Rethink: Conceptualization of a tablet interface aimed at raising awareness of digital accessibility

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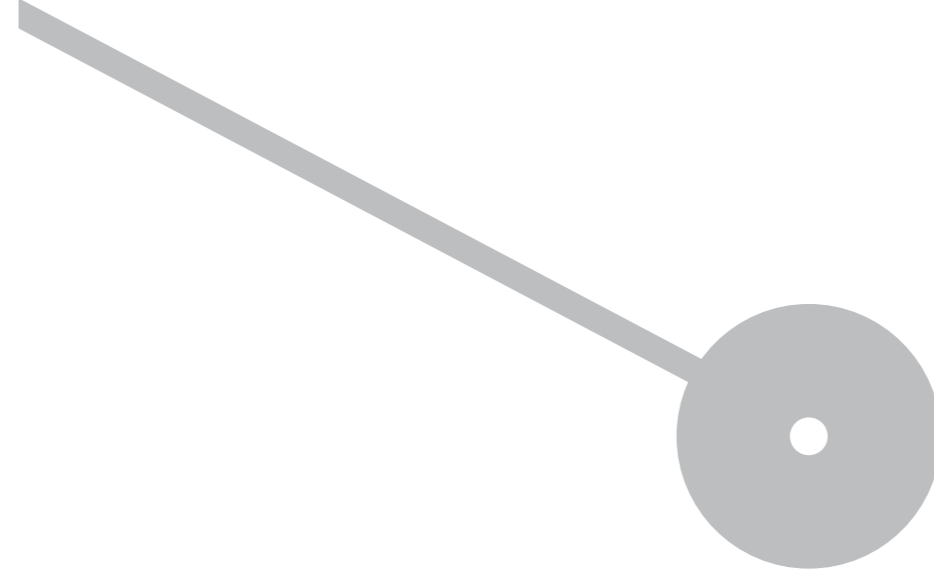
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Politécnico do Porto

Escola Superior de Media Artes e Design

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Trabalho de Projeto

Mestrado em Sistemas e Media Interativos

Orientação: Prof. Doutor Rui Rodrigues

Vila do Conde, setembro de 2023

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RESUMO

A acessibilidade digital tornou-se um aspecto crucial da tecnologia moderna, promovendo a inclusão de indivíduos com diversas habilidades. No entanto, muitos designers e programadores carecem de um conhecimento abrangente sobre acessibilidade, o que dificulta a criação de experiências digitais universais.

Esta dissertação tem o intuito de apresentar uma interface interativa que utiliza o *storytelling* para aumentar a consciencialização e capacitar designers e programadores na área do design acessível. Inclui uma revisão literária sobre os desafios da acessibilidade, seguida de uma abordagem baseada em estórias que aproximam os utilizadores das dificuldades de pessoas portadores de deficiência.

Por meio de testes de usabilidade, foi confirmada a eficácia da interface em preencher a lacuna de conhecimento e fomentar uma cultura de acessibilidade e inclusão digital. Esta pesquisa contribui para a criação de um cenário digital mais acessível para todos os utilizadores.

Palavras-chave: Acessibilidade; Design de Interfaces; Design Centrado no Utilizador; Storytelling; Aplicação Móvel.

ABSTRACT

Digital accessibility has become a crucial aspect of modern technology, promoting inclusivity for individuals with diverse abilities. However, many designers and developers lack comprehensive knowledge of accessibility, which hinders the creation of universal digital experiences.

This document presents an interface that utilizes storytelling to increase awareness and empower designers and developers in the field of accessible design. It includes a literature review on the challenges of accessibility, followed by a storytelling-based approach that immerses users in the experiences of individuals with disabilities.

Through Usability Testing, the effectiveness of the interface has been confirmed in bridging the knowledge gap and fostering a culture of accessibility and digital inclusion. This research contributes to the creation of a more accessible digital landscape for all users.

Keywords: Accessibility; Interface Design; User Centered Design; Storytelling; Mobile Application.

SUMMARY

IMAGE LIST

TABLE LIST

SYMBOLS AND ABBREVIATIONS

ADA   Americans with Disabilities Act

DDA   Disability Discrimination Act

HCI   Human Computer Interaction

IA   Information Architecture

IxD   Interaction Design

RTT   Real Time Text

TTY   Teletypewriter

UI   User Interface Design

UX   User eXperience Design

UCD User Centered Design

UX   User eXperience Design

WAI   Web Accessibility Initiative

WCAG Web Content Accessibility Guidelines

W3C   World Wide Web Consortium

1 INTRODUCTION

1.1 Context

Websites are like buildings in the digital world; if they have barriers, such as a lack of accessibility, people with disabilities may be denied access to critical information and programs. According to the World Health Organization (WHO), approximately 15% of the world's population has some form of disability (WHO, 2011). Despite this, the majority of websites and web applications are not designed with accessibility in mind. This is a problem because it prevents many people from using these tools and gaining access to information on the internet.

In this context, web accessibility refers to the process of creating websites and applications that are usable by a wide range of users, regardless of disability. Web accessibility includes many disability categories that affect access to web-based platforms, including: i) auditory; ii) cognitive; iii) neurological; iv) physical; v) speech; vi) visual (Shadi Abou, 2017).

The significance of web accessibility has grown exponentially, as access to online information has become a fundamental and universal right. Assistive technologies have created innovative methods to view the web, enabling individuals with disabilities to access critical programs or information. For example, those who are blind can use screen readers, transforming visible text into audio information they can hear. Similarly, those with hearing loss can benefit from captioning, allowing them a visual avenue of understanding content spoken in videos or podcasts. Special voice recognition software is employed by people whose disabilities impede their ability to control computers using traditional means like mice, trackpads, and keyboards - commanding these devices verbally for an accessible experience.

The lack of widespread adoption of web accessibility can be attributed, in many cases, to the need for greater awareness and understanding of the issue. Some designers may not be familiar with practices to make their websites more accessible or may consider the implementation to be a time-consuming and costly process. But neither of these things has to be true. With a bit of knowledge and effort, anyone can design an accessible website or application.

The "Rethink" Application is designed to address accessibility in an approachable way; emphasising web accessibility with the help of a story. "Rethink" will walk

designers and non-designers alike through an easy-to-follow story format that raises accessibility principles to the forefront of the design and User eXperience (UX) process. Within the "Rethink" application, anyone creating digital interfaces can benefit from it to apply what they learned there into other digital interfaces. The "Rethink" application will also promote a greater awareness of accessibility and help anyone creating on the web easily comply with their accessibility goals. Also, this application will be used for tablet initially, mainly because of the screen size it offers and it being a portable device.

1.2 Main & Specific Objectives

The purpose of this research is to give a comprehensive overview of the issues related to accessible digital design and ensure that the application's concept is validated. Additionally, the research will cover and apply all design principles during the development process. The following are specific objectives for how the results of this research should be:

Raise awareness about Digital Accessibility, this is the main objective I want to achieve with this project;

Achieve an AA or if possible, AAA quality standard, this is the level of accessibility I want to achieve while making the design;

Create a user-friendly and easy to use interface, without colours and/or components that distract.

Develop an Accessible Application, with this I want to make it usable for everyone.

1.3 The Motivation

Flaws in accessible design persist, and a creative solution is needed to address this issue effectively. Accessibility is a multifaceted concern with room for improvement.
The primary motivations for this work stem from a genuine interest in and concern for the issue, which dates to my time in high school when I was pursuing a career in architecture. During that period, I received education on integrating accessibility features into buildings. Furthermore, I have a keen desire to expand my knowledge in areas such as UI/UX Design and Visual Design. The impact of accessibility on individuals has always intrigued me. Developing an application or software that caters to everyone

is a noteworthy challenge, and successfully doing so will reshape perceptions of digital accessibility. Participating in this transformative process has inspired me to create an application aimed at raising awareness about digital accessibility and the comprehensive processes involved.

1.4 Methodology

The initial phase of this document is predicated on analysis derived from various sources, including articles and books that pertain to digital accessibility, Web Content Accessibility Guidelines (WCAG) Guidelines, and Storytelling. The information presented in this phase serves to define the problem under consideration. In addition, the design fields germane to this project are addressed, highlighting a set of fundamental concepts.

The second phase of this document addresses the application design development methodology, the applied techniques, their detailed description, and the results obtained. These techniques include user research, which was conducted to validate the project's ideal. In the same phase, the product was made available in its first version, which was then subjected to a usability testing that is also presented in detail.

1.5 Structure of the Document

This document is structured into five chapters. The first chapter, entitled "INTRODUCTION," provides an overview of the project's context, motivations, and their objectives. Additionally, the document methodology is outlined, along with an explanation of its structure.

Chapter two, "LITERATURE REVIEW," explores the problem of the lack of digital accessibility and related questions, followed by studies on Storytelling for Digital Interfaces, which are considered important and applied in the project.

Chapter three, "METHODOLOGY," encompasses design research, methods and techniques applied, and the definition of the applied story.

Chapter four, "PROTOTYPE DESIGN," incorporates the Design System, and the different stages of application design, including the final version of the prototype, along with a description of usability testing, analysis, and results.

The final chapter, "CONCLUSION," contains future work, process limitations faced, and final considerations.

2 LITERATURE REVIEW

2.1 The existing problem - The lack of accessibility in digital interfaces

The Internet has transformed how we live our lives: we work, socialize, and recreate in ways that would have been unimaginable even fifteen years ago. These changes have generated exciting opportunities, but those opportunities have not been equitably distributed. There are well-established disparities or "digital divides" in the level of access to digital resources that different groups experience (Cullen, 2003; Fairlie, 2014; Norris, 2001; Robbin, 2004).

Ability is one of the key vectors along which a digital divide has taken shape (Dobransky & Hargittai, 2006; World Web Consortium, 2023). Having a disability, whether cognitive, physical, or sensory, affects a person's ability to participate in our digital universe. However, this digital divide is often overlooked (Popek, 2022). The goal of this project is to foster awareness of digital accessibility.

Toward that end, it will address the following questions: what is digital accessibility? Why is digital accessibility a problem, and what are its implications in key areas such as finances, education and social? How did digital inaccessibility come to be a common state of affairs? Our discussion during this topic will make clear that digital inaccessibility is an avoidable and unjust condition that can, however, be improved through thoughtful measures.

What is Digital Accessibility?

To commence, let us clarify the concept of digital accessibility. In this context, "Accessibility" pertains to the extent to which a given entity, such as an object, environment, or service, can be utilized by individuals with disabilities (Kulkarni, 2018). The term "Digital Accessibility" specifically refers to the extent to which computer hardware or software can be utilized by individuals with disabilities (Kulkarni, 2018). More specifically, "web accessibility" is a subset of digital accessibility that indicates the degree to which people with disabilities can access the Internet in particular (Kulkarni,

2018). Thus, the concept of digital accessibility alerts us to the way that a person's body or cognitive type can prevent them from fully accessing digital resources.

It's worth pausing to ask what we mean by "disability"? The most common definition in the scholarly literature and amongst disability activists stems from work done in the 1970s and 1980s on the "social model" of disability (Lesnik-Oberstein, 2015; Mladenov, 2014; Oliver, 2018). The social model of disability emphasizes how bodily differences interact with social conditions, including digital conditions (Easton, 2013), to enable or impair a person's ability to interact with their setting (Goodey, 2016).

How many people have a disability?

By some estimates, upwards of one billion people globally have some type of disability (Shakespeare, 2017); around 87 million people in the EU have a disability (European Commission, 2023), and approximately 40 million noninstitutionalized people have a disability in the United States (United States Census Bureau, 2021).

Is Digital Accessibility a Problem?

The lack of accessibility to digital interfaces has significant social implications for individuals and society. From an individual level, those with any form of impairment that makes the use of digital technologies more difficult or even inaccessible find themselves at a disadvantage. This results in reduced opportunities for training, education, employment, communication, leisure activities, and exercising their rights as citizens. On a broader scale, the exclusion from certain aspects of life damages entire communities deprived of their rightful access to information and technologies due to their disability status.

Thus, "digital accessibility" refers to the degree to which people with disabilities can use computer software/hardware. Is digital accessibility a problem? To what degree do people with disabilities have trouble accessing digital resources?

Many people with disabilities profoundly struggle with digital accessibility. The research on this is astounding. As far as I know, not a single scholarly study has found that digital accessibility is not a problem, though an extensive body of literature confirms that it is a problem (Rowland, 2023; Solovieva & Bock, 2014). More concretely, some studies have found that nearly 90% of web pages currently pose an accessibility issue

(Ringlaben et al., 2014). By some estimates, only 3% of the Internet is fully accessible to people with disabilities (Moradi, 2022).

Staggering as they are, those statistics are just the tip of the iceberg: for example, upwards of 60% of people in the EU with disabilities live in households that lack Internet access, and people with disabilities are much less likely to have access to Internet-connected devices in the first place (Dobransky & Hargittai, 2006; Petrosyan, 2022). In one Pew Research Center study, 23% of respondents with disabilities reported that they "never" go online (Perrin & Atske, 2021).

The accessibility issues behind these trends can take many forms. Common challenges include a lack of closed captioning or incomplete or inaccurate captions (Shakespeare, 2017). The need to use computer hardware such as a mouse to access website content, which many people with physical disabilities find challenging if not impossible (Torres, 2023), exorbitant prices for essential devices such as those that convert website text into braille (Moradi, 2022), underdevelopment in or lack of widespread access to promising technology such as eye pointers or foot pedals (United States Department of Education, 2023), and many other challenges.

A full accounting of the implication of digital accessibility is beyond the scope of this project, but it is worth nothing some implications of such for key domains:

Financial - The lack People with disabilities have long evidenced deficits in employment and income in comparison to their non-disabled peers: by some estimates, people with disabilities see an average annual decrease in income of $10,000 per year by virtue of having a disability; the average unemployment rate for people with disabilities is 75% (Domingo, 2012; Shakespeare, 2017). Many commentators have argued that the digital revolution has made people with disability's professional lives more difficult (Ross & Taylor, 2017), and this is likely to intensify as our work lives become even more reliant on digital technologies and more likely to reward digital skills.

Social - The social lives increasingly happen online. Currently, 60% of the world's population uses social media, and the number of global users is expected to increase to almost 6 billion by 2027 (Chaffey, 2023). People with disabilities

report having difficulty with the accessibility of social media apps (Anderson et al., 2023; Asuncion et al., 2012). The current trajectory of digital accessibility is likely to sustain if not worsen this dynamic, which will then further compound the social isolation many people with disabilities already report experiencing– both online specifically and in social life more generally (Pulrang, 2022; Scholz et al., 2017; Zeng & Parmanto, 2004).

Educational - Online education has become more popular than ever: from 2012 to 2019, the number of hybrid and distance-learning students at traditional universities increased by 36%, with COVID-19 having increased that rate of growth by upwards of 92% after 2020 (Diaz-Infante et al., 2020). The ability to learn online is exciting, but online learning poses unique challenges that can be further compounded by broader issues of digital accessibility (Carly & Bronsema, 2020; Massengale & Vasquez, 2016). While schools have come a long way in their approaches to digital accessibility, much work remains to be done: academic settings have long had conflicted relationships with disability, which is unlikely to be reversed in just a few short years (Timothy Dolmage, 2017).

How did Digital Accessibility become Common?

Evidently, digital accessibility poses a significant challenge. It is noteworthy to consider the development of our digital landscape, which frequently excludes substantial portions of the population. The evolution of digital inaccessibility, as it stands today, prompts questions regarding its origins and how it has become a prevailing norm.

In a sense, there has never been a time when digital accessibility wasn't a problem. For nearly as long as there has been widespread Internet usage, commentators and disability activists have raised grave concerns regarding digital accessibility (Bakardjieva, 2005; Bargh & McKenna, 2004; Hackett et al., 2005); indeed, even in the 1990s, studies found that upwards of 80-90% of websites posed accessibility issues (notably, roughly the same proportion as now according to some estimates) (Adam & Kreps, 2009; Pilling et al., 2004; Rowland, 2023).

This outcome is unsurprising for anyone familiar with the history of accessibility. For as long as we've had data on the topic, people with disabilities have demonstrated

considerable gaps in relation to their non-disabled counterparts according to virtually every conceivable metric (educational, economic, social, etc.) (Shakespeare, 2017). From that perspective, the issues we are seeing in digital accessibility now ultimately do little more than mirror and replicate larger patterns of inequality among people with disabilities that are, unfortunately, not new or uncommon. While the disability rights movement has made important progress, much work remains ahead of us, and addressing digital accessibility is only one dimension of what will need to be done to reverse long-standing equity issues regarding physical, sensory, and cognitive diversity (Rose, 2015; Shakespeare, 2017).

2.1.1 People and their disabilites

An understanding of the different types of disabilities is essential when aiming to make online platforms accessible, in order to create a compelling application that raises awareness about disabilities and showcases both good and bad practices, it was crucial for this research to thoroughly understand the various types of disabilities and the barriers they face. Therefore, the necessary step of gaining a more profound knowledge of every kind of disability was taken. Different impairments and needs can be addressed and understood better through the diverse perspectives of people with varied disabilities by listening to them, understanding their needs, and taking the appropriate steps for inclusive development. It is also important that each individual disability is treated with respect and dignity to ensure comfortability and acceptance for all users–finding ways for everyone to be included ensures that no one feels left out or ignored.

Studies have shown that adhering to web accessibility guidelines creates a better experience for all users, not only those with impairment. Therefore, it is crucial that people take into consideration all types of disabilities when creating accessibility guidelines (Schmutz et al., 2017).

> **Visual** - Visual impairments remain a significant challenge in the design of online platforms. In order to maintain an accessible experience for all users, measures must be taken to ensure that visual impediments are overcome. This can include using contrasting colours, adjusting font sizes, providing captioning

for videos and images, and including audio versions of text content where possible. Additionally, alt-text should be included for all non-text content, such as images and icons, to allow those relying on screen readers or other assistive technology to interpret the assets on the platform. By taking such measures, online platforms will promote a more inclusive digital environment enjoyable for everyone (Shadi Abou, 2017).

Cognitive, Learning, and Neurological - Cognitive and learning impairments include, but are not limited to: developmental issues such as autism, epilepsy, attention disorders and hyperactivity, psychiatric diseases, etc.; acquired issues such as traumatic brain injury, stroke, tumor, etc.; as well as neuropsychological disorders that can appear when aging. For instance, low contrast levels on websites can be a barrier for these users as some suffer from dyslexia or visual processing difficulties. Additionally, websites should consider providing alternate forms of navigational elements that may be beneficial for those whose cognitive abilities hinder their task completion. Furthermore, different language support or embedded text-to-speech options might be implemented, further assisting in website navigation. These steps will go a long way in allowing users increased accessibility and the opportunity to confidently navigate websites that cater to their needs (Cinquin et al., 2019).

Speech - Speech disabilities can occur for a variety of reasons, including developmental disabilities, neurological conditions, and physical impairments. For people with speech disabilities, communication can be a significant challenge, particularly when it comes to using digital devices and services. However, advancements in speech recognition and speech-to-text technology have made it possible for people with speech disabilities to communicate more effectively using digital technologies (Shadi Abou, 2017).

Auditory - Auditory disabilities are diverse, ranging from mild or moderate hearing loss in one or both ears, commonly known as "hard of hearing," to severe and irreparable hearing loss in both ears, referred to as "deafness." Individuals

with auditory disabilities may have the ability to perceive sounds; however, they may not be able to comprehend all speech, particularly when surrounded by background noise. This category may encompass individuals who rely on hearing aids(Shadi Abou, 2017).

Physical - Physical impairments are those that limit a person's ability to interact with the physical world. This could be from an injury, such as a spinal cord injury or amputation, or from a birth defect, like cerebral palsy. For people living with physical impairments, web accessibility is essential for their day-to-day activities. From being able to use digital devices independently to accessing online resources and finding employment opportunities – having access to the internet is critical for individuals with physical disabilities in order to participate fully in society.

2.1.2 Current situation in Europe and Portugal

Considering that the project will involve usability testing conducted by Portuguese designers and developers in the English language, which is their official working language, it has been deemed prudent to incorporate an analysis of the current state of digital accessibility in Portugal. This approach acknowledges that variations exist among European countries in terms of digital accessibility practices.

Europe

Around 135 million Europeans live with a disability, a number that is likely to increase as populations age. Many individuals rely on computers, smartphones, and other digital devices in the modern world. Without digital accessibility guidelines, many users find obstacles that prohibit them from completing routine tasks that most of the public takes for granted. The transition to a more digital environment offers numerous new prospects that can significantly impact our daily lives. Nevertheless, not all individuals have access to the internet world. In 2021, 8% of EU residents aged 16 to 74 did not use the internet at all (Tunberg, 2022). Globally, the digital divide is considerably greater. In 2021, over a third of the world's population, or 2.9 billion individuals, did not use the internet.

In Sweden, for example, although the country had one of the highest internet usage rates in the EU in 2021, online usage varies greatly between user groups. In 2021, only 6% of Swedish adults over the age of 16 did not utilize the internet. This number increased to 20% among those with disabilities of all ages and 33% for those older than 76 (Tunberg, 2022). Some research indicates that digital health tools are utilized more frequently in urban areas than by ethnic minorities and those with language barriers (WHO, 2022). Those with a greater degree of education and a higher socioeconomic class used digital health tools more frequently, according to the study. Also, younger individuals were shown to utilize digital technologies more than older people. Today, there are 2,905,200 people with vision, hearing, or movement impairments in Portugal. 18% of the population suffers from chronic physical or cognitive impairments that impact digital accessibility (Portuguese Observatory of Web Accessibility, n.d.). In addition, 508,400 individuals over the age of 65 have difficulties seeing, even with prescription lenses.

The European Accessibility Act (EAA) was initially proposed in 2011 as a supplement to the European Accessibility Directive, which was adopted in 2016. According to this law, which has been in place since 2019, member states have until June 28, 2022, to adopt accessibility measures. The act stipulates that apps and websites must be designed with four accessibility principles in mind, including perceivable, operable, understandable, and robust (Fry, 2021). The European Accessibility Directive was established by the European Commission in 2016, mandating that all national, regional, local, and semi-public authorities make their websites and mobile applications accessible. Accessibility features consist of the following:

An adjustable font size
Operability of website for people with mobility impairments
Alternative text for those with visual impairments

According to the European Accessibility Directive, member states must report their progress. Yet, a thorough examination of 26 European countries in 2022 reveals that almost no country has fully compliant websites or applications (Brakel, 2022). In fact, 84% do not meet the requirements of the European Accessibility Regulation. The big problem with compliance is the lack of an overview. The majority of EU member states

lack a single registry or another overview that details the accessibility of their websites and apps. Without such a mechanism, it is difficult for the monitoring agency to evaluate the accessibility of a country. Moreover, this makes enforcement impossible.

Portugal

In 2021, Portuguese Prime Minister António Costa declared that the government would establish a national policy for the inclusion of individuals with disabilities, which includes initiatives to promote employment and enhance accessibility. This is monumental as Portugal has consistently lagged behind other European countries in a national disability strategy or action plan meaning that disability policies continue to be piecemeal and lack a strategic orientation (Campos Pinto et al., 2021). Nonetheless, Portugal has been prioritizing digitizing websites and increasing digital skills in community members. These changes lead to an ever growing "digital economy" and thus they deeply impact the world of work as a whole. With opportunities also come challenges like the imperative to leave no one behind in the digitalization process, including the more than one billion persons with disabilities across the globe. The first step of their action plan has included digital education, professional training and reskilling, and digital inclusion and literacy (Portugal Digital, 2020).

Even if all available website pages were adapted to accessibility guidelines and best practices in Portugal, individuals with disabilities are still restricted in their internet access from home which greatly impacts educational and occupational opportunities. Today, about 88.2% of all households in Portugal have access to the internet, which represents a slow but continuous increase from previous years (Statista, 2023). Despite an increase in internet availability, digital accessibility for people with impairments remains severely limited in this country. For example, the highest levels of access, and the narrowest disability gaps, were in Sweden, Denmark, and the Netherland, with the lowest levels of access, and relatively wide gaps, in Greece, Portugal and Romania. Countries with generally high levels of Internet access at home do not always demonstrate high levels among disabled people (e.g., in Finland). The chance of having internet access at home in Portugal remains about 62% lower for people who reported a disability that restricts physical mobility than for those who did not (Scholz et al., 2017).

While literacy in digital skills remains a further challenge in accessibility, accessibility itself remains an area poorly developed in Portugal creating a large barrier that many persons with disabilities face further compounding their marginalization and social exclusion (Campos Pinto et al., 2021).

2.1.3 Digital Accessibility Guidelines and WCAG

The Web Accessibility Initiative (WAI) was developed to create and implement digital accessibility guidelines, technical specifications, and educational resources to help make the internet accessible to individuals with disabilities. The Web Content Accessibility Guidelines (WCAG), including WCAG 2.0, WCAG 2.1, and WCAG 2.2, are international standards that provide an overview of how to make internet content more accessible and aim to provide a standard for web content that enhances accessibility. Such content includes text, images, sounds, and code that defines structure. WCAG was intended to guide the actions of web content developers, web authorizing tool developers, web accessibility evaluation tool developers, and others who want or need a standard for web accessibility, including mobile applications (Lawton Henry, 2005). The WCAG guidelines are categorized by four overarching principles, including perceivable, operable, understandable, and robust. Furthermore, success criteria conforming to the guidelines consist of three levels: A, AA, and AAA (Accessible Metrics, 2019).

Perceivable Guidelines

It is important to provide text alternatives for non-text content so that it can be transformed into different formats, such as large print, braille, speech, symbols, or more straightforward language (Deshpande, 2023), depending on the user's needs. Descriptive information should accompany controls, inputs, time-based media, tests, and exercises. CAPTCHA should have different sensory options to cater to varying disabilities. Content meant only for the decoration should be set up in a manner that assistive technology can ignore.

Text-based alternatives for time-based media make information more accessible. Text can be rendered in different sensory modalities, such as visual, auditory, or tactile, and can also be translated into symbols, sign language, or simpler forms.

Content should be created in a way that can be presented differently without losing information or structure (Deshpande, 2023).

Information and relationships implied by visual or auditory formatting should be preserved even when the presentation format changes, such as when a screen reader reads the content or when a user style sheet is substituted for the author's style sheet. Alternative content presentations should maintain the order of displayed content. Additional information should be provided to explain anything dependent on shapes or positions that may not be perceivable by some users with disabilities due to the nature of their assistive Technologies (Kirkpatrick et al., 2018).

Color should not be the only way to communicate information visually, and audio content that plays automatically for more than three seconds should have a mechanism that allows users to pause, stop, and control the volume independently from the device's audio controls. Text and images should have a minimum contrast of 4:5:1 and an enhanced contrast of at least 7:1, except for large text, decorative text, logos, and brand names. The text should be resizable up to 200% without compromising function or content and should be used to describe images (Kirkpatrick et al., 2018).

Background audio should not have background noise and should be adjustable by the user. It should be 20 decibels lower than the foreground audio components if background audio is essential. For the visual presentation of text blocks, users should be able to adjust the foreground/background colors, which should be 80 characters or glyphs wide at most, aligned to the left or right side, have at least 1.5 line spacing, and can be resized up to 200% without assistive technology (Kirkpatrick et al., 2018).

Operable Guidelines

User interface (UI) components and navigation should be operable through a keyboard interface without specified timing between keystrokes but should not prohibit mouse or other input forms. Users should be allowed enough time to read and use the content. Timing should be adjustable. Users should be able to turn off the time limit, adjust it, and extend it with a simple action unless the content is part of a real-time event, an extension of time would invalidate the activity, or the time limit is longer than 20 hours (Kirkpatrick et al., 2018). If any content moves, blinks, or scrolls automatically for more than five seconds and is presented with other content, users should be able to

pause, hide, or stop it from occurring. If an interruption in content occurs, users should be able to postpone it unless it relates to an emergency. If the user needs to re-authenticate a session, they should not lose their data following re-authenticating (Kirkpatrick et al., 2018).

Web content should not be designed in a way that is known to contribute to seizures from occurring. For instance, flashing should not occur more than three times in one second. Mechanisms should be available to bypass content that is repeated on multiple pages. Titles, headings, and labels should describe the overall topic or purpose of the page or label. The purpose of links should be provided in the link text alone. Additionally, information on the user's location within a set of pages should be available (Kirkpatrick et al., 2018).

Understandable Guidelines

The default language of a page, passage, or content should be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vocabulary of the immediately surrounding text. If there are any unusual words, they must be accompanied by definitions. Abbreviations or acronyms should be accompanied by the expanded term. If the pronunciation of a word is vital for its relayed meaning, a mechanism for pronunciation must be available (Kirkpatrick et al., 2018).

Web content should appear and operate in a predictable manner. For example, user interface components should not change the content context, navigation should be consistent through all pages, the functionality should be uniform, and the user should initiate deviations. If an input error occurs, it should be described to the user. Labels and instructions are necessary if the content requires input from the user (Kirkpatrick et al., 2018).

Robust Guidelines

If markup languages are used, they should have complete start and end tags. Elements should be nested according to their specifications and not contain duplicate attributes. The name and role can be programmatically determined. The user should set states, properties, and values. If any changes become available, the user should be

notified. Note that this criterion is primarily for web authors who develop or script their own user interface components. For example, standard HTML controls already meet this criterion when used according to specification (Kirkpatrick et al., 2018).

WCAG 2.1 and 2.2

The WCAG 2.1 and recently introduced WCAG 2.2 provide guidelines and success criteria for enhancing the website and digital application accessibility. WCAG 2.1 builds upon its predecessor, WCAG 2.0, by introducing new success criteria and enhancing existing guidelines. It concentrates on eliminating accessibility barriers faced by persons with disabilities and aligns with technological advancements. WCAG 2.1 greatly emphasizes mobile accessibility, recognizing the growing dependence on mobile devices for accessing digital content. It addresses the unique challenges inherent to mobile interfaces, such as touch targets, screen orientation, and device compatibility. Furthermore, WCAG 2.1 introduces guidelines to enhance cognitive accessibility, reflecting users' diverse cognitive abilities and needs. This emphasis on clear instructions, simplified content, and robust navigation offers considerable benefits to users with cognitive disabilities (Germano & Silveira, 2022).

WCAG 2.2 expands upon the accessibility standards outlined in WCAG 2.1 by incorporating additional success criteria that address both emerging technologies and user requirements. This ensures that digital experiences remain inclusive as technology continues to evolve. WCAG 2.2 provides guidelines for developers to create accessible experiences in new domains, including augmented reality (AR) and voice interfaces. By covering these novel technologies, WCAG 2.2 empowers developers to create inclusive digital experiences that meet the needs of a diverse range of users (e-shot, 2023).

Compliance with the WCAG 2.1 and 2.2 is imperative for organizations seeking to meet accessibility standards and legal requirements. Adhering to these guidelines can help reduce legal risks, bolster brand reputation, and facilitate a more inclusive organizational culture. As such, it is highly recommended that businesses and academic institutions prioritize the implementation of these guidelines in their digital content and design.

2.2 Storytelling and Digital Interfaces

Since prehistory, storytelling has been an important aspect of the human experience. The power of storytelling has been investigated by psychologists, anthropologists, and sociologists equally, with many discovering that it plays an important part in the formation and maintenance of civilizations.

For many academics, such as Robin Mello at the University of Wisconsin in the US, storytelling helps create a sense of shared history and identity among members of a society, which can help foster understanding and peace between people from different cultural backgrounds (Mello, 2001).

Storytelling is also a major factor in how we perceive ourselves and others around us. A report by anthropologist Paul Stoller of West Chester University suggests that through stories, we are able to "construct our own reality" (Stoller, 2018), allowing us to make sense of the world around us. Furthermore, this process helps shape our outlook on life and enables us to better understand our own experiences as well as those of others – something which is incredibly important for creating bonds between individuals.

The ability to tell stories has been linked to the growth of human intelligence over time. This was explored by many anthropologists over the years who tested the hypothesis that early hominids developed cognitive skills partly as a result of their use of storytelling (Baxter, 2014).

The findings revealed that when humans began exchanging stories with one another, they were able to develop increasingly complex language systems, allowing them to communicate more effectively and think more critically about their surroundings, and, perhaps most importantly, stories were agents of genuine connection and relation with one another.

It is important to note that storytelling is not confined to verbal or written forms; it may also take visual forms such as paintings or pictures; metaphorical forms such as poetry; musical forms such as songs; or even physical ones such as dance performances. In recent years, storytelling through digital platforms has increasingly become its own tale, sparking a critical discussion about incorporating stories into digital design (Jenkins, 2022).

A digital platform serves as a vital link between people, services, and technologies. Digital platforms are a great way to expand your audience, offer diverse media options, and connect with the right people in the community. Storytelling can help you share your stories and gain knowledge and information in an accessible way. Digital storytelling has advanced significantly, fueled by humanity's need for connection through narratives. It has a more extensive reach, allowing users to feel closer to the characters and even become part of the story's journey. The platform also encourages interaction, which can influence decision-making and foster connections between past and present. It's a powerful tool for engaging in pedagogical discourse and exploring personal experiences of students and teachers (Kogut, 2022).

Stories connect people to causes and foster brand loyalty. Digital storytelling has become an increasingly popular tool to engage audiences and stay relevant with modern media outlets (Spurgeon et al., 2009). For example, one needn't look much further than applications like Instagram, YouTube, TikTok, to harness the power of user-generated stories through a combination of video and interactive elements.

While early digital storytelling studies relied mostly on a combination of digital media, the recent decade has witnessed significant growth in the usage of sophisticated technologies such as Augmented Reality (AR), wearable, tactile, and mobile devices. Stories, in conjunction with this new immersive technology, are altering the way we perceive stories.

By utilizing storytelling through a digital platform, we can leverage the power of technology to create highly engaging narratives that make content accessible to a wider range of audiences. Moreover, storytelling on a digital platform allows for greater creativity and collaboration between writers, artists, and animators, which enables the production of more diverse and dynamic stories. Additionally, by using storytelling on digital platforms, one can reach out to various audiences in multiple and immersive formats, thus enhancing the audience's experience.

2.3 Similar Applications

2.3.1 Apple Accessibility

The website showcased how the iPhone, iPad, and associated PCs may help people with sensory, motor, hearing, and cognitive disabilities. There are several

accessibility settings that may be enabled at the same time during iPhone, iPad, and related PC setup. Many iOS devices include accessibility features that may make it easier for those who are deaf, hard of hearing, or have unique hearing needs to use their devices. The way the website is presented with the assistance of fully applied images and mini-interactions makes it more appealing to use and navigate (Apple, 2023). Some of the features present on the website are listed below:

> Music, movies, phone calls, and podcasts may all be improved for Apple users using Apple- or Beats-supported headphones by tuning the volume to the user's preference and enhancing the headphones' acoustic performance. The website highlighted some "hearing" features, including sound recognition, RTT and TTY, mono audio, balance, phone noise cancellation, LED flash for alerts, headphones audio, background sounds, subtitles and captions, transcriptions for intercom messages from HomePod, live captions, etc;
>
> Some features of the "Vision" category are VoiceOver, Zoom, Display, Text Size, Motion, Spoken Content, Audio Descriptions, etc;
>
> "Physical and motor" accessibility features include AssistiveTouch, Touch accommodations, Reachability, Face ID and attention, Switch Control, Voice Control, Side or Home Button, Pointer Control, Apple Watch Mirroring, Apple TV remote, Keyboards, AirPods, etc;
>
> The iPhone accessibility panel also includes some general features such as Guided Access, Siri, Accessibility Shortcut, and Per-app settings.
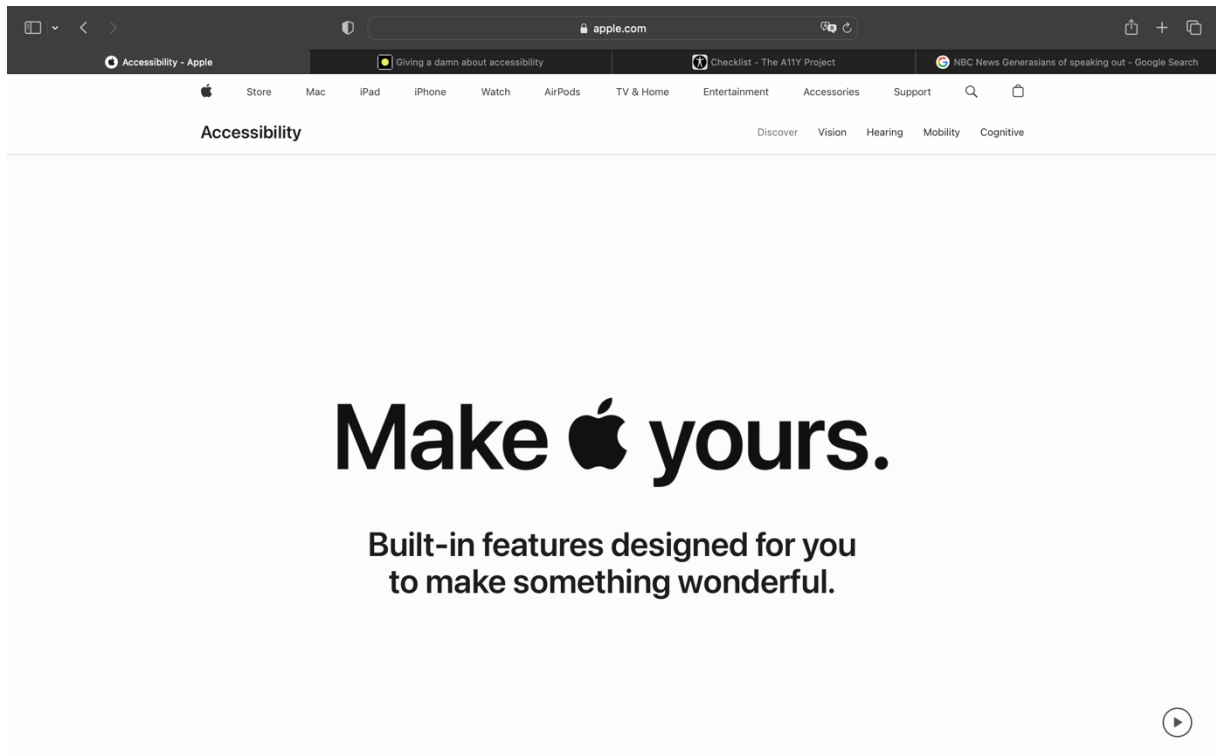
Image 1 - Apple Accessibility Website Screenshot

2.3.2 Giving a damn about Accessibility

Digital accessibility ensures that all users of digital platforms have equal access to information, functionality, and experience. People with physical, mental, or social disabilities, such as socioeconomic or neurodiversity discrimination, are included. Sheri Byrne-Haber is a leading disability and accessibility expert in business and education. She has helped millions of disabled people. Sheri believes that comprehensive accessibility programs give disabled people the best chance of equality in a business environment designed for the abled. "*My appeals always opened with "why this is important" and then went on to the specifics of the case from there. When you convince people why something is important, they are personally vested in the solution when the important thing is not being provided, or is substandard, or broken*" (Byrne-Haber, 2021).
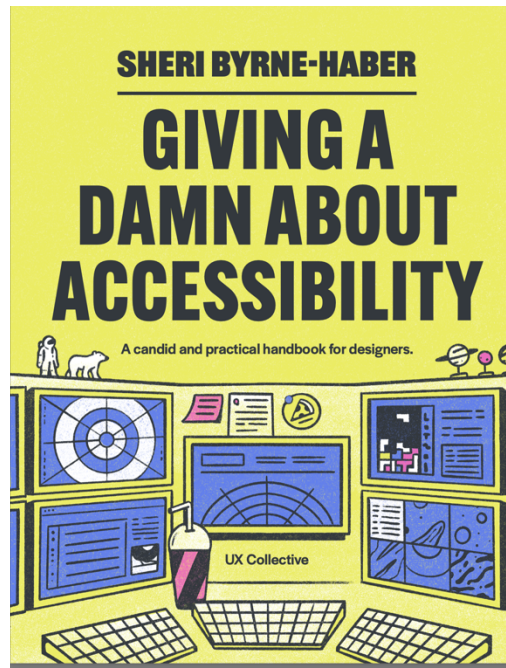
Image 2 - Giving a damn about Accessibility Screenshot

2.3.3 The A11Y Project Checklist

This checklist targets many, but not all, level A and level AA concerns for websites and web apps (*Checklist - The A11Y Project*, 2022). This checklist has a corresponding WCAG "success criterion" for each item. The most relevant success criterion is identified for each checklist item. However, there is no such thing as "perfect accessibility" or a site that is "100% accessible." If you need professional accessibility help, use professional accessibility services. Some of the instructions can be seen on the checklist tab of the website[1]:
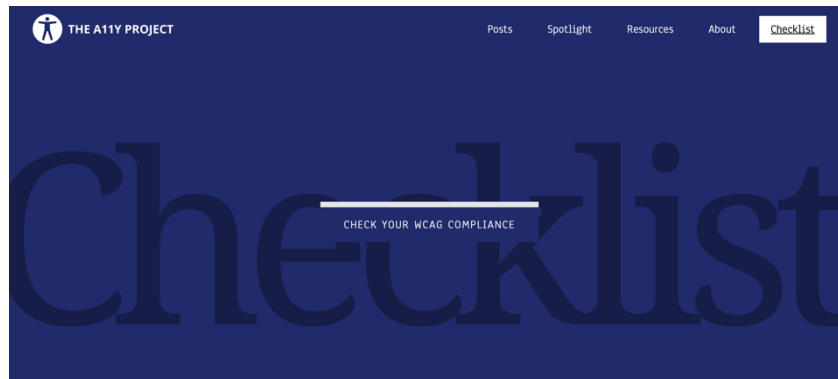
---

[1] https://www.a11yproject.com/checklist/

Image 3 - The A11Y Project Checklist Screenshot

2.3.4 NBC News GenerAsians of invisibility

Asian Americans and Pacific Islanders of all generations share their experiences of racism and discrimination and how they have persevered in facing these challenges. The subject of Asian prejudice has been told in such a different way in this example of digital storytelling (Abdelkader et al., 2021). It allows the audience to relate to and identify with these people's tales. Some stories are mentioned below:

*"**Sydney Ling. Palo Alto, California. Age 14** - In 7th grade, my teacher told the class that Asian Americans no longer face racism or discrimination today. This statement shocked me. I started a magazine by Asian American youth.*

***Anna Johnson. Des Moines, Iowa. Age 26** - Being AAPI from the Midwest, I experienced a range of discrimination and racism on campus. I co-directed a cultural dance show, Fusion, to bring light to the issues.*

***Brenda Khor. Doraville, Georgia. Age 26** - I faced racism when I helped make a powerful statement through art in Atlanta. Now, I'm marching alongside my AAPI family and allies, participating in discussions & sharing my story on all platforms.*

***Samantha Suarez. Grand Rapids, Michigan. Age 29** - When I mentioned that I had moved from Manila, Philippines, a guy asked if I was here to get married. I politely explained that I was a dual citizen."*

Image 4 - NBC News GenerAsians of invisibility Screenshot

3 METHODOLOGY

3.1 User Centered Design (UCD) & Research Techniques

The methodology used in the design and development of the application was the User-Centered Design (UCD) approach. The UCD approach is a design process that focuses on the needs, preferences, and behaviours of the end-users. In this Project, the methodology involved the following stages: user research, concept development, prototyping, and user testing (Image 5).

The first stage of the UCD approach is user research. The aim of this stage is to gain a deep understanding of the users, their needs, and the context in which the mobile application will be used. The research findings were analyzed to identify the key user requirements and preferences. Based on the insights gained from the user research, the next stage was the development of concepts for the mobile application.

During the next phase of the User-Centered Design (UCD) process, the focus moved to Information Architecture (IA) and Prototyping. This critical stage involved creating a high-fidelity prototype that included detailed design elements and advanced features. Information Architecture was used to make sure that the application's content and features were easy to navigate and user-friendly.

User testing was a crucial stage in the UCD approach. The aim of this stage was to observe and analyze how users interacted with the mobile application prototype. The user testing involved usability testing which was used to evaluate the ease of use and efficiency of the application, all this information gathered was used to make design refinements on the final prototype. The methods and techniques in these 4 phases can be visualized in the following image (Image 5). The different techniques will be described in the next chapter.
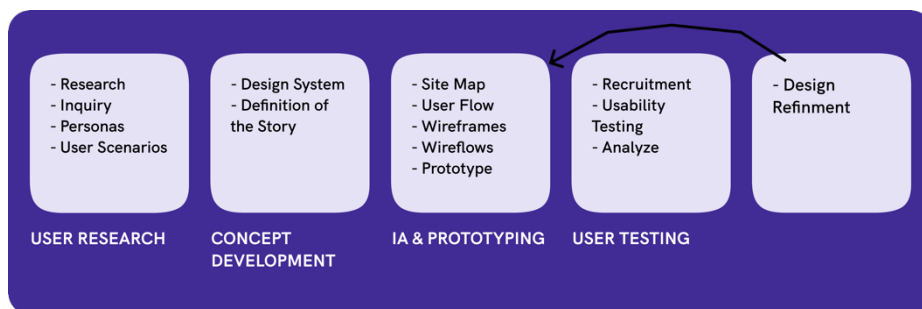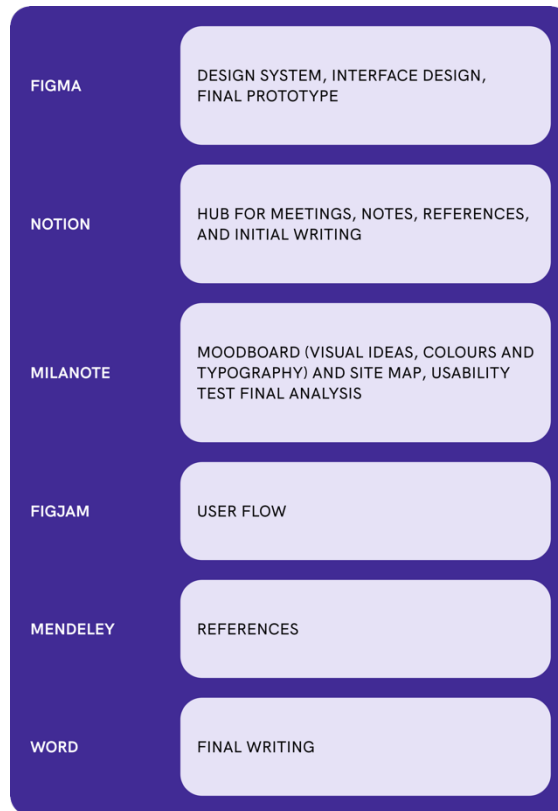

Image 5 - Visual Methodology

3.2 Softwares & Project Schedule

For the realization of this Project, there were a set of software's used along the process. The name of the software's and their functions are as follow:

Image 6 - Softwares

For a good organization a Project Schedule was done to help to stay consistent and do the tasks, it was divided into 5 steps: Research and Analysis, Design System and Illustrations, Design and Prototyping, Usability Testing and Finalization and Documentation. The Schedule can be seen on the next page (Image 7).
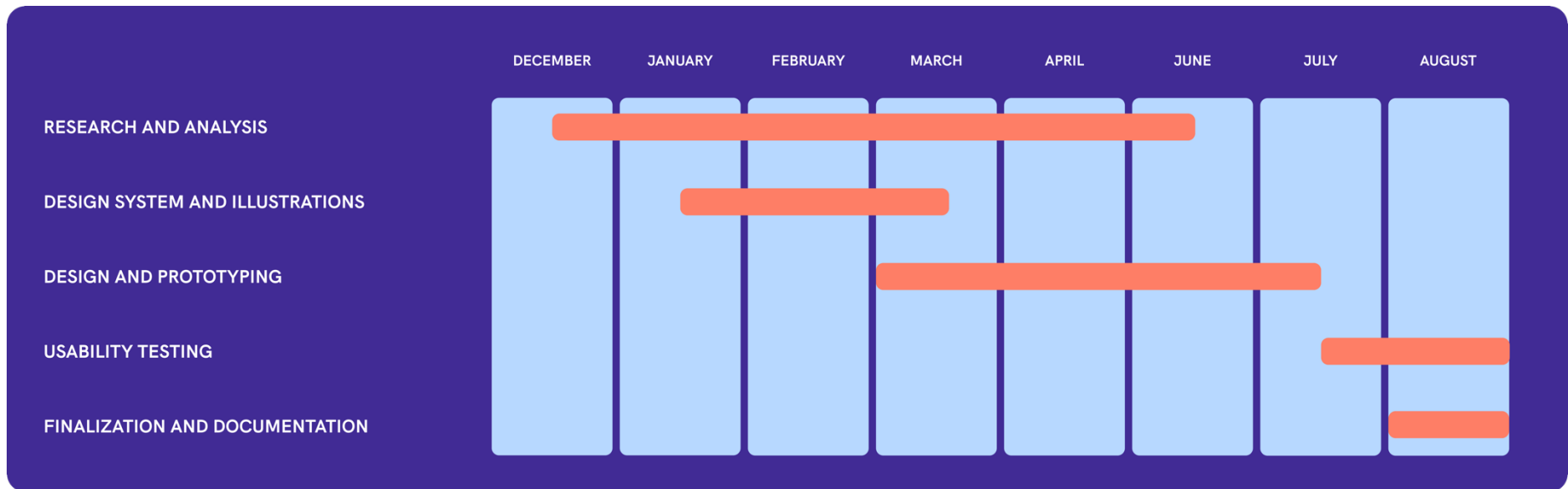
Image 7 - Project Schedule

4 PROTOTYPE DESIGN

4.1 User Research

Many techniques have been identified that might be used in projects like this. The techniques to be utilized are chosen based on the project's objectives and development, analyzing which ones are most suited to the process and will yield the most valuable outcomes. Every method should be tailored to the situation. Usability testing and User flows are examples of techniques. The first tool utilized for this study was an introductory questionnaire designed to assess people's awareness of digital accessibility. With this questionnaire, the personas could be created. To represent the user, personas and user scenarios are constructed. A set of tools was needed to complete the practical part of the research which will be shown later on. Before designing the application, a site map was created based on previous research results, and then the user flow using it as the final technique.

4.1.1 Digital Accessibility Questionnaire

To gain a deeper understanding of individuals' perceptions and knowledge regarding digital accessibility, an initial general questionnaire has been devised. The questionnaire will serve as a foundation for the development of personas that may ultimately utilize the application. Its purpose is to gather valuable insights and perspectives that will inform the creation of a user-friendly and inclusive digital experience. Upon analyzing the results of the Questionnaire which totaled an amount of 6 people, it was determined that the age range of participants fell between 18-34, with a diverse range of professions including Designers and Developers. The study revealed a balance between those who exhibited a strong understanding of digital accessibility and those who possessed basic to limited knowledge on the subject matter. These findings will serve as valuable feedback for the development of personas, which are included in the next topic in this document. The questionnaire and the answers are available at Attachment 1.

4.1.2 Personas

After conducting a thorough research process which involved a literature review and a questionnaire, three distinct personas were created. These personas were carefully crafted to accurately depict the characteristics and behaviors of specific target groups (image 8).
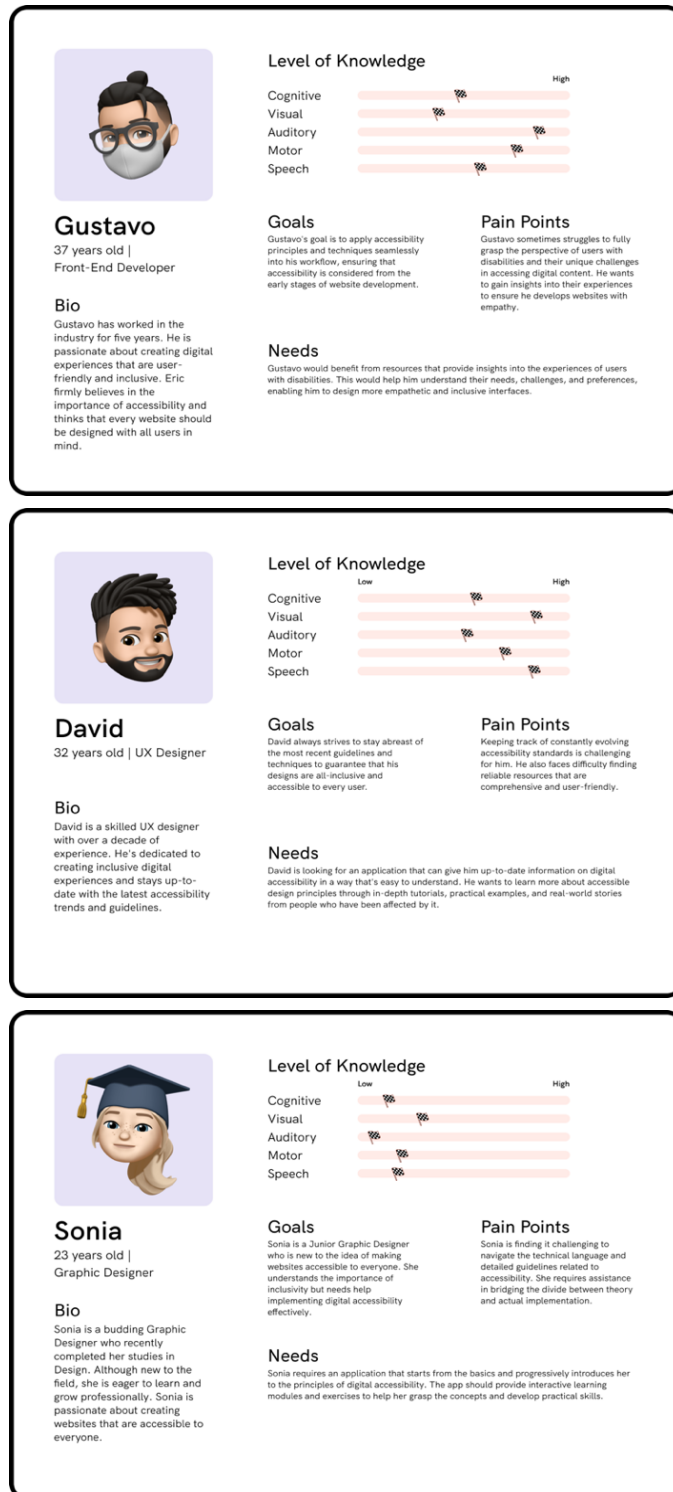

Image 8 - Personas

4.1.3 User Scenario

In this user scenario, we delve into the professional journey of Sofia, a freelance designer committed to creating inclusive and user-friendly digital experiences. Sofia's encounter with the Rethink application demonstrates its invaluable role in supporting her pursuit of digital accessibility in design.

Sofia uses the digital accessibility application to assist her in this project. Here is a user scenario that demonstrates how the application can support her:

1. Sofia accesses the Rethink app by logging in;
2. After logging in, she receives a personalized onboarding experience that allows her to select a character. Following that, she receives a message explaining what to expect;
3. Upon visiting the home page, Sofia is greeted with a warm welcome message and provided with chapters specifically dedicated to disabilities. A set of tools that can be helpful in the creation of digital interfaces and interviews made to people having trouble using digital interfaces telling their daily life can also be found on the same page, everything in WCAG 2.1 standards, organized in an easy-to-understand format.
4. Sofia is interested in improving her knowledge about visual disabilities and designing better solutions for people with such disabilities. She navigates to the chapter on visual disabilities, where she finds clear and concise guidelines about the dos and don'ts of designing for visually impaired individuals;
5. By navigating to the settings page, the user can view their level of understanding regarding digital accessibility as a whole;
6. Sofia feels prepared to begin designing after reading and incorporates accessibility measures such as color contrast and an accessibility checklist, as well as any other helpful references she can find on the app;
7. As Sofia completes the digital interface, she feels confident that she has implemented a range of accessible design practices, thanks to the support of Rethink;

8. Sofia showcases the interface to her client, emphasizing the enhancements she has made for accessibility. The client is impressed by Sofia's dedication to inclusivity and the smooth integration of accessible design elements;

9. Sofia is actively using the Rethink app for upcoming projects. She is keeping herself updated on the latest accessibility guidelines, sharing her experiences with the community, and improving her skills as an empathetic designer.

This user scenario illustrates how Rethink supports Sofia throughout her design process, providing her with dos and don'ts, guidelines, tools, examples, and a supportive community. By leveraging the application's resources, Sofia successfully incorporates accessibility into her designs, creating a more inclusive digital experience for all users.

4.2 Concept Development & Visual Identity

4.2.1 Definition of the Story and Narrative Structure

The story begins with the selection of the main character, which has little bearing on the story later on. Let's call this character Accessi. While still young, Accessi believes that everyone is like him/her, that they see, hear, process, talk, and touch in the same manner. Unfortunately, this is not the case, because some people have trouble using something because, for example, they process information differently than others.

When he/she visits his/her grandfather, Mr. Bility, he/she expresses that he/she dislikes it when others have difficulty using products and want to make it easy for them. That's when Mr. Bility remembers how he used to aid those individuals when he was younger. He walks to his room without saying anything and returns with a very old book. He then informs Accessi that he kept a diary of everything he learnt while aiding those folks throughout the years. He then asks Accessi if she wants to hear his story, and of course he/she accepts, and this is the beginning of the story that the user will witness.

The narrative will be divided into chapters, every chapter will be focusing one specific topic. There will be a total of 6 chapters and one Introduction. The chapters will talk about the 5 types of disabilities (Visual, Cognitive, Speech, Physical and Auditory) finalizing with a conclusion. At the beginning of each chapter will be a brief story/introduction regarding the disability and at the end will be an interaction between

the characters from the story to add a personal touch to it. In between will be information on the dos and don'ts (Contentsquare, n.d.; Pun, 2016). The conclusion will be the end and the start of all what was learned with a brief part of the story also including the end of the story and the beginning of a new story.

4.2.2 Design System

An initial Design System was developed to assist in organizing UI elements such as the layout, typography, colors, iconography, logo, cards, buttons, and illustrations. Elements such as buttons and cards will be shown in their default, pressed, and checked state. The significance of a Design System can differ based on the project. In this case, four reasons made it opportune to create one:

Consistency - A Design System helps to maintain a consistent visual and interaction design language across different platforms, devices, and screen sizes. This ensures that all components, such as colors, typography, icons, and spacing, are used consistently throughout the application. This consistency promotes a cohesive user experience, making navigating and understanding the interface more accessible (Fessenden, 2021).

Efficiency - A Design System makes the design and development process faster by providing pre-designed components, patterns, and guidelines. Designers and developers can use existing components instead of creating everything from scratch for each new feature or screen. This saves time and ensures consistent design and development standards, resulting in a more efficient workflow (Fessenden, 2021).

Scalability - Keeping things consistent can be challenging as applications grow and change. To address this, a Design System provides a centralized resource that can grow as the application evolves. By implementing a Design System, updates become effortless and changes to design or interactions are applied consistently throughout the application, minimizing inconsistencies and errors (Fessenden, 2021).

Collaboration - Design Systems enhance collaboration among designers, developers, and other stakeholders by providing a common language and reference point for discussions and decision-making. This fosters better communication and alignment within the team, allowing designers to focus on solving higher-level problems. Additionally, developers can quickly implement and maintain standardized components rather than constantly reinventing (Fessenden, 2021).

It is crucial for this project to have a Design System?

Inclusivity - Ensuring digital accessibility means making sure that people with disabilities can use digital products and services. By making accessibility a part of the design process from the start, you create an inclusive and welcoming experience for a broader range of users, including those with visual, hearing, motor, and cognitive impairments.

Improved User Experience - It is important to remember that accessibility features can benefit all users, not just those with disabilities. For instance, providing alternative text for images can help visually impaired users. However, it can also be helpful in situations where images cannot be loaded due to slow internet connections or technical problems. By prioritizing accessibility, you can improve the overall user experience and ensure that your application is more reliable and user-friendly for everyone.

Accessibility Guidelines - A Design System focusing on digital accessibility can be a valuable resource for designers and developers to learn about best practices. It offers guidelines, principles, and examples for creating accessible interfaces, covering topics like color contrast, typography, keyboard navigation, and screen reader compatibility. By using this system, designers and developers can gain a better understanding of the techniques and considerations needed to create designs that are accessible to all users.

Continuous Updates and Education - As technology advances and new standards emerge, accessibility guidelines and best practices also evolve. To keep designers and developers updated with the latest accessibility standards, techniques, and regulations, a Design System can be implemented within an application focusing on digital accessibility. This system can provide regular updates, educational resources, and notifications about any changes or advancements in the field.

To further support the development of interface design, the design system defines the main elements and the appearance of buttons, cards, colours and typography. A selection of these elements is presented below for reference (image 9).
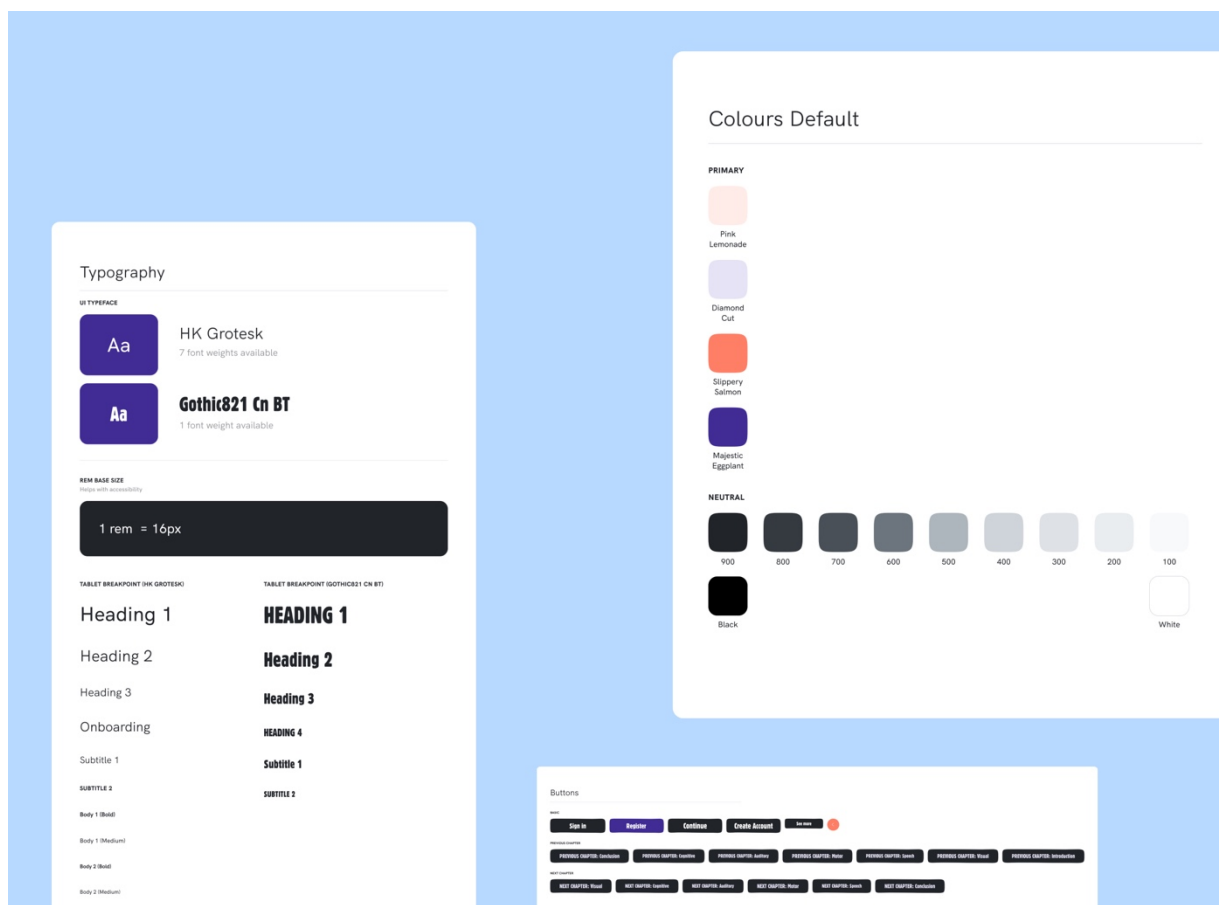
Image 9 - Design System Pages

4.2.2.1 Logo

The creation of this logo (Image 10) aimed to achieve simplicity and minimalism in design, facilitating comprehension and effective communication of Rethink's core concept. Additionally, to infuse a sense of relatability, the logo intentionally avoids straight lines, imparting an "imperfect" quality to the letters, symbolizing the individuals whom we seek to assist through this application.

Image 10 - Logo

4.2.2.2 Accessible Colour Palette

Accessible colour palettes are colour combinations that meet the standards for web accessibility, ensuring that users with visual impairments or colour blindness can easily perceive the content on the page. Accessible colour palettes typically use high contrast colours and avoid using colour combinations that are difficult for people with certain types of colour vision deficiencies to distinguish. The WCAG recommends a contrast ratio of at least 4.5:1 for normal text and 3:1 for large text (18pt or larger).

Given that the visual disability is a primary factor for the development of the interface, the ratio of 4.5:1 or more is what I wanted to achieve, with the help of a contrast checker tool[2]. The final colour palette can be seen as follow (Image 11).

| Majestic Eggplant | Slippery Salmon | Pink Lemonade | Diamond Cut |

Image 11 - Colour Pallete

---

[2] https://abc.useallfive.com/?colors[]=FFEBE7,E6E2F6,FE7E66,412B95,FFFFFF,000000

4.2.2.3 Accessible Typography

Accessible typography refers to the use of typography that meets the standards for web accessibility, ensuring that users with visual impairments or learning disabilities can easily read and understand the content on the page. Accessible typography typically uses clear and legible fonts, appropriate font sizes, and appropriate line spacing and character spacing. Which I wanted to achieve by selecting a font that has all those features, because of those factors the font HK Grotesk was chosen. Project fonts can be seen as follow (Image 12).
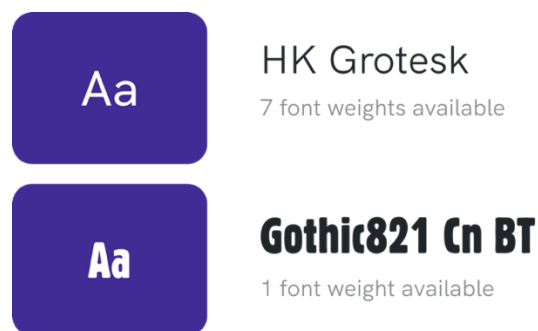
Image 12 - Typography

4.2.2.4 Illustrations

Due that the creation of an illustration is not part of the process for this project, but would benefit the visual of the interface, the illustrator (Samantha) was kind enough to make them, since that my aptitudes for it are not good enough. A sample of those illustrations can be seen (Image 13).
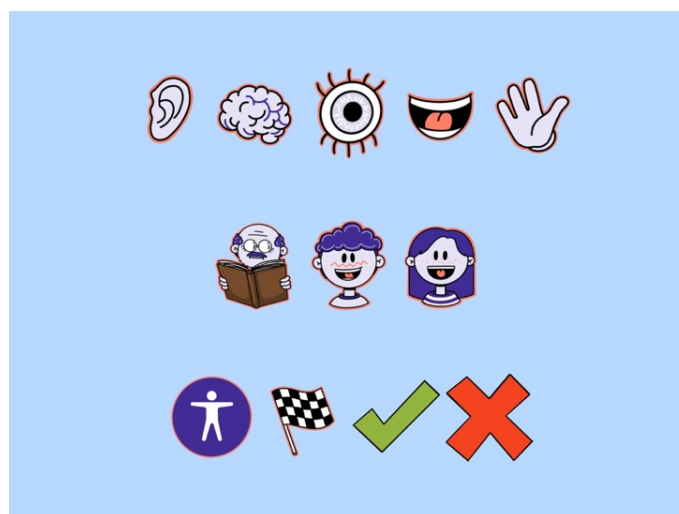

Image 13 - Illustrations

4.3 Information Architecture

Information Architecture (IA) is the practice of organizing, structuring, and labeling content to make it easy for users to find and understand. IA is essential in designing user-friendly websites and applications. It involves creating a blueprint of the website's structure, including the navigation, categories, and subcategories (Altexsoft, 2023).

By implementing best practices for information architecture, designers can create apps that are accessible to all users, including those with disabilities. When designing for digital accessibility, it's essential to consider the needs of all users. To ensure that an app is accessible to all users, designers should focus on creating a clear and intuitive navigation system. This includes using concise and descriptive labels for buttons and links, organizing content logically and easy to follow, and providing alternative text for images (Baig, 2023).

Inclusive design principles should also be considered when designing information architecture. This involves designing with empathy and understanding for users of all abilities and striving to create a usable and enjoyable app for everyone. By prioritizing digital accessibility and incorporating best practices for information architecture and inclusive design, designers can create apps that are not only accessible but also provide a better user experience for all (Baig, 2023).

4.3.1 Site Map

The site map was created using the information gathered during the research. It served as the foundation for the creation of the User Flow, Wireframes, and Wireflows. A *site map* is a diagram that visually represents the structure and hierarchy of a website or application. It shows how different pages or screens are organized and connected to each other. Its primary purpose is to provide a clear and logical overview of the navigation and content flow, making it easy for designers and developers to understand the system's architecture (Guthrie, 2022).
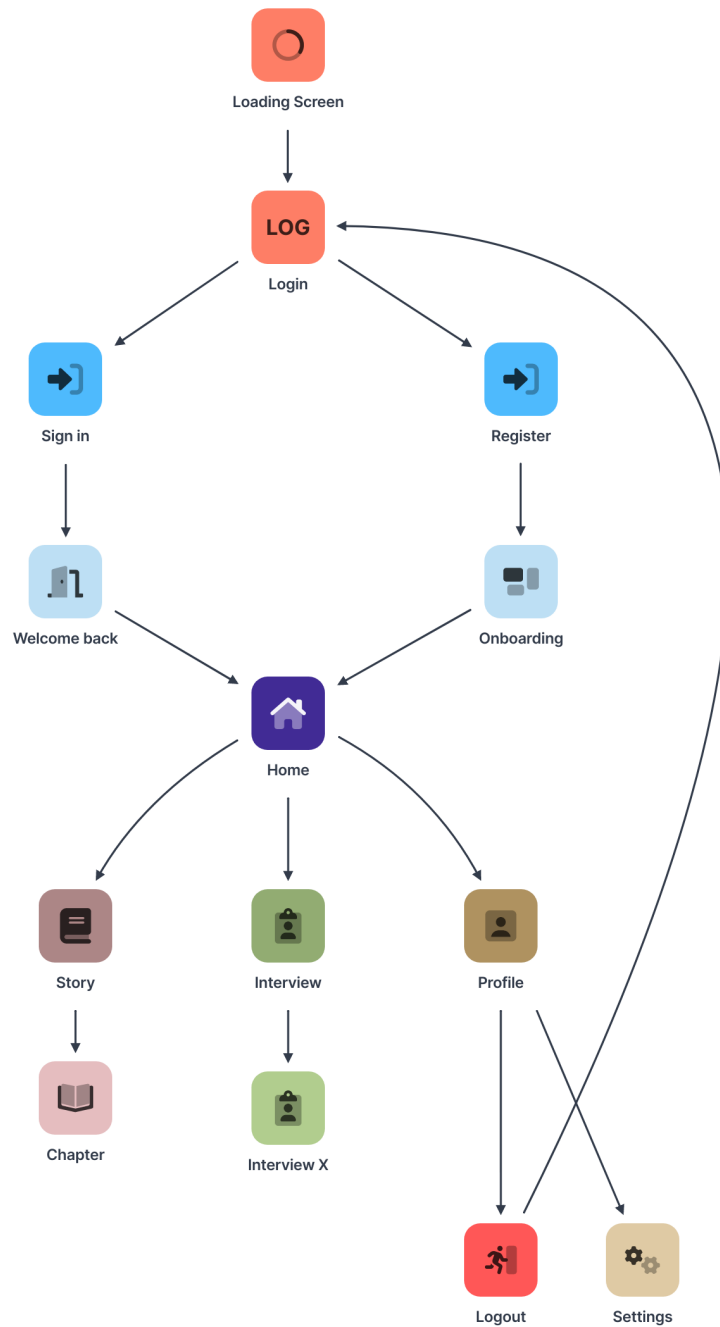
Image 14 - Site Map

4.3.2 User Flow

The user flow serves as an indispensable framework that elucidates the intricate array of interactions spanning across diverse sections, encompassing vital gestures like taps and swipes. Find on the next page a visual representation of the final user flow (Image 15).
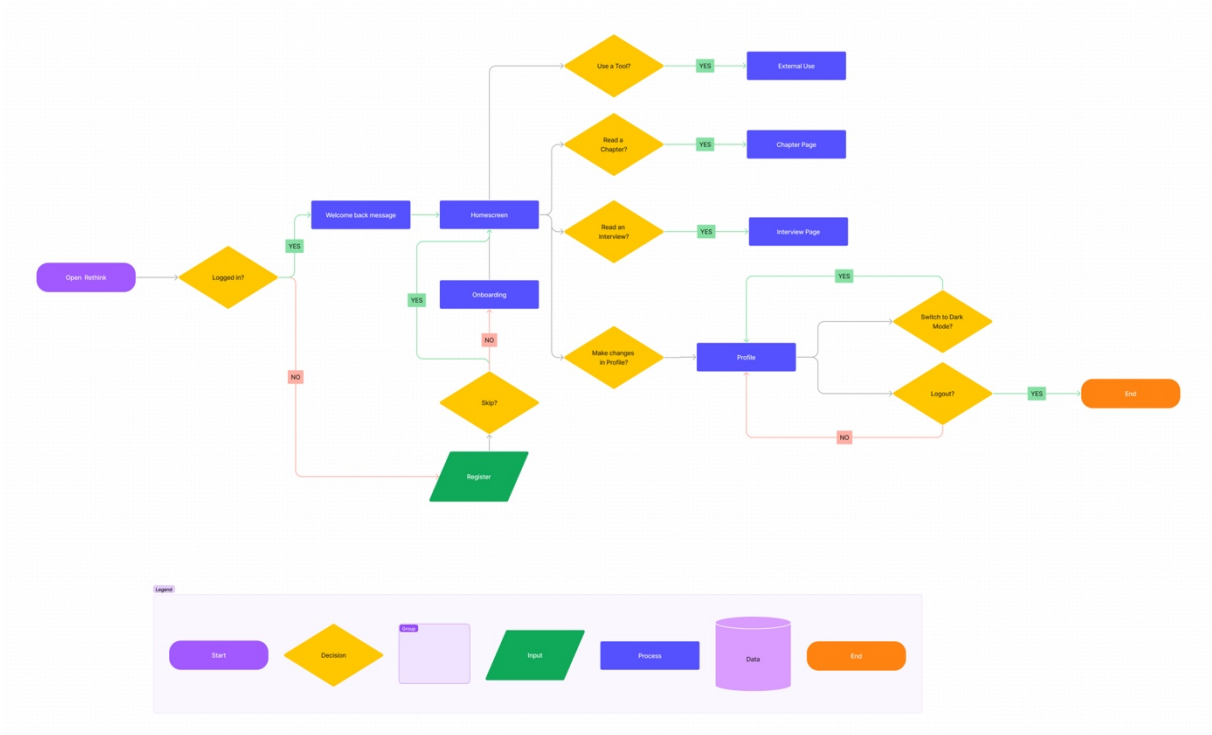
Image 15 - User Flow

4.3.3 Wireframes & Wireflows

Taking in consideration the previous stages of the Site Map and User Flow, initial sketches were drawn manually, in the image below the main sections can be seen "Onboarding", "Homescreen", "Chapter" and "Login".
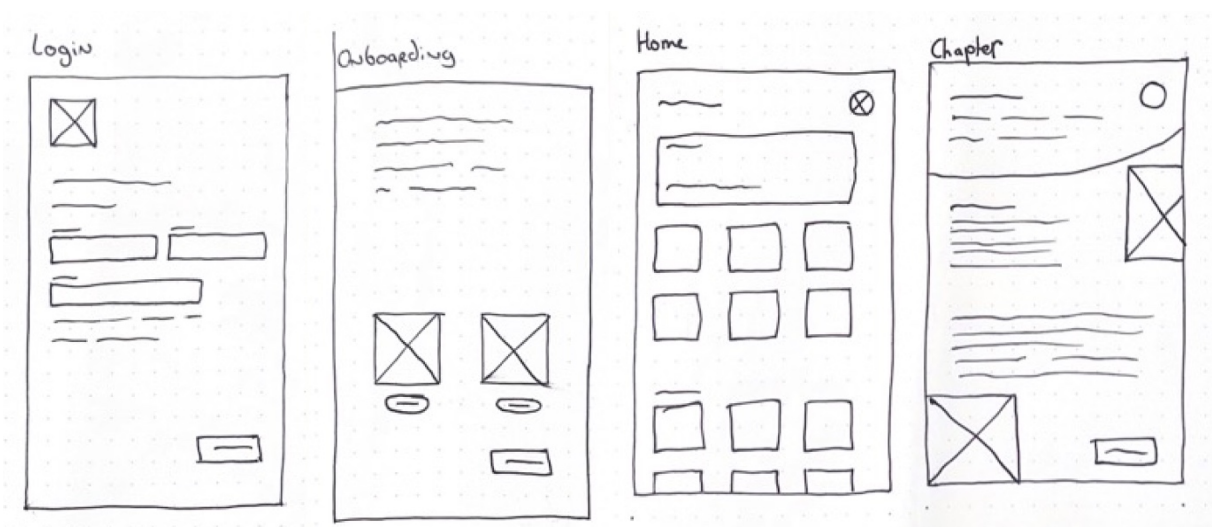

Image 16 - Sketches / Wireframes

The next step in the exploration of the interfaces involved transitioning to a digital platform, specifically utilizing the software Figma. This allowed for the precise definition of how the remaining interfaces would be rendered digitally.
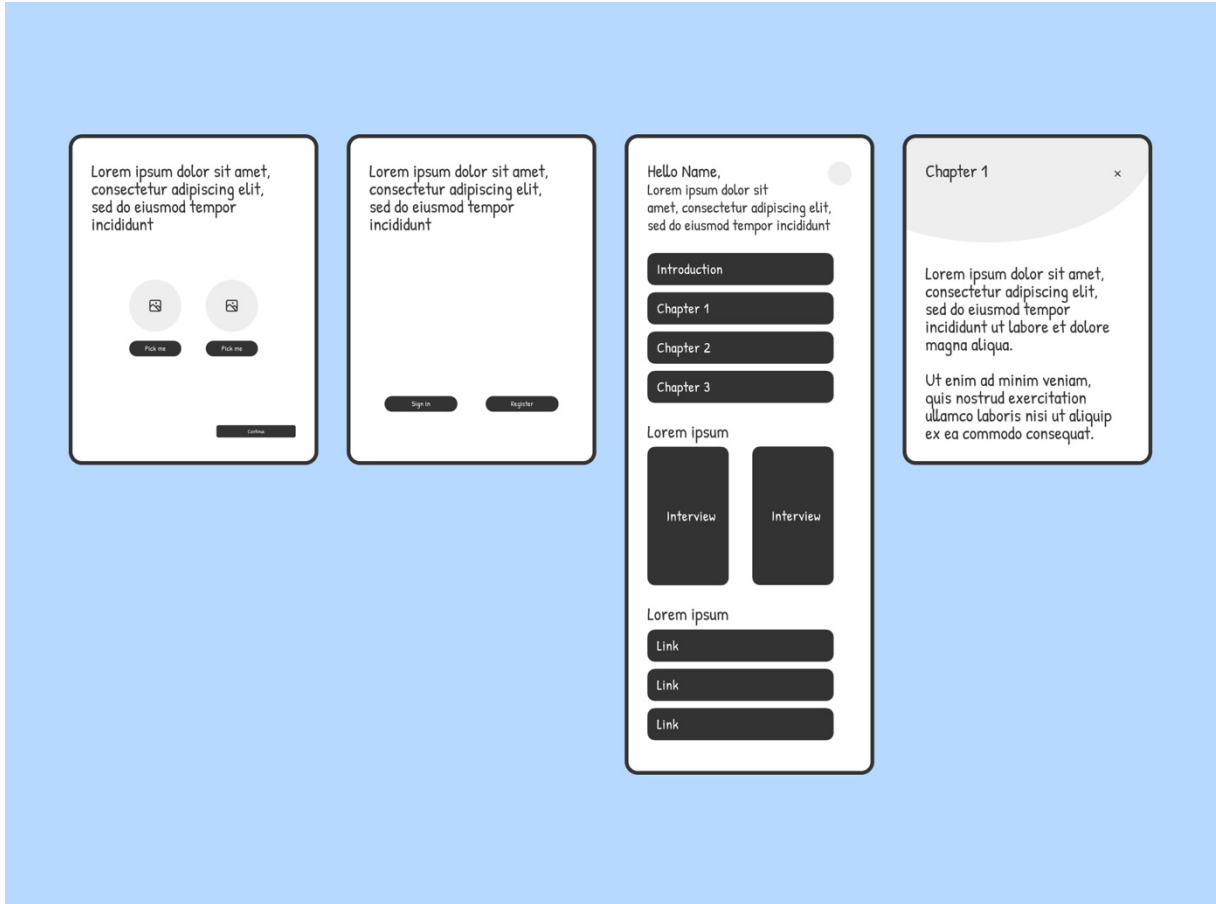

Image 17 - Digital Wireframes

The subsequent depiction showcases the conclusive wireflow, offering a comprehensive outline of all interactions between diverse sections, encompassing delays, taps, swipes, and external links. This visual representation ensures a lucid comprehension of the user experience and guarantees seamless navigation throughout the application.
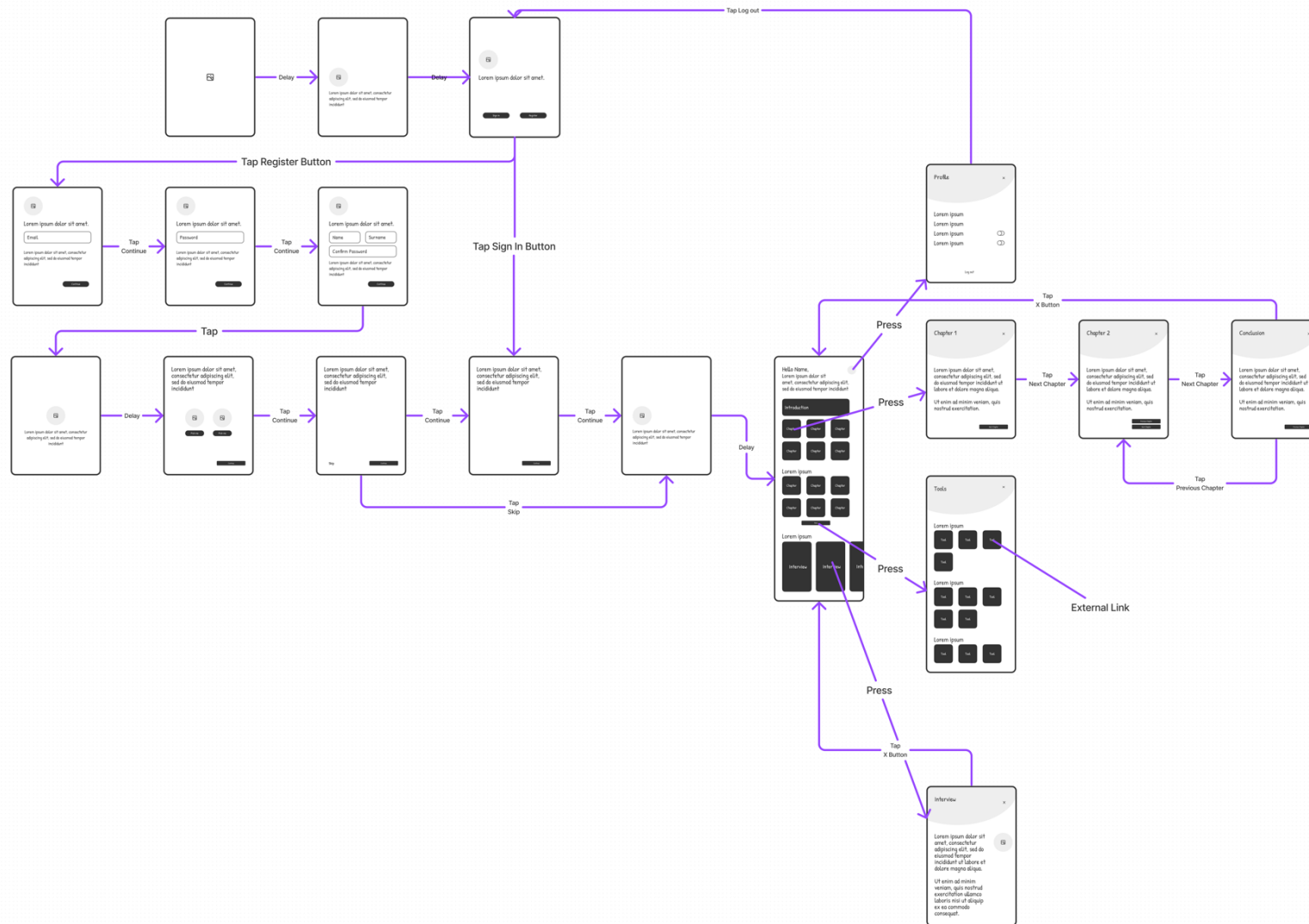
Image 18 - Wireflow

4.4 High Fidelity Prototype

Upon completion of the previous stages, including Information Architecture, Site Map, User Flow, Wireframes, and Wireflows, the final Prototype was developed. During this phase, the interface was populated with elements from the established Design System.

The purpose of the Onboarding process is to streamline and elucidate the application's functionality for the user. Additionally, users can select their preferred character during this process as shown below.
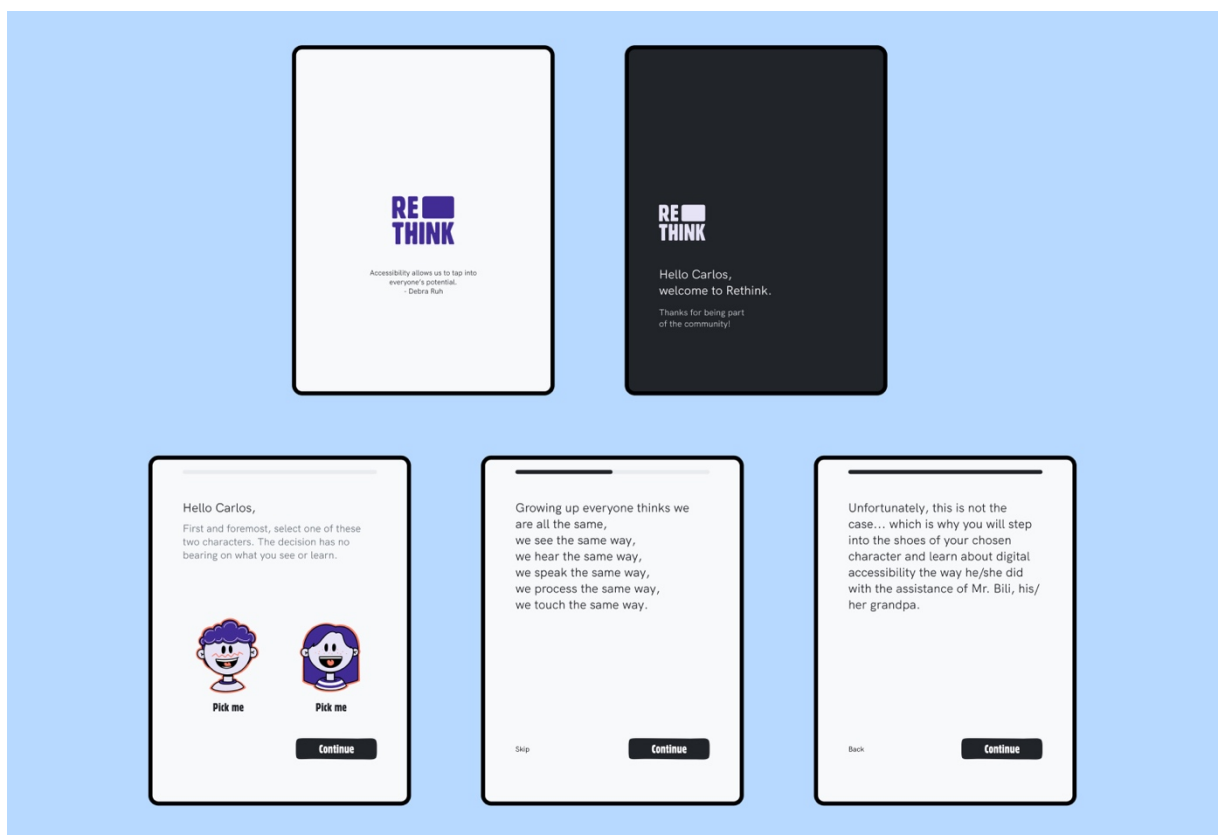

Image 19 - Onboarding Screens

The inclusion of a dark mode feature was implemented with the intention of aiding individuals with visual impairments. This feature can be located within the "profile" screen (Image 20).
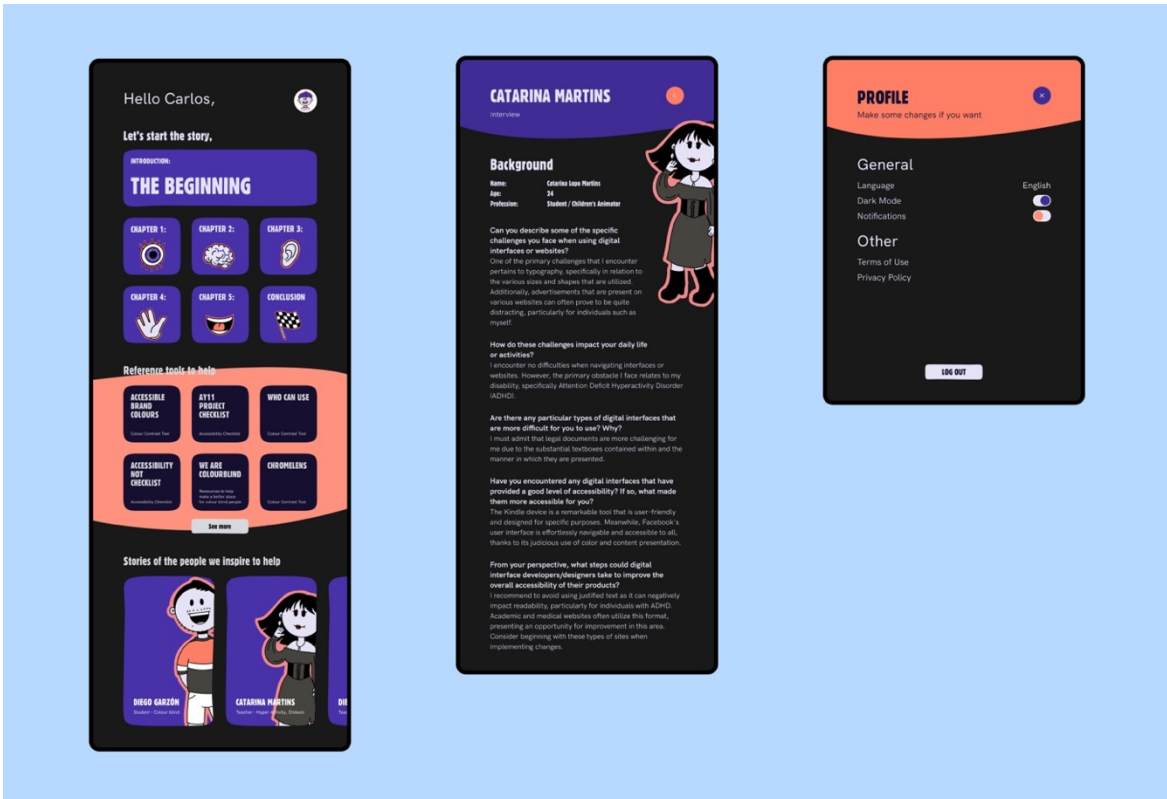
Image 20 - Dark Mode Screens

The High-Fidelity Prototype has been utilized for the purposes of conducting usability testing, with the analysis and results of said testing being made available in the sections that follow. A prototype video has also been recorded, which showcases the interactions that were tested during the aforementioned usability testing[3].

Upon completion of the final version of the prototype[4], the subsequent phase in the development process is to conduct user testing. This stage is expected to yield valuable feedback, which will potentially be utilized to refine the application and produce an enhanced version. The quality of the feedback obtained from this testing phase is anticipated to provide valuable insights that can inform the subsequent stages of the development process. It is also worth mentioning that inside the figma file other elements can be seen with more detail, like the personas, Wireframes, Userflow, Results from the Usability testing and more.

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[3] Interested parties may view the video by accessing the following link: https://youtu.be/cMo87xnSw7o

[4] The complete Prototype can be seen by accessing the following link: https://www.figma.com/file/1mduRTsoYVRrEYxQhKRdoG/Rethink?type=design&node-id=14%3A16&mode=design&t=FQ2K8X3eb5k4C0SM-1

4.5 Usability Testing

The user testing procedure was developed on the basis of the findings obtained from various UX techniques employed with the aim of obtaining the highest level of information possible prior to producing the High-fidelity Prototype. The primary objective of the user test is to validate the application's overall usability and graphical interface. In addition, the test aims to identify any potential flow-related issues and areas that may require improvement. By conducting this test, we can gain valuable insights into how users interact with the application, which can help us optimize its design and functionality. During this stage a created a visual and typographic representation about the research, the audience, and the session to get a clear view of all and organize it better. This part can be seen in the Attachment 2.

4.5.1 Recruitment

The recruitment process for this project was conducted by the author through leveraging social media channels and personal contacts within the design and development industries. At this stage, the author considered the various personas that represent the intended users of the application. This approach ensured that the recruitment process was aligned with the needs of the project and that the selected participants would provide valuable insights and feedback. During the testing phase, certain difficulties were encountered owing to the inability of some individuals to be physically present. As a result, the testing process had to be conducted remotely via video conferencing taking in consideration that the user owns a tablet to assure the right tool to use for the usability test.

4.5.2 Test Description

The testing was conducted in person and digitally, with the interviewer informing the participant that the test pertained to a digital accessibility application. The participant was provided with a tablet by the interviewer and given a small set of tasks to complete. No additional information was provided, as the participant's perception will be taken into consideration in future stages. Throughout the testing, the participant was instructed to vocalize any thoughts they may have had (Think Aloud Protocol).

Throughout the entirety of the test, the interviewer remains available and present to address any potential inquiries, concerns, or technical issues that may arise. During the interview the Interviewer also documents everything what is said and done a template of that document can be seen in Attachment 3. At the end of the test a questionnaire was giving to the user, to ask what their thoughts is about the Narrative and if it's comprehensive and if their knowledge about digital accessibility has improved see Attachment 4.

4.5.3 Participants

The valuation of the prototype was conducted using a convenience sample comprising 8 participants aged between 20 and 42 years. All the participants were professionals working in the Design or Development fields, and possessed proficiency in the English language, as the prototype and the test were conducted entirely in English. The educational level of all the participants was superior, with each possessing a bachelor's degree. Their technological proficiency levels ranged from mid-low to high.

4.5.4 Analysis and Results

Based on the results, it can be inferred that the majority of participants found the application's navigation to be effortless and enjoyable. The purpose of this phase is to methodically arrange and scrutinize all feedback received, and subsequently implement necessary enhancements to the application. This process is an essential facet of the project methodology, which can be easily identified in the Visual Methodology outlined earlier in this document. All gathered content, including audio comments and responses to the questionnaire, has been meticulously organized to produce lucid findings that can lead to objective conclusions.

Upon analysis of the combined data from every participant which can be found in the Attachment 5, it was evident that accessing all content posed no challenge as users were able to easily navigate to specific pages without difficulty. An additional technique for valuing a prototype is based on the most common types of comments extracted during usability tests. It is worth noting that, despite the incorporation of the "think aloud" technique in the testing process, two participants did not provide a substantial

amount of feedback while interacting with the prototype, the positive feedback can be found on table 1 and the negative feedback on table 2. This underscores the importance of carefully selecting participants and monitoring their level of engagement during usability testing.

During the usability testing, feedback was received regarding the illustrations and story elements, which were noted as being of significant importance. Additionally, some users commented on the positioning of the "next" and "previous" buttons, suggesting that they be swapped. These comments were considered valuable for improving the overall user experience and ensuring optimal functionality of the application.

Upon analysis of the Questionnaire, it was revealed that the responses were largely homogeneous. The initial query inquired "After interacting with the application did it help you understand more about digital accessibility and how to apply it?, and respondents indicated that it provided valuable insight in this regard. The second question asked "Did you understand the Story? What was it about?", with participants sharing their individual viewpoints. Finally, the third question inquired "You think the addition of Interviews with people with disabilities was a good idea to make the users see first hand where the problem lies?" and it received the most favorable feedback. This response suggests that firsthand cases of real-world scenarios are particularly effective in conveying the challenges of digital accessibility.

POSITIVE FEEDBACK

USER 1	*"IT'S VERY APPEALING VISUALLY AND CLEAN, DID YOU DO THAT?"*
USER 2	*"COMBINING THE ILLUSTRATIONS AND STORY IS REALLY WELL DONE, CONGRATS"*
USER 3	*"DID YOU DO THE ILLUSTRATIONS? THEY ARE NICELY REPRESENTED, LIKE IT'S EASY TO UNDERSTAND WHAT IT MEANS."*
USER 4	*"IT'S A CUTE STORY AND THE END IS ALSO FUN MAKES IT LOOK LIKE A LOOPHOLE."*
USER 5	*"I LIKE THE STORY, IT'S FUN BUT ALSO HEARTHY."*
USER 6	*"IT'S REALLY INTERESTING THAT THERE IS SUCH A VARIETY OF THINGS WE CAN DO TO IMPROVE INTERFACE."* *"SOME I ALREADY KNEW, OTHERS ARE TOTALLY NEW TO ME."* *"SUPER CLEAN AND INTUITIVE."*
USER 7	NOT MUCH WAS SAID DURING THE INTERVIEW *"GREAT STORY."*
USER 8	NOT MUCH WAS SAID DURING THE INTERVIEW *"I ENJOY THE COMBINATION OF COLOURS."*

Table 1 – Positive Feedback

NEGATIVE FEEDBACK

USER 1	"THERE IS A WEIRD INTERACTION HAPPENING, LIKE THE BUTTONS TAKE YOU TO THE BUTTOM OF THE PAGE." "THERE IS DOUBLE SPACING IN SOME PAGES."
USER 2	"IN MY OPINION I WOULD PUT PASSWORD AND RE-WRITE PASSWORD TOGETHER, BUT THAT'S JUST MY OPINION" "ALSO I DON'T LIKE HOW THE REFERENCE HEADER IS BEING CUT IN HALF AT THE BACK WITH BY THE COLOURS."
USER 3	"YOU COULD MAYBE ADD SOME INTERACTIVE ELEMENTS, IT MAKES THE PEOPLE USE IT MORE."
USER 4	NO NEGATIVE FEEDBACK WAS GIVEN HERE.
USER 5	"THERE ARE SOME GRAMMATICAL ERRORS, SMALL ONES." "YOU COULD ADD THE TYPE OF DISABILITY IN THE INTERVIEW PAGE, INSTEAD OF ONLY SAYING INTERVIEW."
USER 6	"I PERSONALLY WOULD, FIRST PUT THE STORY, THEN THE INTERVIEWS AND AT THE END THE TOOLS." "SWITCH THE NEXT AND PREVIOUS BUTTONS, NOT THAT INTUITIVE." "ADD A BUTTON AT THE END OF THE CONCLUSION PAGE, BETTER MORE BUTTONS THAN AN UNPRACTICAL ONE."
USER 7	NOT ENOUGH WAS SAID DURING THE INTERVIEW. "SWAP PREVIOUS AND NEXT CHAPTER BUTTONS."
USER 8	NOT MUCH WAS SAID DURING THE INTERVIEW "MAYBE CHECK THE TIPOS, I SEE SOME MINOR ERRORS."

Table 2 – Negative Feedback

5 CONCLUSION

5.1 Study Limitations & Future Work

Although the research provided valuable insights, it is imperative to recognize the limitations that impacted the scope and outcomes of the study. One of the principal constraints of the project concerns the participant pool's composition during usability testing, which proved challenging to obtain due to a limited response rate from potential participants. Additionally, the timing of the test posed difficulties, as many participants were unavailable at the designated time. These limitations should be acknowledged to provide a clear understanding of the research's potential impact and applicability.

A software limitation was encountered during the creation of a high-fidelity prototype while using Protopie, which presented a challenge due to limited knowledge of alternative software options. Subsequently, it was determined that sticking with the current software which was already being used for the Design System in this case Figma, was the most effective option, as it had already proven to be highly capable in this regard.

The forthcoming work of this project pertains to enhancing its quality. To achieve this objective, certain improvements must be implemented, namely, inclusion of interactive elements, incorporation of more consistent illustrations, provision of customizable character options, and addition of a concluding game. These proposed enhancements are expected to have a positive impact on the overall success of the project.

5.2 Final Considerations

This research project aims to bridge a critical gap in digital accessibility by validating an innovative interface through comprehensive research. In today's technology-driven world, digital interfaces are central, and ensuring accessibility is crucial. The research emphasizes the significance of accessible design and highlights the role of education in promoting inclusivity.

At the heart of this project is the objective to raise awareness about digital accessibility. In an era where technology is ubiquitous, it's essential to make everyone aware of the importance of accessible design.

The literature review conducted as part of this research identifies the multifaceted barriers hindering universally accessible digital experiences. One significant obstacle is the lack of accessibility knowledge among designers, resulting in unintended exclusion. To address this issue, we propose a storytelling-based approach that immerses users in the experiences of individuals with disabilities, fostering empathy for inclusive design principles towards the societal goal of equal access for all.

Moreover, the project aims to achieve high accessibility standards throughout the design process. This commitment ensures that the resulting interface is not only empathetic but also adheres to accessibility guidelines. Creating a user-friendly and distraction-free interface is integral to the project's objectives. The interface will be meticulously crafted to eliminate elements that might distract or hinder usability, making it accessible to a wide range of users, regardless of their abilities or impairments.

In essence, this research project brings together the pressing need for awareness, the pursuit of high accessibility standards, and the creation of a user-friendly interface. By providing accessible design tools to designers and developers, it aims to drive lasting change in digital creation.

In conclusion, this storytelling-based interface represents a transformative step towards advancing accessible design by promoting awareness, empathy, and inclusivity among designers and developers. The project aligns with the broader societal goal of creating a more equitable digital future. Through rigorous research, adherence to accessibility standards, and a commitment to user-friendly design, it strives to set new standards in the field of digital accessibility, ensuring that the digital world is truly accessible to everyone.

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ATTACHMENTS

Attachment 1 – Digital Accessibility Questionnaire

Do you know WCAG 2.0/2.1/2.2 Web Content Accessibility Guidelines? *

○ I have never heard of it

○ I have heard of it

○ I have some basic knowledge

○ I know it

○ I know it very well

How proficient do you feel you are in web accessibility? *

○ Not proficient at all

○ Not proficient

○ Somewhat proficient

○ Proficient

○ Very proficient

Please indicate to whom is web accessibility aimed for: *

	False	True	Not sure
Deaf people and people with other hearing impairments	○	○	○
Blind people and people with other visual impairments	○	○	○
Physically disabled people	○	○	○
People with other disabilities (cognitive, neurological, speech etc.)	○	○	○
People with "temporary disabilities" (with a broken arm or lost glasses)	○	○	○
People in bright sunlight or in an environment where they cannot listen to audio etc.	○	○	○
People using mobile phones, smart watches, smart TVs, and other devices with screens, different input modes, etc.	○	○	○
Older people with changing abilities due to ageing	○	○	○
People using a slow Internet connection, or who have limited or expensive bandwidth	○	○	○
People without internet access	○	○	○
Everybody	○	○	○

Submit   Clear form

68

HOW WELL ARE YOU FAMILIAR WITH THE CONCEPT OF WEB ACCESSIBILITY?

16.7%	NOT FAMILIAR
33.3%	SOMEWHAT FAMILIAR
33.3%	FAMILIAR
16.7%	VERY FAMILIAR

HOW IMPORTANT IS IT TO PROVIDE ACCESSIBILITY OF WEB IN YOUR OPINION?

50%	IMPORTANT
50%	VERY IMPORTANT

DO YOU KNOW WCAG 2.0/2.1/2.2 WEB CONTENT ACCESSIBILITY GUIDELINES?

16.7%	I HAVE NEVER HEARD OF IT
33.3%	I HAVE HEARD OF IT
33.3%	I HAVE SOME BASIC KNOWLEDGE
16.7%	I KNOW IT VERY WELL

HOW PROFICIENT DO YOU FEEL ARE YOU IN WEB ACCESSIBILITY?

16.7%	NOT PROFICIENT
50%	SOMEWHAT PROFICIENT
16.7%	PROFICIENT
16.7%	VERY PROFICIENT

Attachment 2 – Usability Testing Overview

About the research
4 cards

Goals

What do I hope to learn from this research?
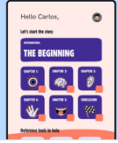
I hope to:

- uncover any usability issues in the reading of the story process
- see if people will have a better understanding of digital accessibility

What am I testing?

Describe the product or service you're testing. E.g. Prototype or final product.

An App (Rethink) for tablet to raise awareness and help people get a better knowledge about Digital Accessibility

Who's involved?

- Recruitment: Carlos Silva
- Note taker: Carlos Silva

Audience
3 cards

Who are the participants?

Describe your ideal participant. E.g. Customer type, age, technology use...

- 20-50 year olds
- Being involved in Design or Front- and Back- End Developers

How will you recruit them?

E.g. Market research? Our own customer base, run online ads.

I will recruit people I know that work in the field (Design or Front- and Backend Developers).

The sessions
3 cards

When and where?

What are the key dates, times and locations?

- Dates still to be seen
- Between 9am - 5pm
- At least 8 people

Format

What's the format and duration of each session?

- 45 minutes each session
- Unmoderated Observation testing based, with 3-4 tasks (Interviewee can help if they get stuck or have questions)
- 1-on-1 over in Person
- Each session will be voice recorded

Report
7 cards

Attachment 3 – Usability Testing Document

RE THINK

INTERVIEWEE:
Carlos Azevedo Silva
40210186@esmad.ipp.pt
+352 621 640 504
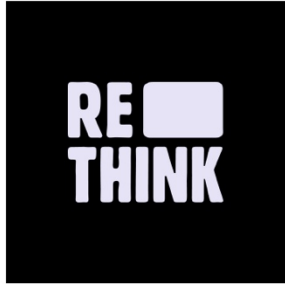
PARTICIPANT:
Name
Age
Job

TASKS

- Find the option to turn Dark Mode on.
  ☐ Completed
  ☐ Failed
  00:00,00 Time
- Check where you can find more Tools.
  ☐ Completed
  ☐ Failed
  00:00,00 Time
- Find the Skip option for the Onboarding
  ☐ Completed
  ☐ Failed
  00:00,00 Time

_____

POSITIVE FEEDBACK

- (Add text here)

_____

NEGATIVE FEEDBACK

- (Add text here)

ESCOLA SUPERIOR DE MEDIA ARTE E DESIGN   MESTRADO EM SISTEMAS E MEDIA INTERATIVOS

INTERVIEWEE:

Carlos Azevedo Silva
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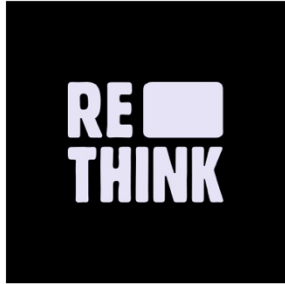**PARTICIPANT:**

TASKS

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- Find the Skip option for the Onboarding
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POSITIVE FEEDBACK

- Intro text very fast transition
- Visually appealing
- Nice feel

NEGATIVE FEEDBACK

- Next Chapter Buttons take you to bottom of page, change that.
- Check fonts maybe some double spacing
- Check heights of fonts
- More tools very low put it up

RE THINK

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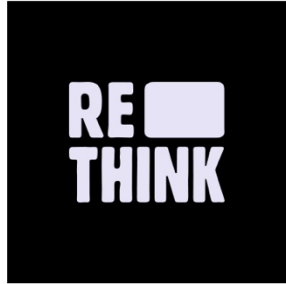+352 621 640 504

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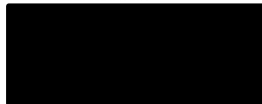
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POSITIVE FEEDBACK

- Good colour palette
- Like the typography
- Great combination with the illustrations and the story

NEGATIVE FEEDBACK

- Prefer Sign in and Log In
- rewrite Password, put it together don't separate, feels weird
- Reference Header, looks weird being cut
- Align the illustration with the Header or text

RE THINK

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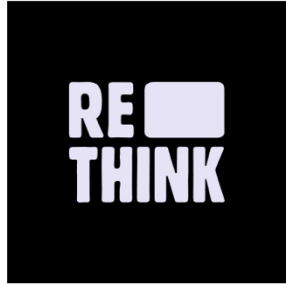+352 621 640 504

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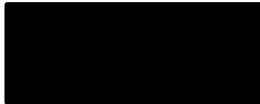
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POSITIVE FEEDBACK

- Easy to use
- There where things he already knew but some he didn't knew about
- Interesting Story
- Liked the illustrations a lot, nice executed and well presented

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NEGATIVE FEEDBACK

- Maybe change the layout and add some interactive elements, people like that probably will help understand it better
- Not a fan of the colours

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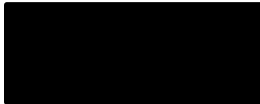
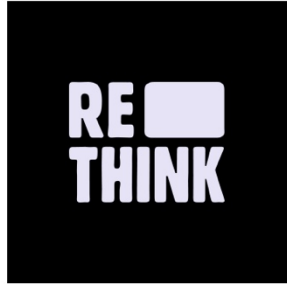**PARTICIPANT:**

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POSITIVE FEEDBACK

- Enjoyed the combination with the story and illustrations
- Liked the heartily story

NEGATIVE FEEDBACK

- (Add text here)

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POSITIVE FEEDBACK

- Enjoyed the story, funny in a way

NEGATIVE FEEDBACK

- Some grammatical errors you need to check
- Add the disability in the interview page

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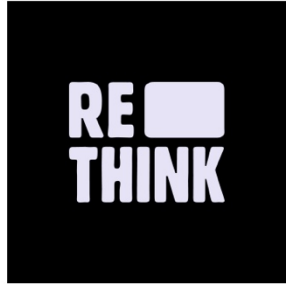**PARTICIPANT:**

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POSITIVE FEEDBACK

- Design is clear and intuitive

NEGATIVE FEEDBACK

- Change the hierachry, First the story, interview and then the tools.
- Change the next and previous buttons, next last.
- Conclusion: Add a button at the end of the page to go back. More practical
- Interview: Also add a back button at the end, better two buttons then one unpractical

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POSITIVE FEEDBACK

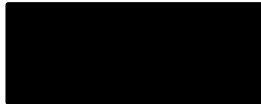- Great story, making the user feel every part of it

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NEGATIVE FEEDBACK

- Maybe swap the buttons for next and previous chapter

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POSITIVE FEEDBACK

- Liked the colours and story great combining them

NEGATIVE FEEDBACK

- Check tipos

Attachment 4 – Rethink Feedback Questionnaire

AFTER INTERACTING WITH THE APPLICATION DID IT HELP YOU UNDERSTAND MORE ABOUT DIGITAL ACCESSIBILITY AND HOW TO APPLY IT?

YES, IT IS AN INTERFACE THAT EXPLAINS IN AN EASY AND INTUITIVE WAY HOW TO DESIGN FOR PEOPLE WITH LIMITED ACCESSIBILITY.

YES. IT PROVIDED INTERESTING INFORMATION REGARDING IT, AND I KNOW I FEEL I CAN UNDERSTAND IT A BIT BETTER.

YES, AFTER USING THE APP, I COULD SEE HOW CHALLENGING IT COULD BE FOR SOME INDIVIDUALS TO USE WEBSITES AND APPLICATIONS WITHOUT BUILT-IN ACCESSIBILITY FEATURES FOR THOSE WITH IMPAIRMENTS.

IT HELPED A LOT AND IT WILL BE AN APP I WILL FOR SURE USE TO HELP ME CREATE MY OWN PROFESSIONAL PAGE ON INSTAGRAM IN ORDER FOR IT TO BE AS ACCESSIBLE AS POSSIBLE FOR EVERYONE.

YES, IT'S NICE TO SEE AND UNDERSTAND THAT THESE ARE TOOLS THAT CAN SHOW US HOW TO CREATE SOMETHING FOR PEOPLE WITH SOME DISABILITY.

YES, DIGITAL ACCESSIBILITY IS GETTING MORE IMPORTANT EVERYDAY, THE WAY IS SHOWN ON THE APPLICATION, THE DESIGN, THE PROBLEMS, THE TO DO´S, AND THE HISTORY ITSELF, HELPED ME TO BETTER UNDERTAND WHAT I COULD AS A DEVELOPER TO DEVELOP BETTER WEBSITES WITH A GOOD DIGITAL ACCESSIBILITY!

YES

DID YOU UNDERSTAND THE STORY? WHAT WAS IT ABOUT?

YES, IT REPRESENTS THE STORY TOLD BY A GRANDFATHER TO HIS GRANDCHILDREN ABOUT HOW DESIGN SHOULD BE APPLIED AND NOT APPLIED, IN ORDER TO ASSIST PEOPLE WITH ACCESSIBILITY ISSUES.

YES. IT WAS A NICE PERSPECTIVE AND A STORYTELLING ABOUT DIGITAL ACCESSIBILITY, PLACING SEVERAL PEOPLE IN THE CENTER OF A DISCUSSION ON HOW TO MAKE INFORMATION MORE VISUALLY APPEALING AND EFFICIENT.

YES, THE TALE DISCUSSES OTHER PEOPLE'S LIVES WHO HAVE IMPAIRMENTS INCLUDING MOTOR, VISUAL, SPEECH, AND COGNITIVE ONES AS WELL AS MANY APPROACHES TO ENHANCE APPLICATIONS AND WEBSITES SO THEY CAN ACCOMMODATE ALL TYPES OF INDIVIDUALS, DISABLED OR NOT.

THE STORY WAS ABOUT A GRANDPA TEACHING HIS GRANDAUGHTER/GRANDSON ABOUT DIGITAL ACCESSIBILITY AND THE TOOLS TO MAKE THE DIGITAL WORLD MORE ACCESSIBLE TO ALL HUMANBEINGS WITH OR WITHOUT DISABILITIES

IT'S ABOUT AN OLDER PERSON TELLING THEIR GRANDCHILDREN THAT SOME PEOPLE SEE THE WORLD DIFFERENTLY AND WHEN WE FEEL THAT WE CAN'T HELP THEM, WE CAN FIND TOOLS LIKE THIS APP TO HELP US HELP THEM.

I T WAS ABOUT A FAMILY WITH DIFFERENT DISORDERS AND THE PROBLEMS THEY FACED BECAUSE OF HAVING THOSE DISABILITIES!

YES, I FOUND IT INTERESTING HOW THE CHARACTERS IN THE APPLICATION PERCEIVE PEOPLE WITH DISABILITIES.

YOU THINK THE ADDITION OF INTERVIEWS WITH PEOPLE WITH DISABILITIES WAS A GOOD IDEA TO MAKE THE USERS SEE FIRST HAND WHERE THE PROBLEM LIES?

SIM, HISTÓRIAS REAIS SÃO SEMPRE FUNDAMENTAIS PARA PERCEBER NA PRÁTICA AS DIFICULDADES QUE AS PESSOAS TÊM.

YES. I THINK IT CAN HELP PEOPLE FEEL MORE RELATABLE TO OTHER USER'S NECESSITIES AND TO HUMANIZE IT. IT CAN MAKE US FEEL THAT ARE MORE PEOPLE LIKE US ELSEWHERE.

SEEING THE WORLD THROUGH THE EYES OF OTHERS IS CRITICAL IN THIS ENVIRONMENT (APP AND THE WEBPAGES), AS WELL AS UNDERSTANDING THEIR POINT OF VIEW AS A PERSON WITH A HANDICAP IN THIS DIGITAL WORLD.

IT WAS A VERY GOOD IDEA BECAUSE, FOR THOSE WITH NO DISABILITIES, IT WIL ALLOW THEM TO SEE INTO THE WORLD OF THOSE WITH DISABILITIES AND GET SOME TOOLS AND KNOWLEDGE ON HOW TO MAKE THE DIGITAL WORLD MORE ACCESSIBLE TO THEM; AND TO THOSE WITH DISABILITIES IT WILL ALLOW THEM TO IDENTIFY THEMSELVES WITH THE ONE THAT WAS INTERVIEWED AND FEEL SOME SENSE OF BELONGING AND UNDERSTANDING ON HOW THEY SEE THE WORLD AND HOW IT WOULD BE EASIER TO GET ACCESS TO THE DIGITAL WORLD. I BELIEVE THE INTERVIEWS ARE LIKE PRACTICAL EXAMPLES AND WE ALWAYS UNDERSTAND THINGS BETTER WHEN WE ARE SHOWN EXAMPLES, ESPECIALLY PRACTICAL ONES; THEREFORE, THE INTERVIEWS SEEM TO APPEAR AS PRACTICAL EXAMPLES OF THE DISABILITIES AND HOW PEOPLE MANAGE THEIR LIFES IN REGARDS TO THE DIGITAL WORLD AND HOW IT AFFECTS THEIR DAILY LIFE. THIS EXAMPES ALLOW PEOPLE WITH NO DISABILITIES TO GET AN INSIGHT ON HOW TO ADAPT THE DIGITAL WORLD TO THOSE WITH DISABILITIES.

YES, IT'S A GOOD IDEA TO SEE THE TESTIMONIAL OF DIFFERENT PEOPLE THAT WAS TO DEAL WITH THIS DAILY AND EXPERIENCE THIS PROBLEM THAT, PEOPLE WITH NO DISABILITY NEVER NOTICE OR UNDERSTAND.

DEFFENETLY, THERE IS NO BETTER WAY TO DETEC A PROBLEM AND SOLVE A PROBLEM THET DOENT ENVOLVE GOING TO THE ""FIELD" / ROOT OF THEM! BY INTRUDUCCING REAL CASES IS THE BEST WAY TO SEE HOW DIGITAL ACEESABILITY AFFECT OTHERS AND WHAT THEY STRUGGLE WITH, THEN IT WILL BE EASIER TO FIND SOLUTIONS FOR IT!

YES, IT MAINLY HELPED TO UNDERSTAND THE REAL PROBLEMS OF THESE PEOPLE.

Attachment 5 – Usability Testing Report

Things that worked

Narrative
- Interesting/ Great Story
- Good combination with illustrations

Interface
- Easy to Use, Nice Feel
- Visually Appealing

Things to improve

Interface
- Header for Reference looks weird
- Swap previous with next chapter button
- Add button at the end of conclusion, better have more buttons than a unpractical one

Interview
- Add the type of disability on the interview page

Transition
- Slower transition