a comprehensive understanding of how to prioritize accessibility in projects.
b) Agree: The guidelines include practical examples or illustrations that help readers understand how to apply the recommendations. However, additional examples could have been beneficial in some areas.
c) Neutral: The guidelines have moderate practical examples or illustrations. While some examples were included, there may have been more illustrations or diverse examples would have been helpful.
d) Disagree: The guidelines need more practical examples or illustrations that would have facilitated a better understanding and application of the recommendations. The absence of concrete examples made it challenging to implement the guidelines effectively.
e) I'm afraid I have to disagree. The guidelines do not include any practical examples or illustrations. The absence of such visual aids hindered the understanding and application of the recommendations. The guidelines solely relied on textual descriptions.

8. Based on your experience and expertise, what are your suggestions for improving the accessibility guidelines?

9. Do you want additional information or clarification in the guidelines?

ACCESSIBILITY CHECKLIST: PROTOTYPING

You can check your prototype to meet WCAG 2.1 success criteria.

VISUAL

- [ ] 1. Use high-contrast colors and clear text to ensure readability
- [ ] 2. Provide alternatives to visual information, such as captions.
- [ ] 3. Use clear and recognizable icons.
- [ ] 4. Consider using larger font sizes and avoid small or light text.

COGNITIVE

- [ ] 1. Provide clear and concise language and avoid complex sentences and jargon.
- [ ] 2. Offer simple and straightforward navigation options.
- [ ] 3. Provide alternatives for critical information, such as captions or audio descriptions for videos.
- [ ] 4. Use clear and recognizable icons.

SPEECH

- [ ] 1. Use clear and concise language, avoiding technical jargon or slang.
- [ ] 2. Provide clear instructions and feedback to users.
- [ ] 3. Use clear and easily recognizable icons.

AUDITORY

- [ ] 1. Provide alternative forms of information, such as captions or audio descriptions for videos.
- [ ] 2. Use clear and concise language, avoiding complex sentences and jargon.

COGNITIVE

- [ ] 1. Ensure that all content is accessible through keyboard navigation, including forms and interactive elements.
- [ ] 2. Provide straightforward navigation options.

ACCESSIBILITY REQUIREMENTS

1. Accessibility laws and requirements (in Finland)

The Act on the Provision of Digital Services, which is based on the EU directive on the accessibility of websites and mobile applications in the public sector, imposes obligations on public sector and third-sector organizations to comply with accessibility requirements in their digital services.

Under this act, such services as e-commerce, e-books, transportation, and bank services, as well as services providing access to audiovisual content will have to consider following WCAG accessibility standard requirements. **The exception is done for micro-enterprises, which will be not obliged to follow WCAG standards starting from June 28, 2025.** To ensure compliance with accessibility standards, the Finnish Act on the Provision of Digital Services mandates the fulfillment of WCAG 2.1 (the latest set of guidelines) levels A and AA.

Disability Statistics in

Although not every disability hinders internet use, according to Statistics Finland, in 2021, approximately 1.4 million people in Finland, or around 25% of the population, were classified as having a disability. This includes people with physical, sensory, intellectual, and mental disabilities, as well as those with long-term illnesses. The statistics also indicates that disability prevalence increases with age, with around 48% of people aged 75 or over having some kind of disability.

Types of Disabilities

There are various examples of limitations that people are facing. Five general disability groups include **visual**, **physical**, **hearing**, **cognitive** and **learning** impairments. Disabilities can have different degrees, as for visual impairments - full or partial blindness, low vision or color blindness; for hearing impairments - full or partial deafness, etc.

Cognitive impairments can show up in difficulties remembering and learning new information and in severe cases in dementia, amnesia, delirium, etc. Changing health conditions due to aging, such as poor vision, hearing, motor and cognitive abilities are very common reasons causing people to use assistive technologies (magnifying glass tools, screen captions, etc).

Conclusion

Disabilities of some degree will most likely affect everyone's family member, relative and future self to a smaller or larger extent. Furthermore, there are also situational limitations that can affect websites or application users, such as bright sunlight, noisy surroundings, slow internet connection, and limited bandwidth. All those conditions have to be taken into consideration when creating web pages to ensure accessibility.

WEB CONTENT ACCESSIBILITY GUIDELINES

What is WCAG?

WCAG (Web Content Accessibility Guidelines) is an internationally recognized set of guidelines for making web content accessible to the widest possible auditory. WCAG guidelines are not specific to any particular region or country and they are widely adopted and followed by many countries around the world including members of the EU, US, Canada, and other countries. The regulations are constantly developed and updated by the Web Accessibility Initiative of the World Wide Web Consortium in collaboration with individuals and organizations around the world. Thus it is a **good practice to follow the updates regularly to notice changes when they occur.**

For whom it is intended?

Web Content Accessibility Guidelines (WCAG) concerns everyone, who is involved in creating or managing web content, such as web developers, web designers, content creators, web accessibility specialists, and business owners. All the specialists should identify accessibility barriers and provide solutions to make content accessible for everyone.

While some governments and healthcare organizations are required by law to comply with a minimum AA level of compliance, the standards of WCAG are not mandatory for virtual, private, or high street businesses at the present moment.

WCAG Principles and Guidelines

The current set of guidelines consists of 4 Principles, 12 Guidelines, 61 Testable Success Criteria, A, AA, AAA, which build upon one another. Level A covers the basic accessibility requirements that should be implemented to ensure a foundational level of accessibility. It addresses the most critical barriers that can prevent users with disabilities from accessing and using web content effectively.

Principles	Guidelines	Level A	Level AA	Level AAA
Perceivable	Text Alternatives	✓		
	Time-based Media	✓	✓	✓
	Adaptable	✓		
	Distinguishable	✓	✓	✓
Operable	Keyboard Accessible	✓		✓
	Enough Time	✓		✓
	Seizures	✓		✓
	Navigable	✓	✓	✓
Understandable	Readable	✓	✓	✓
	Predictable	✓	✓	✓
	Input	✓	✓	✓
Robust	Compatible	✓		

GOOGLE ANALYTICS

How can Google Analytics help?

If the customer happen to use Google Analytics, the following advices might help you. (Take into consideration that Google Analytics although being useful, is not GDPR compliant).

Google Analytics can be used to track user paths and identify areas where users may be experiencing difficulties. For example, website owners can use the "Behavior Flow" report in Google Analytics to visualize the most common paths that users take through their website. They can also use the "Site Search" report to see what keywords users are searching for on their website and whether or not the search results are providing relevant and useful information.

By analyzing user paths, website owners can identify areas where users may be experiencing difficulty, such as pages that have high bounce rates or a high percentage of exits. They can then use this information to make improvements to the website, such as optimizing page layouts, improving navigation, and making sure that content is accessible to all users, including those with disabilities.

How to identify user paths with Google Analytics:

You can create custom reports and segments that focus specifically on users with disabilities. These insights can be used to improve website accessibility and ensure that all users are able to access and use the website effectively.

1. Set up Google Analytics on your website: If you haven't already, you will need to set up Google Analytics on your website and add the tracking code to all pages.
2. Create custom segments: In Google Analytics, you can create custom segments to filter data by specific user characteristics. To create a segment for users with disabilities, you can use the "Accessibility" dimension, which includes options for visual, auditory, motor, and cognitive disabilities.
3. Analyze user behavior: Once you have created your custom segment, you can use Google Analytics reports to analyze user behavior. For example, you can look at the pages visited by users with disabilities, the time spent on each page, and any exit pages.
4. Identify issues: By analyzing user behavior, you may be able to identify issues that prevent users with disabilities from accessing and using your website effectively. For example, you may find that users with visual disabilities are spending more time on certain pages or exiting the website more frequently than other users. This could indicate that there are issues with the website's accessibility.

How to identify commonly used devices with Google Analytics?

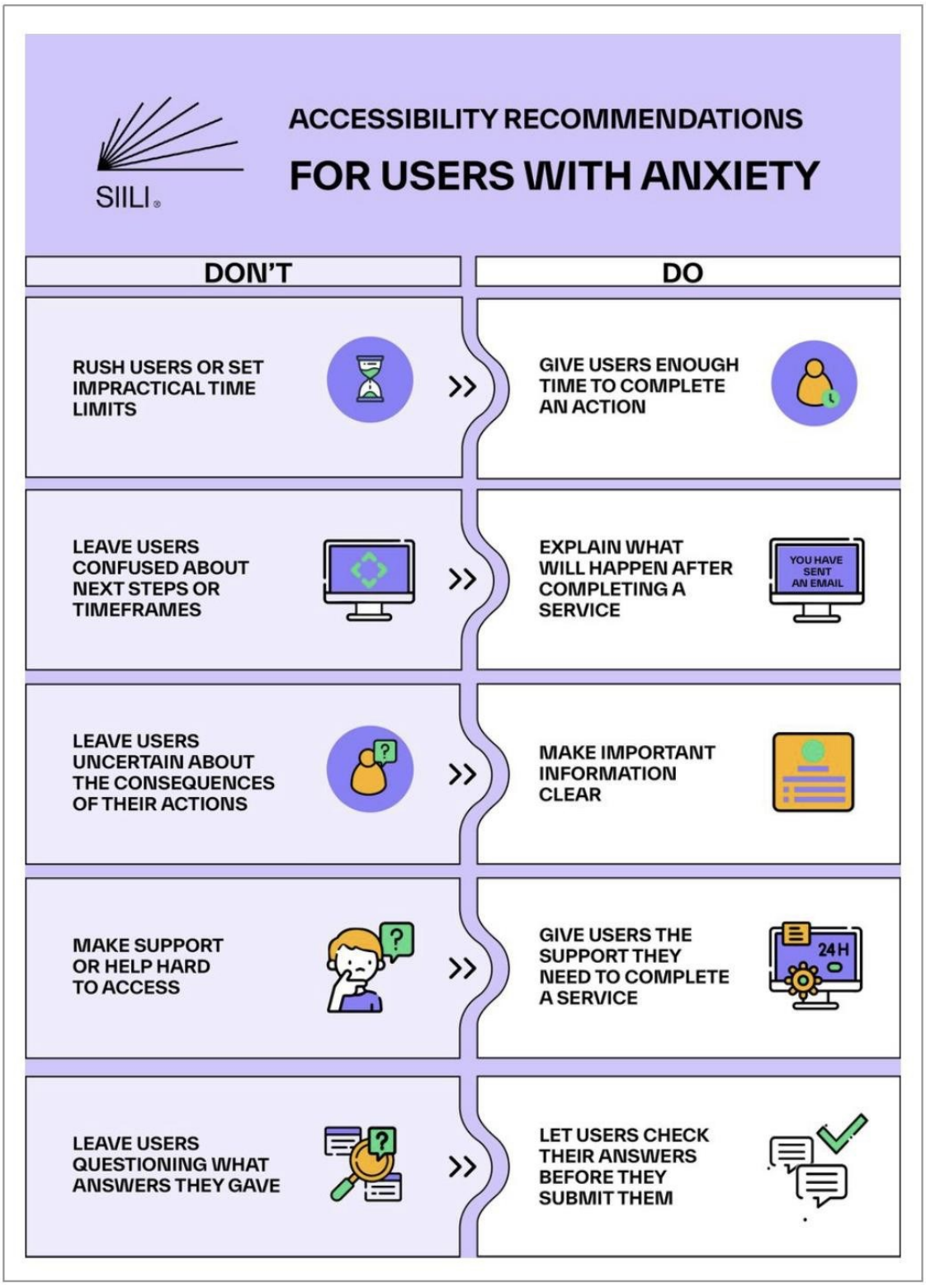
go to the Audience section in Google Analytics and click on the Technology tab. From there, select the Browser & OS report. This report shows the operating systems and browsers used by your visitors.

You can also use the Device Category report to see the types of devices used, such as desktop, mobile, or tablet. This information can be useful for optimizing your website for different screen sizes and device types.

By identifying commonly used devices, you can ensure that your website is accessible and usable on those devices. For example, if a large percentage of your users are using mobile devices, you should make sure that your website is responsive and optimized for smaller screens.

Hot Keys

Interaction	Keystrokes	Notes
Navigate to interactive elements	• Tab - navigate forward • Shift + Tab - navigate backward	• Keyboard focus indicators must be present • Navigation order should be logical and intuitive
Link	• Enter - activate the link	
Button	• Enter / Spacebar - activate the button	Ensure elements with ARIA role="button" can be activated with both key commands
Checkbox	• Spacebar - check/uncheck a checkbox	Users can typical select zero, one, or multiple options from group of checkboxes.
Radio buttons	• Spacebar - select the focused option (if not selected) • ↑ / ↓ or ← / → - navigate between options • Tab - leave the group of radio buttons	Users can select only one option from a group of radio buttons.
Select (dropdown menu)	• ↑ / ↓ - navigate between options • Spacebar - expand • Enter/Esc - select option and collapse	You can also filter or jump to options in the menu as you type letters.


SIILI
ACCESSIBILITY RECOMMENDATIONS
FOR USERS WITH ANXIETY
DON'T
DO
RUSH USERS OR SET IMPRACTICAL TIME LIMITS
GIVE USERS ENOUGH TIME TO COMPLETE AN ACTION
LEAVE USERS CONFUSED ABOUT NEXT STEPS OR TIMEFRAMES
EXPLAIN WHAT WILL HAPPEN AFTER COMPLETING A SERVICE
YOU HAVE SENT AN EMAIL
LEAVE USERS UNCERTAIN ABOUT THE CONSEQUENCES OF THEIR ACTIONS
MAKE IMPORTANT INFORMATION CLEAR
MAKE SUPPORT OR HELP HARD TO ACCESS
GIVE USERS THE SUPPORT THEY NEED TO COMPLETE A SERVICE
24 H
LEAVE USERS QUESTIONING WHAT ANSWERS THEY GAVE
LET USERS CHECK THEIR ANSWERS BEFORE THEY SUBMIT THEM