CHALMERS
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Designing a Categorisation User Interface

Guidelines to applying user expectations and accessibility when designing a categorisation interface of benefits and deals

Master's thesis in Interaction Design and Technology

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Abstract

Benify's platform hosts nearly 10,000 benefits and deals. However, users have encountered difficulties in navigating and finding the benefits they are looking for. The objective of this project is to examine and redesign the representation of benefits and deals, ensuring consistency and addressing user needs. Simultaneously, the design aims to achieve AA-level accessibility according to the WCAG guidelines, accommodating the diverse requirements of users. This thesis aims to answer the research question "What should be considered when designing a categorisation interface?"

To attempt this, a literature review was conducted on previous findings for universal design and accessibility, information architecture and categorisation. The following stages followed the double diamond design process to gather data on user expectations of categorisation, possible usability problems and the creation of wireframes for web and mobile versions of the application. Throughout an iterative design process, the created wireframes explored key points such as accessible navigation and user expectations for categorisation. The thesis resulted in eight guidelines to develop effective categorisation and accessible navigation, which aims to provide a better user experience.

Keywords: UX-design, accessibility, WCAG, user expectations, categories, navigation, information architecture, master thesis.

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Johanna Grahn & Linnéa Tulldahl , Gothenburg, 2023-06-27

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1

Introduction

This master thesis is in collaboration with Benify, an HR tech company based in Gothenburg that provides a benefit and total reward platform for companies. Benify strives to reinvent how modern employers engage their workforce by creating a consistent and unique experience by providing personal benefits and rewards to every employee. Benify has observed that users struggle with navigation within their menus regarding benefits and deals. An exploration has therefore begun regarding the possibilities of creating a new redesign and structure of the categories to help the users efficiently navigate amongst their offers and easily find what they are looking for.

Furthermore, Benify aims to understand what its users think about benefits and deals and understand their mental models of how they expect the individual items to be grouped. This thesis project will help and assist Benify with their categorisation representation and - based on their users' expectations - reevaluate and explore new design solutions that correlate with the client's mental models.

The principles of universal design cover how to design for various user groups, and can be narrowed down further in accessible design. In this project, we aim to create an accessible design based on the WCAG guidelines, more specifically aimed at visual impairments. Accessible design is mandatory for Benify and their interface aims to achieve the AA level. Benify has had previous contact with SRF, The Swedish Association of the Visually Impaired, which we aim to collaborate with regarding how to design for visual impairments.

The representation of categories will therefore be based on user research with people who are visually impaired and gain an understanding regarding their mental models of the grouped benefits and deals. The categorisation mentioned will be based on design principles often implemented with information architecture. Lastly, the thesis will present guidelines for creating a categorisation interface.

1.1 Problem Statement

Benify has almost 10 000 benefits and deals available on its platform. The offers are categorised into several different levels and users of the platform have reported difficulty in navigation. The problem aimed to be solved is thereafter how to re-design the representation of the benefit and make them consistent based on data gathered from user evaluation. The design should simultaneously achieve AA-level accessibility based on the WCAG guidelines and accommodate these and user needs.

1.2 Research Question

What should be considered when designing a categorisation interface?

1.3 Limitations

This Master's thesis project is in collaboration with Benify to examine existing problems regarding category structures, information architecture and user interface. Furthermore, examining how to improve the user experience from an accessibility standpoint. However, investigating pain points in the current Benify platform might lead to complex discoveries that within the time frame of this project, can not be analysed further. Therefore limitations of this project have to be addressed. There are benefits that are structured into categories on Benify's platform but there is also a separate page containing separate categories with deals labelled "benifyDeals". Early on it was noticed that the inconsistencies in the benefits category structure and how to improve the navigation of the user interface was a lot to examine within the timeframe of this project. Therefore the project is limited to not handling the structure and contents of benifyDeals.

Furthermore, this project will create a design solution for the interface and navigation of the benefits categories. However, Benify has a large number of individual benefits that differ for each user depending on the company and position. The benefits contain unique descriptions and information necessary to utilise the benefit. Therefore, creating a layout for separate individual benefits pages would be difficult to do and will instead take the current individual benefit pages into account. Moreover, since the categories are structured differently depending on the employer, this project will base the re-design on the version of Benify's platform for their own employees. Additionally, due to the time limit and the fact that both a web version and a mobile application will be designed, potential design improvements and iterations after the usability test might be limited. Aspects of the design that should be improved and further developed after the final usability test will be discussed in Chapter 8 *Conclusion*.

Due to the time limit, limitations were set regarding the design of a filter and search function for the mobile version of the redesign. Focus was mainly placed on creating these designs for the web and understanding their role and functionality in the

prototype. It was determined that a filter and search function was important, but not vital for this project, in order to reach a conclusion regarding accessible design. Emphasis is therefore placed on creating an accessible interface and categorisation, and the filter and search are viewed as a project for future work.

Regarding accessible design, many different variants of impairment should be considered when designing user-friendly websites and mobile applications. Since Benify has had earlier connections to SRF, a decision was made to in this project specifically aim to research how to improve design and navigation for visually impaired users.

2

Background

This section will disclose the design of the current Benify platform and the implemented information architecture for both mobile and web. The structure of categories will also be discussed in this section as well as how the benefits and deals are sorted.

2.1 Current Benify Interface

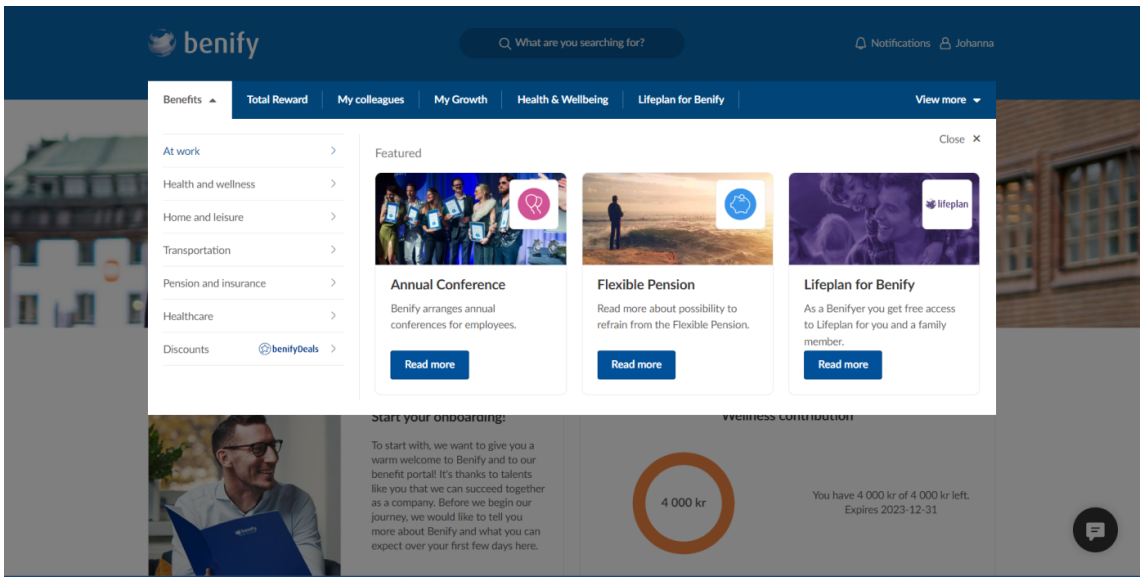

Figure 2.1: The current Benify Web drop-down menu

When a user enters the Benify web platform they can choose to view the benefits and deals by pressing the drop-down menu on the far left of the tabs. They are presented with six different categories of benefits as well as the option to view benefit deals. Furthermore, three featured benefits are placed to the right of the categories that the user can access instantly (See Figure 2.1). When a user selects one of the categories they are redirected to a new page where they can see the available subcategories and an overview of the relevant benefits (See Figure 2.2). The user can either choose to scroll through all the benefits for their chosen category or navigate by the sidebar navigation to the left. Once again, if a user selects a subcategory the page will

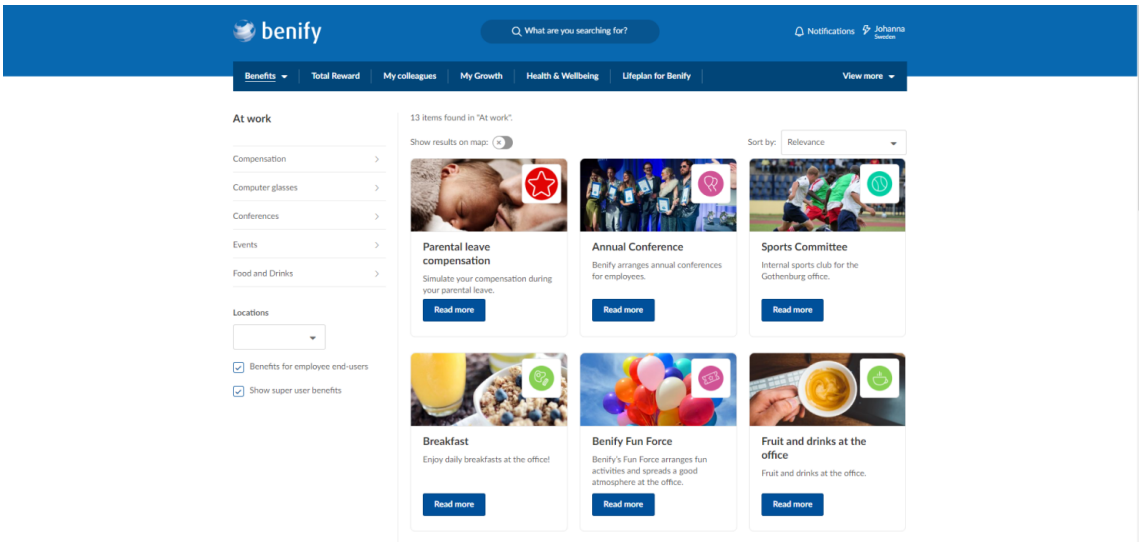

Figure 2.2: The current categorisation representation

update and reveal only the relevant benefits to the left and the chosen subcategory to the right. If a user wishes to go back to overview the subcategories, they can press the return arrow located beside the subcategory header. However, if a user wishes to navigate to an entirely different category they have to utilise the initial drop-down menu.

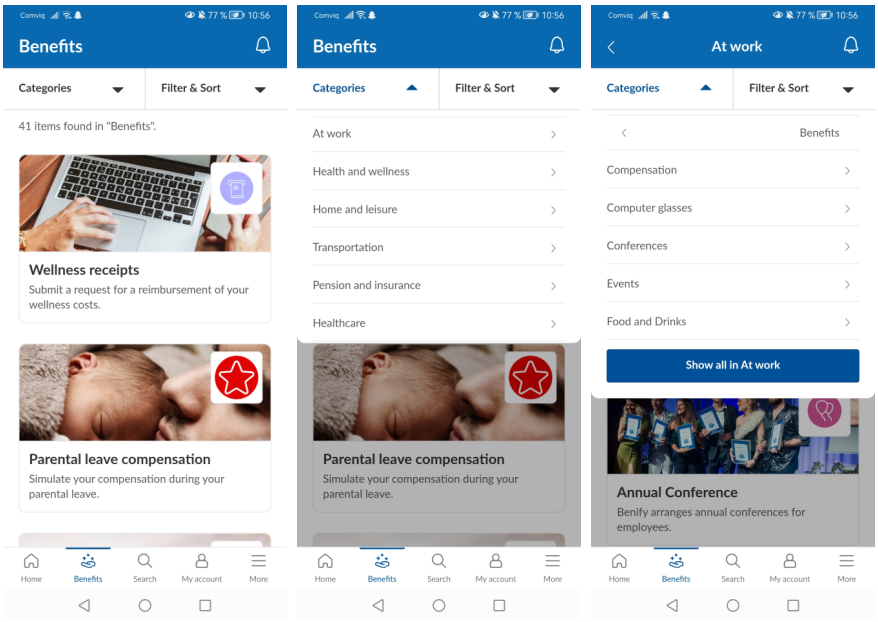

Figure 2.3: The current Benify mobile version UI

The mobile version of the Benify platform can be accessed through their app. The premise is the same as for their web platform and the categories are structured alike. When a user chooses to view the Benefits they are presented with a list of various selected benefits and can find the different categories by using the drop-down menu in the left corner[1]. The user can either choose to view all benefits in that given

category by exiting the drop-down menu or select a subcategory (see Figure 2.3). The BenifyDeals tab is in some instances hidden in the drop-down menu and the user has to scroll to find it. Furthermore, when a user selects a benefit or discount they are redirected to a new page where they can find the available information under open tabs.

Benify currently has two categories for their offers, Benefits and BenifyDeals. Some offers in Benefits are specific to the company of the user and some examples may include available sports clubs with the company, volunteering or a company car. The Benefits also include information regarding salary, pension and maternity leave and act as a collected source of information for employees. Benefits are overall connected to the company, whereas BenifyDeals are equal for all Benify users. BenifyDeals offer discounts on products and users may search here for campaign codes or special offers. There are a lot of categories in this section that feature a vast amount of products.

2.1.1 Benefits

As mentioned, all benefits are placed under various main categories with corresponding subcategories. Several benefits can be found under multiple categories in order to facilitate navigation for the user. The name and amount of categories vary from company to company as they are dependent on their respective offers. There is however an overlap in the offers of benefits between the majority of companies and they were taken into consideration when creating the user tests.

Moreover, the structure and navigation of categories are identical, regardless of the company. Every user can access the benefits by first selecting a main category and then utilising a subcategory to narrow down their search. However, these categories have different labels depending on what the company offers. A decision was therefore made to base the redesign on Benify's user interface and implemented colour scheme. The aim of the redesign, however, is to create a design that can be applied to several different companies.

Benify currently has six main categories that all have a varied amount of subcategories. *At Work, Health and Wellness, Home and Leisure, Transportation, Pension and Insurance* and *Healthcare*. These categories only exist on Benifys platform, as they are related to their specific offers for employees. Table 2.1 depicts all main categories and their related subcategories.

Main Category	Subcategories
At Work	"Compensation", "Computer glasses", "Conferences", "Ergonomics", "Food and Drinks", "Massage and treatments" and "Massage at work"
Health and wellness	"Benfits Online", "Climbing", "Dance", "Ergonomics", Give up smoking and snus", "Golf", "Gym and Classes", "Health and Physical Tests", "Lifestyle Consultation", "Massage and Treatments", "Massage at Work", "Ongoing Membership", "Personal Training (PT)", "Race Registration", "Register Receipts", "Running Course", "Skiing", "Training and Health", "Wellness during Pregnancy" and "Yoga and Pilates"
Home and Leisure	"Advisory and Coaching", "Cars", "Charity Donations", "Cinema", "Food and Drinks" and "Help at Home"
Transportation	"Bike", "Business Trips", "Cars", "Compensation", "Currency Exchange" and "Public Transport"
Pension and Insurance	"Compensation", "Lifeplan Pension Service", "Occupational Pension" and "Pension School"
Healthcare	"Chiropractory and Naprapathy", "Dental Care", "Fertility Treatments", "Health Checks", "Healthcare", "Physical Therapy", "Vacation and Healthcare Tests" and "Vision Defect Treatments"

Table 2.1: Current Categorisation of Benefits on Benify

2.1.2 BenifyDeals

BenifyDeals are available under "Discounts" in the drop-down menu and are divided further into separate categories and subcategories on the Benify platform (see Figure 2.4). The deals are not employer specific and are available for all Benify users. The majority of deals are discount codes that can be used when ordering from companies or booking services online.

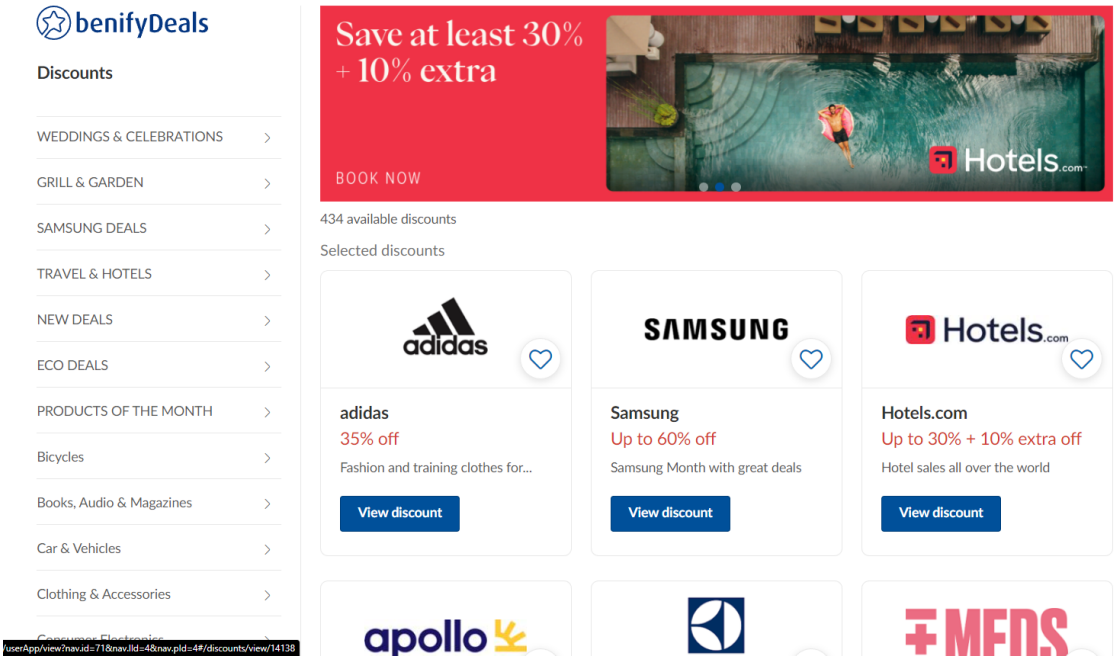

Figure 2.4: The BenifyDeals category structure

3

Theory

This section offers an explanation of the theories and background that will be considered during this project.

3.1 Universal Design

There are various definitions of universal design, but the main notion of the concept is to create an environment or product that can be used by anyone. The goal is to include people of all ages or possible impairments without them having to adapt the product itself. Sources state that a well-implemented universal design often goes unnoticed by the users since they are seamlessly integrated with the environment [2].

Accessible design is not always synonymous with universal design. Accessible design is described as the design of a product that lives up to certain requirements, intended to allow usage for people with impairments. This design form often manifests as separate solutions and features compared to its original use. This can lead to the segregation of users with impairments as they are not designed from the beginning. Accessible designs are often added on later to the design of a product and reflect a poorly executed design process that excludes certain users [2].

Universal design, on the other hand, integrates accessibility from the initial stages of the design process and is thereafter less likely to be noticed by the user. The aim of universal design is to change the environment for people so they can use it as smoothly as possible and not have to make any alternative changes themselves. The people who use the product should not have to adapt in order to use it, but should instead already be included in the design [2].

There are seven principles of universal design with accompanying guidelines, that are used to guide the design process towards a more inclusive design. Moreover, the principles can be used to evaluate already existing products or designs and also create a tangible measurement of how to achieve the universal design. However, more development has to be done in order to make the adaptation of these principles easier [2]. Despite the improvements in the field of universal design, it has not

evolved enough to develop truly universal products that cater to people with and without impairments alike [3].

Our purpose is to apply the concept of universal design to the design and the categorisation representation on the Benify platform. By utilising the seven principles of universal design continuously throughout the design process, the aim is to ensure that the new design will be inclusive and can be used by everyone. The main focus will be on users with visual impairments, however, the seven principles will hopefully make the design more inclusive to people with diverse abilities.

3.1.1 Visual Impairments

There are many communities surrounding people with impairments that are affected by the inaccessibility of modern technology. Visual impairments, in particular, pose significant challenges as the reliance on digital interfaces makes it difficult for people with visual impairments to access information. There are various categories of visual impairment including low vision, colour blindness as well as total blindness [4].

Low Vision

According to The American Academy of Ophthalmology, a person has low vision if clear vision cant be provided by ordinary glasses, contact lenses or intraocular lens implants [5]. Low vision generally means that the vision does not meet the needs of the person, whether that be a mild or severe case. Additionally, people affected by low vision can still have useful baseline eyesight and use visual devices to enhance their sight [4].

There are specialized monitors and software that individuals with low vision can use that increase the size of text and images so that they become large enough for the person to see. However, using absolute font sizes on websites makes it difficult for specialized devices to make adjustments. Furthermore, certain font styles such as italic text might cause difficulties for low-vision users to read without assisting software [4].

Colour Blindness

Colour blindness often causes people to have difficulties distinguishing pairs and/or combinations of colours. There are retinal photoreceptors at the back of the eyes that pick up colour. The photoreceptors are red, green and blue and detect different light wavelengths. Individuals with colour blindness have fewer photoreceptors than usual, causing colours to be confused. colour blindness can vary among individuals, causing some people to be more or less colour-blind [4].

The two most common variations of colour blindness that are inherited are called protanopia and deuteranopia, which are red-green colour vision defects caused by the absence of red or green retinal photoreceptors. Studies with participants of

Northern European ancestry show that 8 percent of men and 0.5 percent of women experience red-green colour blindness [6].

Accessibility issues on the Web that concerns colour-blind individuals often regard colour combinations that either do not provide high contrast or are not coordinated properly. Additionally, images that lack alternative text also inconvenience colour-blind individuals, especially when the nature of their blindness affects the ability to see what the image portrays [4].

Blindness

There are various degrees of blindness. People who are defined as being blind often do have some measure of eyesight, limited as it might be. A person who lacks sight completely is considered to have total blindness. Additionally, a person with sight less than or equal to 20/200, even with glasses is also considered blind in a legal sense. Some conditions and diseases can contribute to or be the cause of blindness, many of which are more prevalent with ageing. For example, cataracts, diabetes, and multiple sclerosis [4].

It is challenging to improve Web accessibility for people who are blind because a major aspect of the Web is that it is an interface which relies on the visual aspect. Furthermore, images without associated text, frames, tables, forms, and/or interactive content are just a few of the issues that affect blind users [4].

3.1.2 Accessibility Research

Sources state that research has not been attentive towards people with impairments. This in turn causes an issue of equity and in order to overcome this, designers and researchers have to work together with the relevant impairments community [7]. Current representations are premised on the assumptions regarding the user's cognitive, functional and sensory skill levels, which ultimately leads to limited access to the benefits of representations and the content it holds. A change needs to be made regarding accessibility, and make it an adequate priority in design, and this, in turn, could benefit everyone and not only users with impairments [7].

Research regarding visual impairments in design has to accommodate for deficiencies in colour apprehension. A vital notion is regarding how to present visual information in a nonvisual manner. WCAG guidelines propose a textual description of the interface and mean that visual graphics should support this, which in most instances of visualisation is inadequately set up [8]. Users with visual impairments, however, want to gain access to the expressive content that visualisations depict beyond an audio presentation. Research has therefore been conducted concerning tactile displays in accordance with data presented by The Braille Authority of North [7].

There are however present challenges in creating representations that are accessible. Expertise and engagement from both designers and accessibility communities are vital in order to reach this collaboration. Constant communication between the two

parties is critical to ensure that the relevant issues are brought up and solutions implemented as these communities represent users that are different from those designers usually aim their design towards [7].

Research regarding accessibility raises a number of challenges. First of all the number of participants is small and may find it difficult to travel. Meaning that researchers often have to compromise the selection of participants and location when conducting the study. The small number of participants can also create disproportionate results as it becomes a generalised view of the given issue. This means, simultaneously that a limited number of participants may be frequently asked to undertake research for the purpose of creating an accessible design [7].

Furthermore, there is a lack of knowledge from the researcher's perspective regarding accessible design. This may create a barrier to both conducting and publishing studies on accessibility as the valuable approach may be viewed as out of scope [7].

3.1.3 Benefits of Accessible Design

A study investigated whether the implementation of the Web accessibility guidelines would affect users with visual impairment more than individuals without them [9]. The evaluation was a remote website test with 110 participants where half of the users were with and the other half without visual impairments. The participants were assigned to a website with one of three accessibility levels achieved (very low, low, and high). The levels were achieved according to the Web Content Accessibility Guidelines 2.0. Factors such as performance, perceived usability, aesthetics, and user experience, as well as positive and negative affect, were measured. The result showed that higher conformance to the WCAG 2.0 might show improved benefits for users whether visually impaired or not [9].

3.1.4 Implemented Design for Visual Impairments

The implementation of design for visual impairments is a crucial aspect of creating inclusive and user-friendly digital products. This section, thereafter, explores key considerations and strategies of already created design solutions for users with visual impairments.

Haptic Feedback

Audio has become a useful alternative way of communicating information as text-to-speech software has improved [10]. Recently, there has also been a rise in haptic feedback, virtual environments and multimodal adaptations focusing on making technology such as touch screens accessible for individuals with visual impairment [11]. The research on multimodality and haptic perception has contributed to a broader knowledge of how sensory information that is non-visual is perceived[12]. There has also been substantial advancement regarding product reliability as well as effectiveness for aiding devices. Haptic perception allows object and pattern identification and recognition using a combination of signals from proprioceptors as

well as skin receptors[13]. Individuals with visual impairment classified as blind, rely mainly on haptic perception for processing spatial information and outer stimuli.

BrowseWithMe Online Assistant

An online assistant called BrowseWithMe was created in a study for individuals with visual impairment to facilitate shopping for clothes online through different websites[14]. It works by parsing and converting website content into a structure that can be accessible for users by commands or asking questions, for example, ”What is the price?”. The authors concluded that there were several advantages to give users the ability to actively solicit desired information, rather than letting visually impaired users become passive listeners of unparsed information as aiding devices usually work. Interviews and user studies revealed the benefits of browser assistants that are command-based, for instance, the effectiveness, consistency and increased trust and independence when users interact with features of different websites.

A common theme that has frequently occurred in prior works and studies is moving towards allowing users with visual impairment to approach web browsing in a more command-based and conversational approach. The ability to interact with interfaces using commands has shown promising modality for users with visual impairment, for example with the use of IPAs such as Siri and Alexa [15].

Screen Reader and Braille Display

Screen readers aim to provide access and control of computer systems to users who are visually impaired. By presenting the same information that is typically displayed on a screen through speech or on a refreshable Braille display, a user can still have access to the content [16].

A user who utilises a screen reader will control the computer through their keyboard and not their mouse. When using a computer, the use of a mouse is dependent on the user being able to see the mouse pointer and its location on the screen. Therefore, a user who can not see the screen must instead rely on controlling the computer entirely through the keyboard and keyboard shortcuts. A screen reader is therefore designed to follow the user’s focus and audibly present the information associated with that focus. In addition to speaking the text, the screen reader will provide cues about the type of element that is currently in focus [16].

It is essential to minimize the amount of speech used by the screen reader while providing the maximum information. Users often find the system frustrating when too much speech is given. The aim should therefore be to provide only the necessary information to help the user accomplish their task [16].

A Braille Display can be used in place of speech output for a screen reader. It compromises a line of refreshable Braille cells, usually between 20 to 80. Most Braille displays have eight dots, even though standard Braille cells have six dots to represent a character. The two additional dots are used to represent character

attributes such as capitalization and a cursor position. The set of pins required to represent a character is elevated to form the Braille character, while others are retracted. The Braille display typically presents a line of text, with the main focus located somewhere on the line and indicated by a flashing cursor, the bottom right dot rising and falling. This enables users to read through the text and navigate through it using the arrow keys or other keys on the keyboard, while also providing them with an alternative means of accessing information [16].

Determining what information a screen reader should convey to a user is not always straightforward. For instance, some screen readers announce every new window or form that appears on the screen. Although this may seem logical, it can result in a lot of unnecessary speech, especially for experienced users who are familiar with common forms of applications. This illustrates two different perspectives on what a screen reader should do: either provide a detailed description of what a sighted user sees or present an accessible interface that is tailored to the needs of the user. In practice, most screen readers incorporate both approaches, although some rely more heavily upon complex scripting to present the most relevant information to the user. Ultimately, the goal is to strike a balance between providing useful information and minimizing the amount of speech required to accomplish a task [16].

3.2 Guidelines

The guidelines are taken into consideration when creating the categorisation representation. The guidelines presented below have specific measurements of icons and buttons as well as design rules that will be useful when creating the prototype.

3.2.1 Human Interface Guidelines

The creation of user interface guidelines is to prepare the development of usable applications. The content of the guidelines may vary, some state general design principles, whereas others state intricate details in the interface. The behaviour of the interface may also be included and describes the recommendations for optimal usability [17].

Apple has developed guidelines for creating designs for mobile applications as well as macOS[18]. Their guidelines push the importance of understanding and designing for the iOS experience and offer advice on best practices to keep in mind when designing an app. Accounting for ergonomics and app interactions, the Apple guidelines also have a library of mobile components with descriptions of what it is, when it should be used and how it can look. For instance, buttons, menus and search fields are components from the guidelines that will be useful for the design created in this project[18].

3.2.2 Material Design Guidelines

Google has also created design guidelines that apply to a variety of platforms such as Android, iOS, Flutter, and the web. Their design system is called Material Design Guidelines[19]. The purpose of the Material Design Guidelines is to inspire designers to make their products unique while offering guidelines on how to make them functional for all users. There is also guidance regarding what patterns are suitable for each platform. The guidelines are built upon real-world examples of design and limitations by examining fictional apps with unique properties. Furthermore, they illustrate how labels brand themselves and the reasoning for numerous design choices[19].

3.2.3 WCAG

WCAG, which stands for Web Content Accessibility Guidelines, is created with the goal of providing a standard for web content that meets the need of individuals worldwide regarding accessibility [8]. The WCAG guidelines are developed in cooperation with international organizations and individuals through a W3C (The World Wide Web Consortium) process.

The guidelines explain how web content, such as text, images, sounds, code, or presentation can be created to become more accessible for people with disabilities. WCAG is intended for content developers, web authoring tool developers, Web accessibility evaluation tool developers, as well as others who are in need or want a standard for web accessibility [8]. WCAG has presented the requirements in order to reach AA-standard. Testable checklists are provided to the three conformance levels, with multiple criteria necessary to accomplish [20].

3.2.4 Design Principles

Depicted in Table 3.1 are the chosen design principles used to aid the designer when considering various aspects of their design and to aim it for the user experience [21]. Overall, these design principles are fundamental aspects to consider in order to create a pleasant design [22]. The principles are composed of a list of dos and don'ts and ensure that the required features are present in the interface. Some of the most widely recognized principles in user experience design pertain to how users interact with interactive products to accomplish their goals. These principles include visibility, feedback, constraints, consistency and affordance [21].

Reducing cognitive load and time of decision-making for users is critical in user experience design. Design principles should aid designers in enhancing usability and appearance, shaping perceptions, educating users and decisions in design throughout their projects. To apply design principles effectively in UX design, it is vital to have an understanding of user problems and an intuition of how users will respond to certain solutions. While the design principles provide guidelines for improving several aspects of a design, they should not be followed blindly. The designer must ultimately adapt the principles to each case and build a solid user experience by

addressing users' needs over time [22].

Design Principles	
Affordances	Design interfaces that suggest how they should be used by a user.
Consistency	Maintain consistency in design to make it easier for users to learn and use the interface.
Learnability	Ensure that your design is easy to learn, and users can achieve their goals
Hierarchy	Elements are arranged in order of importance
Visibility	Make it easy for users to see and find the elements they need to interact with.
Constraints	Use constraints to guide users and limit their actions to only the necessary ones.
Mental Models	Design interfaces that align with the user's mental models and expectations.
Emphasis	A design technique to highlight a specific element by making it visually distinct from other elements.
Flexibility & Efficiency	Design interfaces that allow users to accomplish tasks quickly and efficiently, with shortcuts and customization options.

Table 3.1: Design Principles [22]

3.3 Information Architecture

Information architecture or IA is used to solve problems regarding accessing, organising and using a vast amount of information in digital products [23]. The architecture is used, furthermore, to enable a flow that allows users to easily navigate between screens and modes [24]. Information architecture plays a vital role in representing valuable content in an accessible manner in order to save the user time in navigation. Most users want their information as quickly as possible with minimum effort, and if that information representation is too complicated, there is a risk that the user will abandon their search [24]. IA utilises components of cognitive psychology to organise the information such as gestalt principles, mental models and cognitive load. Users often participate in card sorting tests in order to gain insight into their

mental models of how the users would categorise information into groups [24].

Critics might state that users do not care about information architecture, as the users are not interested in how an interface is structured and is solely concerned with how quickly they can reach their goal. Contrary sources however mean that it is this aspect that makes information architecture so important in design [25]. The disregard for the structure of a website from a user perspective creates an even larger barrier between them and their goal. If they had more knowledge of an illogical structure they could utilise that knowledge and in turn, improve their navigation skills. Since that knowledge is not a given, IA needs to be implemented in order to allow users to focus on their given task and not worry about the structure of the web page [25].

The field of information architecture is still changing and constantly rediscovering itself[26]. There are not many well-established theories that drive the design of structures for websites. Information architecture has not been standardised, and the continuous demands on the field making progress makes that a challenging goal. A theoretical framework would have a set of principles which are based on universal truths and illustrates how to make information architecture good. Furthermore, while there is no standard theory in the industry, there are some principles that information architects consider when making design decisions[26]. Below are some principles relevant for this thesis.

3.3.1 The Principle of Disclosure

The principle of disclosure refers to the notion of only showing enough information to help users understand what kind of information they will find as they explore further [26]. The principle comes from progressive disclosure, a common design concept that is founded on the conception that there is a limit to how much information people can process at once. Additionally, the information that is processed can be used to predict what is to come. Sources furthermore state that presenting information to someone who is not interested nor ready to receive it can be ineffective and may be perceived as irrelevant or distracting noise [27].

When incorporating progressive disclosure in design, the content can be thought of in terms of layers. Different layers of the same content are displayed in different areas of the website. For instance, a recipe website can not display the whole recipe for every recipe on each page. Instead, the recipes could be divided into categories where less information is shown about the recipe. However, the right information is shown so the user knows what to expect when clicking further[26].

3.3.2 The Principle of Exemplars

The principle of exemplars refers to describing the contents of categories by showing examples of the contents[26]. Studies within cognitive science have long been made to investigate how people categorize things. What it means to carry a concept in the human brain has been examined and ultimately, psychologists have found that

categories are represented in the brain as networks of adequate examples. When a category name is displayed, provide a few examples of what content the category includes. For instance, when designing a list of main categories, adjacent to each category a list of a few items that represent that category can appear to provide context to the user[26].

3.3.3 The Principle of Multiple Classification

The principle of multiple classification relates to offering users various classification methods to browse the content website[26]. The principle is founded on the concept that good information architecture recognises that there are different ways users look for information. A small user group can have diverse motivations and mental models. To attempt to create simple ways to find information that accommodates several users, a classification system can be used. A classification system defines what labels will be used to categorize the content. The principle of multiple classification is a double-edged sword since providing multiple methods to find content is beneficial for users. However, providing too many ways to find content can risk overwhelming and distracting the user[26].

3.3.4 The Principle of Growth

According to the principle of growth, you should assume that the content you have today is a fraction of the content you will have tomorrow[26]. It is a self-evident but also confounding principle that refers to designing a structure that is capable of accommodating an increased amount of content. It would be difficult to present new additional content if the information structure is designed to handle the present amount only. However, a website can grow in many ways, such as by adding more content to existing categories or creating new categories. By anticipating what kind of growth the website might go through, it facilitates creating navigation that can accommodate it. For instance, a navigation system that handles topics can establish top-level categories and can be further developed to support new sub-categories[26].

3.4 Categories and Categorisation

Categorisation refers to the human experience of placing sensory information into separate groups. The categorisation can furthermore be divided into two processes, supervised and unsupervised. The former involves categorizing new sensory information into pre-defined groups, whereas the latter concerns the spontaneous creation of concepts and categories. In a controlled setting, this can manifest as the classification of objects into specific categories. The main objective of unsupervised categorization is to understand why certain classifications are preferred over others [28].

According to research on taxonomic hierarchies, categories in the middle level of the hierarchy tend to exhibit high levels of within-category similarity and low levels of between-category similarity. This pattern is thought to arise because these categories

are highly differentiated, meaning that they contain many psychologically relevant differences between members. In contrast, subordinate categories tend to have low levels of between-category similarity because they contain few shared characteristics. Meanwhile, basic-level categories are characterized by a balance between within-category similarity and between-category similarity, making them the most natural and intuitive level of categorisation [29].

When creating categories, it is important to consider the categorisation process, which can be both supervised and unsupervised. To ensure that the created categories are intuitive and natural for users, conducting user research is crucial. Additionally, the concept of taxonomical hierarchies can be applied to the creation of new categories for Benify by ensuring that basic-level categories are prioritised.

3.4.1 Basic-Level Categories

Donna Spencer explains in her book Card Sorting: Designing Usable Categories that when organising content into categories, its helpful to think about how the human mind interprets them [30]. According to Spencer, there is a perception of how categories work called the classical view, which is popular in Western culture. According to the classical view, categories are mutually exclusive, collectively exhausted, and clearly defined, and suggest that all levels of a hierarchy are equal. However, cognitive research shows that this is not true, there are basic-level categories that are learned earliest, have a short name and most people can recall them quickly [30].

The concept of basic-level categories suggests that categories are not only arranged in a hierarchy from general to specific but also that the most cognitively basic categories are placed in the middle of this hierarchy. This means that generalization moves upwards from the basic level and specification moves downward [31].

In the process of categorizing the world around us, humans tend to make determinations that are not arbitrary, but rather, highly influenced by a few key factors. Taxonomies, or classifications, of concrete objects, tend to have one level of abstraction at which the most basic categories are defined. The level of abstraction within a taxonomy refers to a particular level of intuitiveness. These basic level categories are those that carry the most information, possess the highest validity for categorisation cues and are the most distinct from one another. Sources demonstrate that basic categories are the most inclusive categories whose members share common attributes or shapes [32]. For example, grouping clothing together into their most basic level categories would manifest as shirts, pants and shoes, which is more intuitive than using overly specific subcategories like turtlenecks, bell bottoms and loafers. By using basic-level categories, users can quickly locate the information they need and navigate the interface.

Based on these principles discussed, when creating new categories and subcategories for the benefit and deals of Benify, it is important to consider the cognitive processes involved in categorisation. Specifically, the main categories and subcategories should

be organised in a manner that makes sense to the user and follows the principle of basic-level categories, which states that the most basic categories are those that carry the most information and are most differentiated from one another.

4

Related Work

In this section, we will review relevant literature on navigational structures in user interfaces and examine three different platforms that exemplify diverse navigational styles.

4.1 Navigational Structures In User Interfaces

Navigation style can influence the users' satisfaction regarding web interaction. Therefore it is important that sites are structured so that finding information can be done effortlessly and with navigation that can be understood intuitively. A study was made to investigate user preference regarding menu layout, such as placement of navigation links [33]. The study showed results regarding which styles users tend to learn and use easily. The participants got to view two examples from a given list of how each of the styles would be used in real life after viewing the sample site created for the study.

The theory that there are certain styles of navigation that are more suitable for accessibility was also tested. The expectation based on existing literature was that the navigation style with the highest rate of preference would be left-hand menus[34]. However, the study result revealed that tabbed style navigation was preferred among the test users. The motivation for this result was not very distinct from the user comments but was most likely because of how easy it is to understand and learn. The navigation styles that followed in order of ranking were: Top navigation bar, Combination top and Left navigation bars, and Left navigation bar. The users reported through comments and indicated in their scores that top and bottom navigation, as well as top and right navigation, was disliked. There were comments explaining how bottom navigation buttons were difficult to find and right-hand navigation felt awkward [33].

4.2 Three Examples of Navigational Structures

This section will present three various examples of platforms that utilise a varied style and structure of navigation. The three platforms are used as benchmarks for the redesign of category representation on Benify, for their unique reasons. Amazon

is included since the platform has created a navigational structure for searching through extensive amounts of products. However, the navigation can be perceived as difficult and not accessible. Mecenat is similar to Benify through their various offers and deals and their navigational structure is therefore relevant to this thesis. SVT Play, in contrast to Amazon, is an example of an accessible platform that consists of easy navigation for users with visual impairments.

4.2.1 Amazon

Amazon is known for its vast amount of products and categories [35]. The web page is built around categories and offers several alternatives for users to navigate amongst them. There is a top app bar navigation at the top of the page [36]. A search field is located at the center of the top app bar where, inside the search field, users can select a given category from a drop-down menu and narrow down their search [37]. The second form of navigation is the tabs below the top app bar [38]. The tabs hold content that is distinct from the rest and is an alternative for users who want to browse in the categories without having a target in mind. A hamburger menu button on the far left opens a modal navigation drawer to all available categories as well as other links to information regarding the company [39]. When selecting a category the user is presented with a list of subcategories [40]. When the user has chosen a category or a subcategory, they are taken to a new page where another tab module displays the other subcategories. The user is then presented with a list of products within the chosen category.

There is a standard navigation drawer on the left side of the screen where the user can see the category hierarchy and navigate amongst them. Below the categories, there are several filters that can be applied to facilitate the user finding what they want. Most of the filters are designed using checkboxes so that the user can choose multiple options [41]. Amazon is a platform that allows different sellers and business to sell their products, meaning that the information architecture has to support navigating among content that is constantly increasing and changing (see Figure 4.1).

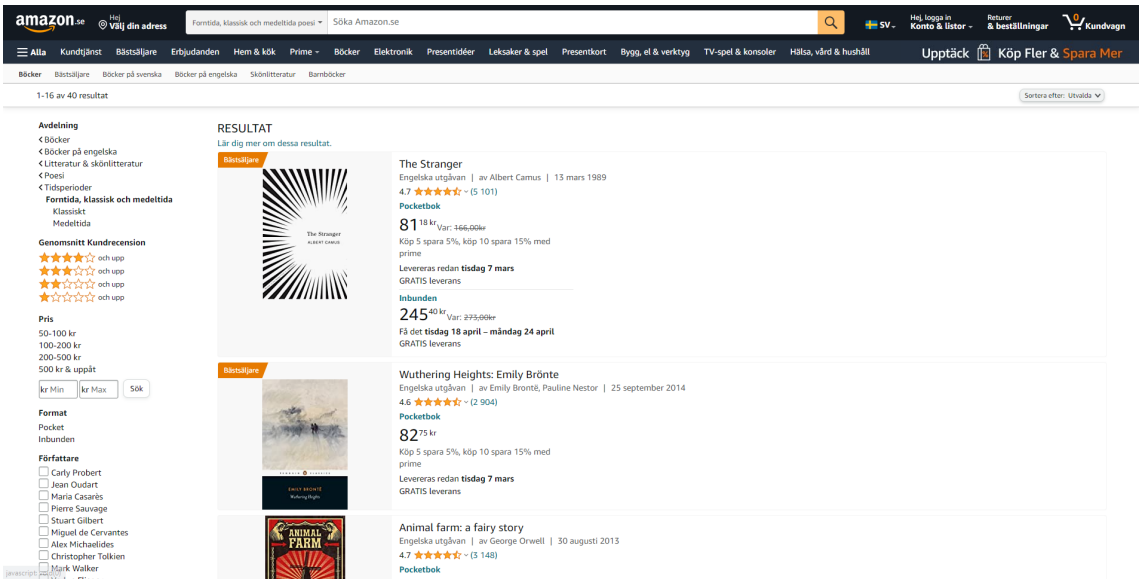

Figure 4.1: Amazon category navigation

4.2.2 Mecenat

Mecenat AB is a digital service which provides deals and discounts for Swedish students [42]. The discounts can be accessed through the Mecenat website or mobile app. The website utilises top app bar navigation to display relevant information such as campaigns, competitions and student discounts [36]. There is also a search bar which the user can use for alternative navigation to a specific discount[37]. The student discounts option is paired with a hamburger menu icon and unfolds a drop-down menu when clicked on [1]. The left side of the dropdown menu contains a list of categories which when hovered on displays a list of the corresponding subcategories beside it (see Figure 4.2)[40].

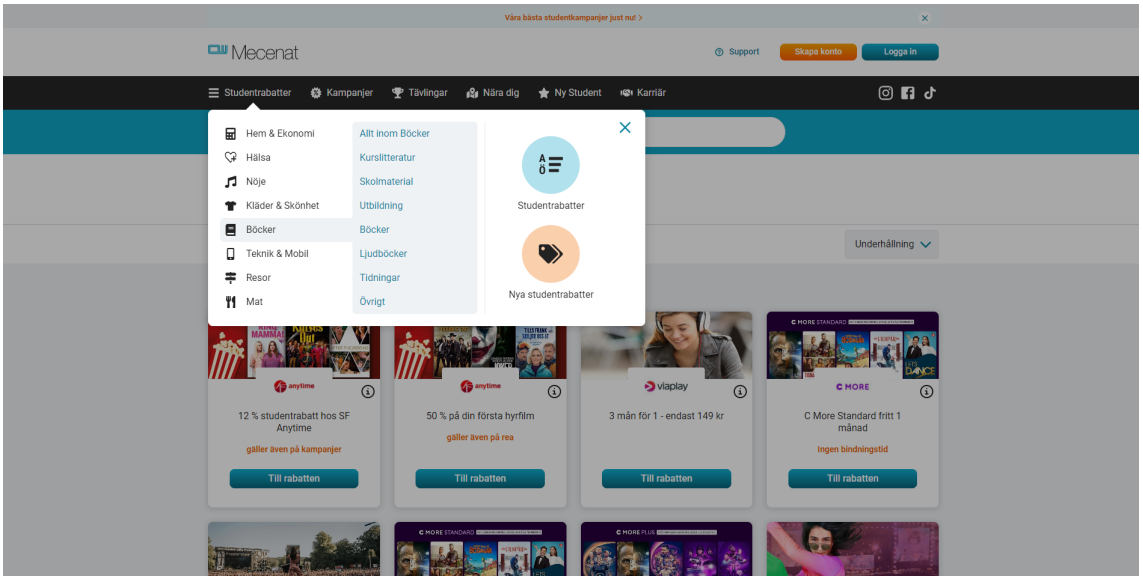

Figure 4.2: Mecenat top down navigation

To the far right, there are two images which lead to all discounts in alphabetical order as well as new discounts. When choosing a category, the user is brought to a new page where the discounts within the category are presented (see Figure 4.3). The discounts are organised using headers with a corresponding carousel presenting the discounts within that subcategory [43]. At the bottom of the carousel, there is a progress indicator which indicates how much of the carousel the user has seen[44].

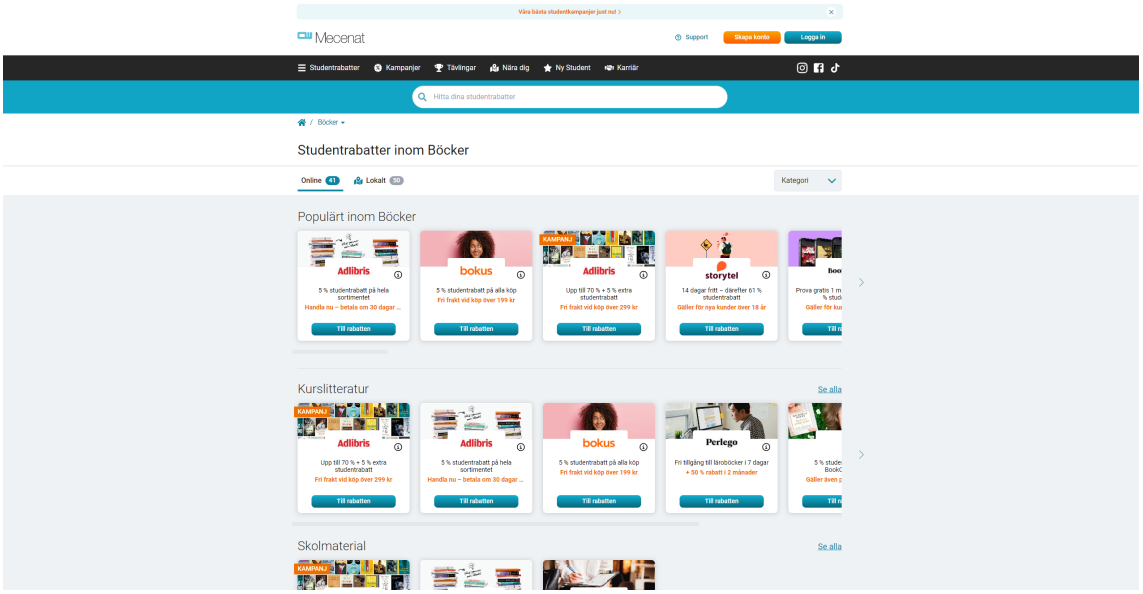

Figure 4.3: Mecenat category navigation

The discounts are presented as cards containing an image, company logo and brief information about the discount as well as a "Go to discount" button [45]. If the user clicks on the button they are brought to a separate page with all information about the discount as well as the discount code. The user can also click on the card itself to get a pop-up presenting more in-depth information and links to terms, the company or report a problem. The same "Go to discount" button is present on the pop-up so that the user can easily compare discounts using the pop-up information and then proceed to the discount of their choice. If a subcategory is chosen in the dropdown menu or by using the "see all" link beside the carousel, the user will be brought to a new page where the discounts are presented as a list of the discount cards.

4.2.3 SVT Play

SVT Play is a video streaming service owned by the Swedish national public television broadcaster (SVT). The service is funded by a public service tax on citizens' income, which is set by the federal parliament. SVT has stated that it is important for them to make the service as accessible as possible for all their users. To achieve this, they have worked with a company that works with accessibility and follows the guidelines presented by WCAG [46].

On the website, there are fixed tabs which are used for lateral navigation between

the content of the same hierarchy, which in this case are the start page, programs and channels [38]. The start page contains new and popular content, which is communicated by the size of the featured content. The programs are also structured into different categories using headers with a corresponding carousel displaying the related content, which can be seen in Figure 4.4. The structure is similar to the one utilised by Mecenat and is used both on the start page and when choosing a category on the programs tab.

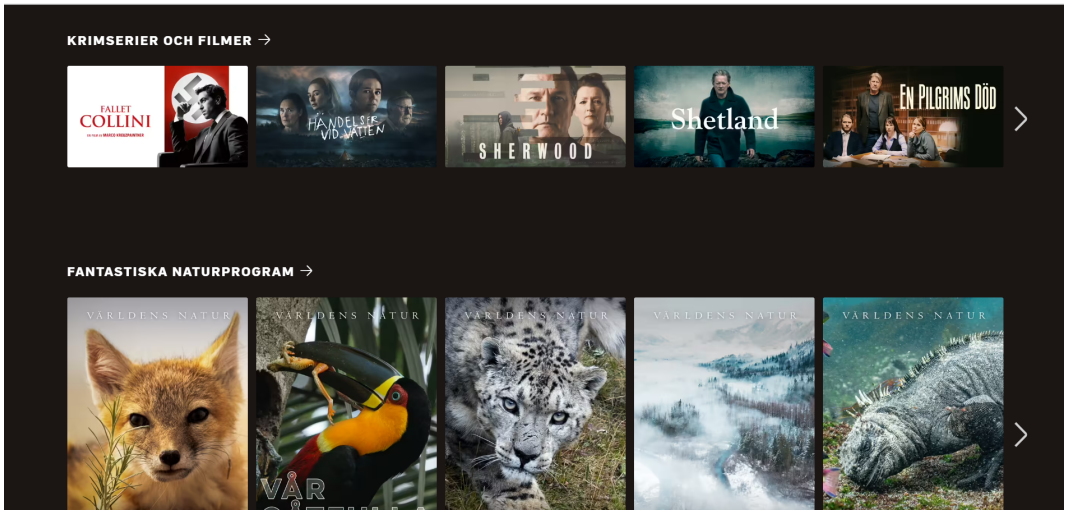

Figure 4.4: SVT Play interface

When entering the programs tab, the categories of programs available are displayed using background images representing the category (see Figure 4.5). To facilitate users with visual impairments, they use high contrast between background and text. For instance, the text is white against the black background and although the images are colourful, they have chosen darker nuances to keep the contrast high. Below the categories is a list of the alphabet, leading the user to a list of all programs that start with the chosen letter.

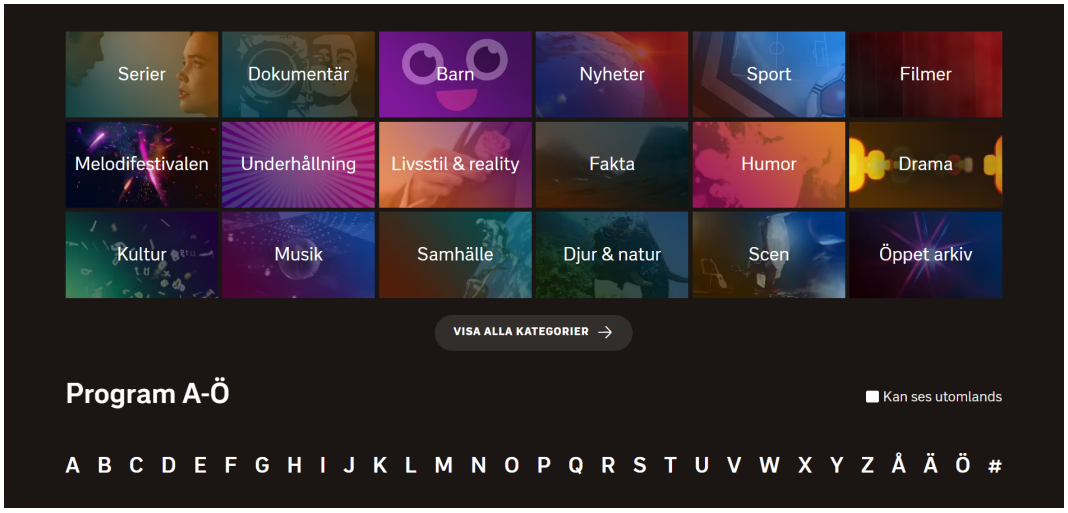

Figure 4.5: SVT Play category navigation

5

Methodology

This chapter presents relevant methods that will be utilised during the design process. All methods can be used in various contexts to achieve different goals, this section will afterwards explain the methods for this specific design process. A more in-depth explanation of the actual use will be given in Chapter 6 *Planning*

5.1 Design Process

Problems in design can be described as "wicked problems" and refers to the fact that it is impossible to completely solve due to the various needs, oppositions and incompleteness [47]. A level of uncertainty will always exist in the design process and in order to create a sufficient design, it is vital to understand user needs and technological possibilities. Furthermore, the design process requires a dynamic approach and to view it as static would be inaccurate [48].

5.1.1 Exploratory Research

Exploratory research aims to discover something novel within a chosen topic. There is no guarantee that exploratory research will lead to anything new, however, it is this form of research that allows sciences to evolve and not repeat what is already known [49].

5.1.2 Literature Review

A literature review is used to answer practical or theoretical questions in the context of existing related work. There are two main contexts for utilising literature research, firstly with the goal of gaining an understanding of the topic in the current academic environment and viewing existing literature. Secondly, a literature review can be beneficial in a research project to prove that the research question has not already been answered. In that instance, a review of literature is vital to put the research question in an academic context and depict what knowledge can be contributed [50].

5.1.3 The Double Diamond

The double diamond is a design process created by the British Design Council in order to guide researchers through the unclear design process and its problems [51]. The model described the creative process with four distinct stages *discover*, *define*, *develop* and *deliver*, as presented in Figure 5.1. This project will follow the process and notions described by the double diamond design process and the relevant methods. There are several other design processes that are commonly used in addition to the double diamond. Lean UX, Agile UX and Design Thinking are to name a few, the chosen design process should be applied depending on the needs and context of the work in question.

The first diamond in the double diamond design process promotes an exploration of the challenges and problems that have emerged through surveys or interviews with the people who are affected. The gathered data is later transformed into a problem statement. The second diamond focuses on solutions for the problem statement or creating a sufficient design that lives up to the requirements. The last step of the second diamond is about the creation of a design that will solve the discovered problem from the first diamond. The solution is then evaluated and iterated to reach the optimal final design [51].

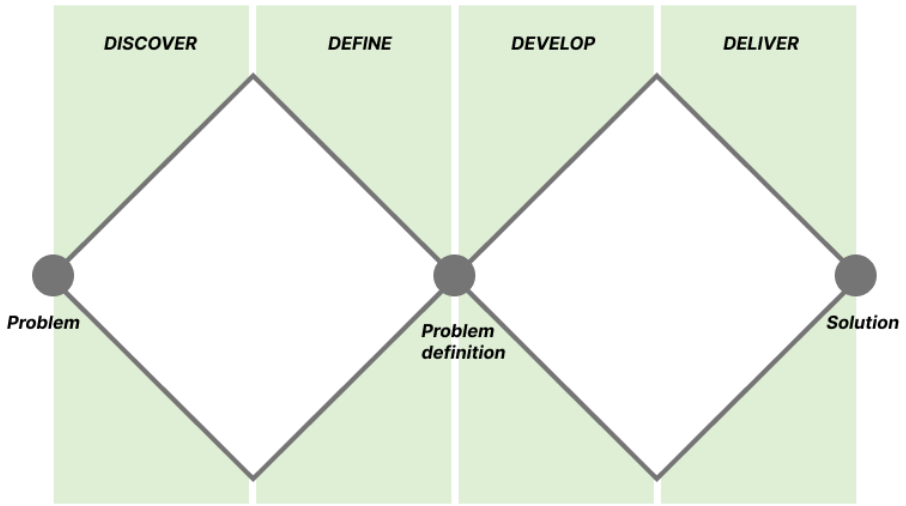

Figure 5.1: The Double Diamond Design Process

5.1.4 Discover

The first stage of the diamond is about discovering and understanding what the problem is. It surrounds the idea of communicating and being around the people who are affected by the problem and not simply assuming what it is regarding. The methods that belong to this phase are used to explore the problem and understand the user needs [51]. The methods featured below are used to understand the user's needs and aim to identify the existing problems in the categorisation representation.

Card Sort

Card sorting is a methodology used for research in UX where participants sort cards or labels according to criteria that feel logical. It is a method that allows for discovering users expectations and grouping content accordingly [24]. Commonly used for evaluation in Information Architecture, it is a practice that utilises users' input to find an effective structure of navigation. After the data has been collected the answers are interpreted and usable categories are created accordingly. Before the creation of final categories, anomalies in the data should be excluded as these could distort the results. Viewing these anomalies in a cluster is difficult and should therefore be removed from participant to participant. At the later stages, it is possible to view the useful categories by analysing the average amount of categories created by the respondents, how many cards are placed in these and if these have an organic relation [52].

Likert Scale Questionnaire

A Likert scale questionnaire is the most common method for gaining quantitative data on subjective experiences. A Likert scale is a measurement where respondents can rate their agreement, feelings or experiences regarding various subjects. The number of possible responses is limited and often ranges from "strongly disagree" to "strongly agree" with various available points between. It is recommended to embed a Likert scale questionnaire with another method in order to produce more nuanced data as numerical data seldom gives enough insight into constructs [53]. A related method is the semantic differential scale that utilises two polarising adjectives or phrases to understand and measure a participant's perception of a given topic.

Expert Interviews

The goal of conducting interviews is to gain empathy with the users' experience of the problem or product. In the context of UX design, this data gain aid in creating solutions that better meet the end users' requirements. User interviews can furthermore create a deeper understanding of how users engage with the product as is [54]. An expert interview is conducted by holding a semi-structured interview with a person who has expert knowledge in a certain area [55].

Semi-structured interviews (SSI) is an interview form that focuses on the participant's responses to create relevant probes. Participants answer predetermined open-ended questions regarding a specific theme, however, the questions are not set in a distinct order. The questions in an SSI are in response to the given answers and the interview can be tailored throughout [56].

Brainstorm

Brainstorming is a commonly used method for generating ideas or concepts. The method can furthermore be utilised to depict relationships between notions and visually represent knowledge. A subpart to brainstorming is brainstorming webs, which is used in the development of a central theme by recognizing related topics or facts

and their relation. Tree diagrams are, moreover, commonly used for brainstorming to depict the hierarchy between concepts and central themes. [57].

5.1.5 Define

The second stage is define, where the insights from the previous stage are structured and analysed to define the problem in another way. The information is integrated into a problem definition and prioritised depending on the context of the design and problem area [58]. These methods are utilised to structure the data gathered from the previous phase and depict the key notions of the problem statement.

Persona

Persona is a critical method for UX design. It is used to gain a deeper understanding of the user's needs and experience without unfitting generalizations. Persona utilises hypothetical archetypes of the actual users and their goals, lifestyle and interests. The method is used to counteract an imagined user that designers can mould to fit their end goal. This method however has some disadvantages as it is challenging to create personas that truly depict and define the users [59].

An alternative to this method is scenarios that explore the day-to-day usage of the product. The aim of the method is to understand how the product is used from the end users' point of view. The method is used to confidently create design ideas that benefit the user and empathically understand how the application will be used [57]. It has similar qualities to the persona method with its focus lying on gaining an empathetic understanding of the user experience.

User Journey Mapping

User journey mapping maps out users' interaction with the product or problem space [60]. It is a visual representation of the process a user has to accomplish in order to complete a goal or task. A user journey map starts by depicting a chain of user actions on a timeline, which will later include user thoughts and emotions. The majority of user journey maps comply with a compact format. According to the format presented by Nielsen Norman Group (2018), creating user journey maps consists of five key components [61].

Persona is the centre of a user journey map and is the one who experiences the journey. The map is told from their narrative and should depict one point of view per map. The next component is *scenario* and *expectations*, the situation brought forth by the journey map and is related to the persona's needs and expectations. *Journey phases* describe the high-level stages in the user journey and depict an organised perspective of the phases a user has to go through to reach their goal. These phases may vary depending on the company or scenario. *Actions, mindset* and *emotions* represent the behaviour, ideas and feelings the persona goes through in their journey, each of which is depicted within the various phases. Actions describe the steps a user takes during the phase, mindset corresponds to any questions, notions or needs

a user has and at last, emotions are visualised with a single line across the phases and depict the actual highs and lows in their journey. Finally *opportunities* are the lessons gathered from the map and discusses how the experience can be optimised [61].

User Flow Diagram

This method ensures that the design constantly keeps the users' needs in focus and does not solely focus on the information architecture. The creation of user flow charts starts with understanding various users' objectives and thereafter depicting how they reach them through the website. By understanding the user's journey, the user experience can be enhanced to further accommodate their needs and requirements [62].

Whereas user flow diagrams often utilise lines and shapes, the storyboard method is based on a more narrative form of storytelling. User flow diagrams offer a clear overview of the user journey, highlighting different branches and decision points. In contrast, storyboards provide a more engaging narrative approach, focusing on the user's actions and experiences. While user flow diagrams provide a comprehensive structure, storyboards bring the user journey to life through visuals and storytelling [63].

Affinity Diagram

The process of creating affinity diagrams consists of four distinct stages "creating notes, clustering notes, walking the wall and documentation" (Lucero, 2015) [64]. The creation of notes is a bottom-up process and the labelling of the groups will occur organically and not from predefined categories. The groups, or clusters, will thereafter be titles and the notes are placed accordingly. The latter steps of walking the wall and documentation are used to gain an overview of the clusters and catch potential anomalies, as well as transform the paper into digital data. The motive for creating an affinity diagram lies in contextual inquiry. By creating a pattern and structure from detailed and abstract data, an understanding can be developed and in turn, disclose novel notions [65].

While affinity diagrams are known for their structured and collaborative nature, mind maps take a more flexible and individualistic approach. Mind mapping involves organizing concepts around a central theme, offering a visual representation of information or ideas. Both methods aim to bring clarity to complex data or ideas and provide structured depictions of relations between concepts [66].

5.1.6 Develop

The first phase of the second diamond is develop, where possible solutions and designs for the problem statement are explored [51]. The first solutions are tested and iterated until the most suitable design is selected. This phase aims to find the optimal solution that will satisfy the user needs and requirements [58]. The methods

in this phase aim to visualise the data from the previous phases and create possible design solutions.

Crazy 8

Crazy 8 is a UX method that is utilised to create possible solutions by drawing eight different ideas in eight minutes. The purpose of this design sprint is to challenge the initially created ideas by generating a wider variety of solutions. Due to the short time limit, Crazy 8 often results in more non-stereotypical ideas that push the limits of the designer's initial thoughts and ideas of which solutions are probable [67].

Sketching

Paper and pencil sketching is a form of low-fidelity prototypes and is a method to produce new ideas and support the design thinking process. The creation of simple hand-drawn sketches acts as a catalyst for novel ideas with a focus on the design process. The method is furthermore valuable in order to communicate the ideas to the team and stakeholders [68]. The aim of sketching is not to produce high-quality pictures but rather to represent the ideas and design [21].

Tree Testing

Tree testing may be used as a follow-up to the card sort method to evaluate the suggested label of categories. The tree is developed based on the data gathered from the card sort and results in a proposed hierarchical structure. The different items are placed in their main category and then divided into possible subcategories. This tree is then evaluated by users to understand if the categories are logically structured. The users receive a task to find a specific item within the category structures and the data is then analysed to find points for improvement [69].

Mock-Ups

In contrast to prototypes that are used to test and validate functional ideas, mock-ups are focused on non-functional ideas with the user experience requirements in mind. Mock-ups can be used in different stages of the design process and result in low-fidelity prototypes to communicate early ideas of possible design solutions or more developed ideas for usability testing [70].

Prototyping

The form of a prototype can range from a piece of paper to complex software wire-frames. They are useful communication devices for stakeholders and users to evaluate the design. Prototypes furthermore allow for an understanding of what is feasible or unclear in the design and will later influence the final design. A low-fidelity prototype differs from the final design and lacks the same functionalities. It is often created with paper, in contrast to a screen-based wireframe, and is used to represent the functionalities of the end product but lacks the actual performance of these. Low-fidelity prototypes are quickly assembled and are cheap to produce,

they are useful in the early stages of the design phase as they can be easily modified. High-fidelity prototypes on the other hand resemble the final product and are more functional than the previously created low-fidelity prototypes. These prototypes are used to test the functionalities of the design rather than the concept and are often more developed in order to communicate the design of the final product. [21].

5.1.7 Deliver

The final phase narrows down the potential design solutions that were previously created. If the design does not work it will be rejected, or if a design shows potential it will be improved [51]. Testing plays a crucial role in this phase to ensure that the chosen solution effectively addresses the intended goals. This phase will then be looped until the optimal solution has been secured [58]. The methods in this phase are used to ensure the best possible design solution by gaining data from users and testing the categorisation representation.

Usability Testing

Usability testing is a method to gather empirical data on how to improve the user experience. The method evaluates how a user walks through the digital application when given a task to understand their experience thereafter. Areas for improvement can thereafter be identified based on the users' behaviour, where they got stuck in a task or experienced feelings of confusion. The method follows the think-aloud technique and during the procedure, error detection often follows if a user takes an abnormal amount of time to complete the task, has to rethink their approach, gave up on the task or if they completed a different task than the specified. [57].

Usability testing is often a combination of various methods such as observations, questionnaires and interviews in a controlled setting. The same instructions and conditions are presented to each participant in order to eliminate possible confounding elements. Usability testing can furthermore be used to compare two different interfaces and test which is superior to the other. The same rules for the controlled experiment still apply, the only factor that is different is the interface type. The data would then be analysed to decide if the participants scored differently when carrying out the tasks and which interface can be determined to be the better one [21].

Think-Aloud Technique

The think-aloud technique is often combined with observations to gain a deeper understanding of what the participants are doing and what they are thinking. The technique asks participants to speak their entire thought process out loud when trying to complete a task [21].

The chosen evaluated heuristics can vary depending on the end goal but it is recommended to have between five and ten requirements. Furthermore, the number of evaluators varies depending on the stage of the design process. Early onset design

can be evaluated by one or two people, whereas the in the final design a team is advisable [21].

Thematic Analysis

The thematic analysis provides a framework for analysing user interviews. A proper analysis will reduce the risk of biased interpretation of the answers and ensure a systematic walkthrough of the data. A thematic analysis aims to identify themes or patterns from the interviews and contains six distinct steps.

Familiarization is the first step and seeks to create a general understanding of the data. When going through the interviews early patterns can be identified and ideas for possible codes to describe the content [71].

The second step is *generating initial codes*, which is a short account of what is being said in the interview. The name of the code is dependent on what the data is regarding and can be short descriptions of the content or describing keywords. When the entire interview has been coded, the data is organised based on the assigned code. The aim of this step is thereafter to organise the data into a meaningful group [71].

Developing themes are an interpretation of the codes and are a broader description of the findings from the previous step. Two related codes with similar content may be placed together to create a theme [71].

The fourth step is *reviewing themes* where the themes are revised and reviewed. The section of the interview related to the codes is analysed to understand if the content agrees, contradicts or overlaps the theme. The end goal is to create themes that are coherent and consist of data that are meaningful but distinct from each other [71].

Defining and naming themes consists of naming the created themes with descriptive keywords. The name should not only be describing what the theme is about, but rather what the essence is and why it is valuable. This step is an iterative process, and if the names do not give any indication of the content of the theme and are too complex to name it is advised to return to the previous step [71].

The final stage is *producing a report* which results in a summary of the findings and a disclosure of how the data was gathered.

Heuristic Evaluation

A heuristic evaluation utilises a predetermined list of usability rules to determine errors or areas of improvement in the application. The method is used to ensure that the design is not based on intuition, but instead on predetermined rules that are to be fulfilled. Heuristic evaluations can be used on low-fidelity prototypes to identify usability problems in the design before the end user is introduced [57]. The evaluation takes place without the involvement of users and the researcher has to model or interpret how a user would interact with this design. The evaluation is

based on knowledge about the user and their probable interactions. A walkthrough can then commence which entails going through a given scenario and answering questions about a prototype [21].

The principles, or heuristics, used for the walkthrough can depict if the elements in the user interface conform to established principles. The heuristics allows for a consistent design that reduced memory load and uses easily understood terms in the design [72]. There are several heuristics that can be considered, this thesis however will focus on ten specific ones derived by Interaction design and user advocate Nielsen [72]. The ten most important heuristics according to the author are *visibility of system status, match between system and the real world, user control and freedom, consistency and standards, error prevention, recognition rather than recall, flexibility and efficiency of use, aesthetic and minimalistic design, help users recognize, diagnose and recover from errors and help and documentation*[72].

The list of heuristics is used by comparing an aspect of the design against them. After going through the interface multiple times and comparing various components to the list, usability problems will be identified and the design can be iterated until there are none left. Nielsen states however that when evaluating a specific product such as a mobile application, the list of heuristics can be tailored and adapted based on market research of other documents of requirements [21].

6

Planning

The process of this thesis consisted of four phases *discover*, *define*, *develop* and *deliver* [51]. The planned approach will be elaborated on in this section as well as the relevant methods and their implementation in each phase (see Figure 6.1).

6.1 Discover

The purpose of the first phase is to understand the problem. An initial problem statement was defined by Benify and a *literature review* will therefore be conducted to gain an understanding of the theoretical background. The research question aims to explore the design of a categorization representation based on user expectations. To gather insights, a survey including a *card sort* was distributed to participants. The purpose of this method is to understand how users would group the benefits and deals. The survey with the card sort will furthermore include a *Likert scale questionnaire* to understand how users experience the current information architecture. A criterion from Benify was to create an accessible website that achieves WCAG AA-level. An *expert interview* will therefore take place with a representative from the Swedish Association of the Visually Impaired (SRF) to gain empathy and understanding of the problems when navigating a website when visually impaired.

6.2 Define

The second stage aims to define the scope of the problem and what aspects are most vital for the remainder of the thesis. An *affinity diagram* will be created from the responses of the card sort and give insight into the different clusters of possible categories. This method is used to sort the raw data from the card sort and visualise the most common categories and their associated title. Three *personas* will thereafter be created to understand how various users navigate through the interface and what issues may arise. The method can give way for further insight into the user experience on the Benify website. *User journey mapping* will be based on the persona and illuminate the emotions and mindset the user may have when trying to achieve their intended goal. At last, a *user flow diagram* is planned from the persona and depicted the various sites a user had to visit to find their intended benefit or deal.

6.3 Develop

After gaining a greater understanding of what the main problems are, the next phase will be to create *sketches* of possible design solutions. A *crazy 8* will be conducted for generating ideas and later transformed into *mock-ups* and *low-fidelity prototypes*. The prototypes are first created on pen and paper and later adapted in Figma and transformed to more elaborated *high-fidelity prototypes*. In order to ensure an accessible interface, a *WCAG test* will be performed on the high-fidelity prototypes, with the goal to achieve AA-standard. *Tree testing* will thereafter be created and, based on the data from the card sort, propose a possible hierarchical structure of the benefits and deals.

6.4 Deliver

Usability testing will be conducted with the high-fidelity prototype to understand the user experience and their thought process while navigating the interface. The *think-aloud technique* will furthermore be incorporated in the usability test to give insight into how they completed the given task. At the end of the usability test, a short *semi-structured interview* will take place and allow the participants to give a more detailed explanation of their user experience and possible usability problems. From these answers, a *thematic analysis* will take place as a method to systematically analyse the interviews and usability tests. At last, a *heuristic evaluation* will be performed to understand the usability of the interface. The prototype will be iterated after conducting the usability tests, in order to solve usability errors within the given time frame. Proposed design solutions will otherwise be presented as prompts for future work.

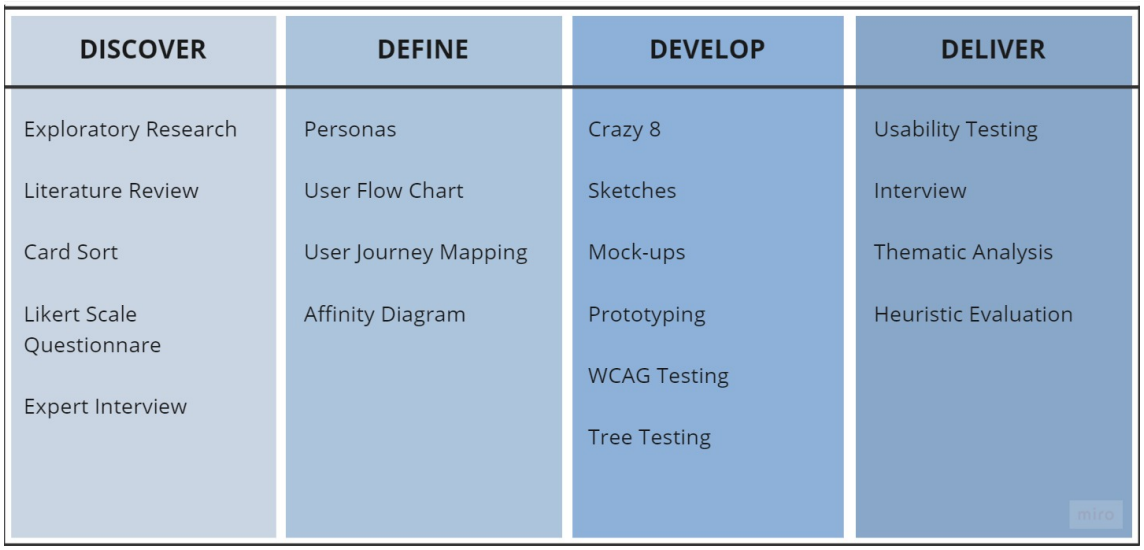

Figure 6.1: Methods that will be conducted for this thesis.

7

Execution and Process

This chapter offers an explanation of how the double diamond design process was utilised during this project. A description of how each of the methods used for this process was executed will be provided for each design phase. The process is divided into what in this chapter is referred to as design iterations. A design iteration in this case might differ from the usual denotation. In this chapter, an iteration is when the design is further improved on a larger scale and developed, often to a higher fidelity even though the design itself might not have been tested by users before iterating.

7.1 Preliminary Study

Prior to commencing the discover and define stages of the design process, exploratory research and a thorough literature review were conducted. These preliminary steps involved gaining insights and knowledge in the relevant field. In the discover phase, methods such as card sorting and interviews were employed to collect user input. Subsequently, in the define phase, personas, user journey mapping, user flow analysis, and an affinity diagram were utilized to inform and guide the design decisions effectively

7.1.1 Exploratory Research

The benefits available on the Benify platform can not be accessed without an account, meaning that the website and mobile application had to be explored for the first time at the start of this project when accounts could be provided by Benify. Navigating the website as first-time users gave insight into how users are introduced to the website and which elements might cause confusion. The exploratory research revealed inconsistencies in how categories were structured and differences in where benefits are sorted depending on the end-users employee account.

7.1.2 Literature Review

A literature review was conducted to gain knowledge of previous research regarding this project's subject. Topics such as information architecture, how to design for and structure categories, and research on visual impairments and accessibility were included. The literature review was performed by reading relevant literature, learning

about areas of interest and evaluating valuable sources for this project (Appendix A).

7.1.3 Discover

This section concerns methods applied during the discover phase, which is about understanding the problem at hand. It builds on utilizing methods to communicate with people concerned by the problem rather than assuming how the problem is experienced. The methods explained below are the ones used during this project to understand user needs and identify existing problems in the current representation of the categories.

Card Sort

To gain insight and understand people's mental models and expectations regarding how benefits could be sorted into categories, an open card sort was conducted. The card sort was created and shared using the software Maze [73]. The card sort consisted of 34 benefits and deals that fall under 10 different categories from Benify's platforms. The chosen benefits were selected from three randomly chosen companies that use Benify. The users grouped the benefits and deals together into new categories with suitable names. The respondents were both users of the Benify platform and non-users, aiming to get both user experiences and avoid possible bias. The card sort gathered 34 respondents and yielded a greater overview of their mental models for the placement of the various benefits. The table featured describes the majority placement for the benefits according to the respondents compared to their current placement (Appendix B). This data allowed for a reorganisation of the benefits and created a benchmark for similar benefits and their possible placement. The new placement of the benefits was visualised and new categories could be created (see Figure 7.1).

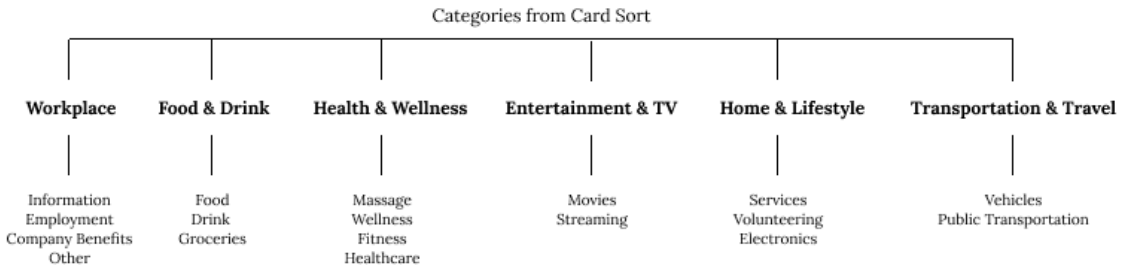

Figure 7.1: New categories based on the card sort.

Likert Scale Questionnaire

A Likert scale was embedded in the card sort and was used to understand the subjective experience of using the navigation for finding benefits structured into categories on Benify's platform. Before beginning the survey, a control question was implemented regarding if a respondent has previously used Benify. If a respondent had not used Benify previously they were directed to the card sort. If they have used the platform previously, a Likert scale with three prompts and two follow-up questions was presented before they could participate in the card sorting. The Likert scale consisted of six points and ranged from "strongly disagree" to "strongly agree". The presented prompts were *"I can navigate through the categories, "I can find the benefit or deal that I am searching for"* and *"I am satisfied with how the categories are structured"*.

If a respondent chose to answer between points one and three - the lowest ratings - on the final question they were directed to the follow-up question *"What would you like to change?"*. This was implemented in order to allow for a deeper discussion regarding the usability problems that a respondent may have perceived. Furthermore, if a respondent chose points four to six they skipped the previous questions and were instead presented with *"Do you have any other thoughts or feedback regarding how the categories are organised?"*. They were then allowed to participate in the card sorting.

Out of the 34 respondents on the card sort, 20 were previously directed to the Likert scale questionnaire and answered the three stated prompts. The first prompt *"I can navigate through the categories"* received distributed results with an average point of 4.3. 14 respondents chose to place their points higher than three, whereas six respondents chose three points or below (see Figure 7.2). These results can indicate an agreement with the prompt and depict that Benify users are in some manner able to navigate through the current categories.

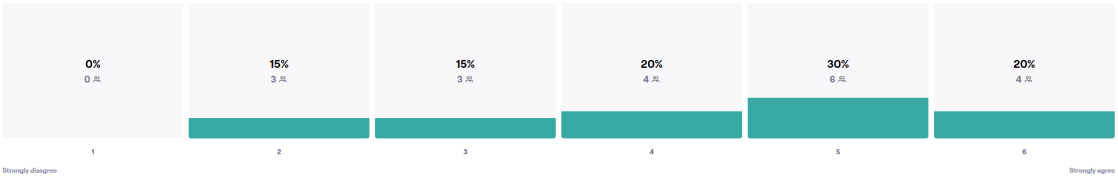

Figure 7.2: Distribution of points for "I can navigate through the categories".

The second prompt *"I can find the benefit or deal that I am searching for"* also gained 4.3 points on average. The distribution of points is similar to the previous prompt, with the majority of respondents choosing points higher than three (see Figure 7.3). This indicated that users are able to find their benefits of choice, however, says very little of the ease of doing so. This is brought forth by the third prompt *"I am satisfied with how the categories are structured"*, where the average points were merely 3.4. The majority of respondents choose three points or below in this instance and shows that even though Benify users are able to find their benefit or deal, they are not as satisfied with the structure (see Figure 7.4).

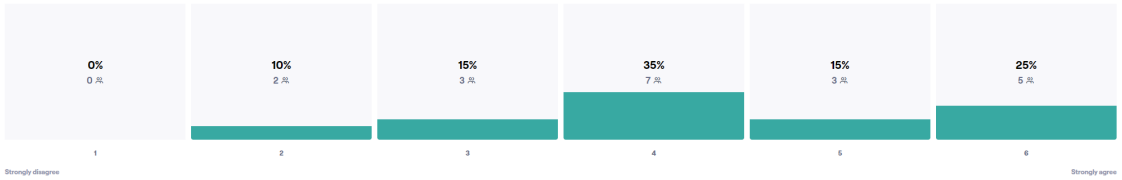

Figure 7.3: Distribution of points for "I can find the benefit or deal that I am searching for".

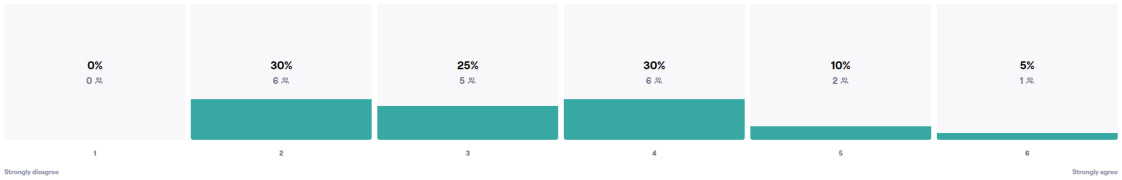

Figure 7.4: Distribution of points for "I am satisfied with how the categories are structured".

Expert Interview

An expert interview was conducted with a representative from SRF who is visually impaired. The interview was conducted via Microsoft Teams and lasted for 60 minutes. Before the interview started verbal consent was given regarding recording the interview and using the data for the purpose of the thesis. The semi-structured interview aimed to understand navigation through an interface when visually impaired and what challenges and opportunities exist. The questions were moreover centered around navigation in a menu structure with a screen reader and how the composition of various items should be arranged to facilitate navigation with assistive technology. A demo of a screen reader was also provided with a walk-through of its functionalities and limits. Although the main focus of the thesis is to create a new information architecture based on user expectations, it is still valuable to create an accessible interface. The interview was thereafter performed to ensure a sufficient level of accessibility for users who are visually impaired and use screen readers or refreshable braille displays as their main form of navigation.

The expert interview revealed that navigation when visually impaired varies from individual to individual. The common problem in accessible navigation is to allow users to gain an overview of the platform without relying on sight. A common way for users with visual impairments to navigate a platform is with a screen reader and keyboard shortcuts. The user navigates with the tab key to move across menus and icons while a voice reads aloud the item in focus. The expert furthermore stated how landmark navigation can facilitate navigation with a screen reader. In this instance, the screen is divided into certain areas where the user can shift between. If a user wants to leave or enter a certain area, they can use a command on the keyboard. However, this area lacks a lot of research, according to the expert, and rarely works on a website. The concept of landmark navigation is thereafter taken into consideration in the prototypes for this thesis. Even though it will not be possible to create the prototype with actual code, the design is based on an iteration

where this can and should be implemented.

A common issue when navigating through information architecture when a user is visually impaired, are pictures that do not link to an alternative text. This means that when a user has selected an image, the screen reader can not read its content which leads to the user becoming excluded. Notifications for conversations are another issue, according to the expert, platforms do not give an indication for screen readers when an alert has been sent out. A user with a screen reader will therefore have to manually enter the chat to notice that a new message has been sent. The expert stated that in order to solve these mentioned issues it is vital to keep accessibility in mind in the design stages and not leave it to the coding phase. Landmark navigation, for instance, occurs in the design phase and should not be totally reliant on the code. Another presented issue, that should be addressed is how to efficiently include users with visual impairments in the design stages. The early stages of the design process rely heavily on sketches and wireframes with no coding involved, meaning that they can not be processed by a screen reader. By consulting the expert and referencing the WCAG guidelines, the aim was to constantly account for an accessibility perspective during the design process.

Regarding menu and navigational structures, the expert mentioned that preferences often are individual, but stated SVT Play is a reference point for well-designed navigation. The screen reader focuses on the correct items and the user is directly navigated to the content of the menu by using the tab button on the keyboard. SVT Play furthermore supports keyboard shortcuts and allows users that want to solely navigate through the rubrics on the page and not enter its content, if they wanted to. Another aspect is regarding hierarchical menu structures, the expert stated that they feel comfortable using them, but stated that a lot of users have a distaste for these menu structures.

7.1.4 Define

The following section covers the methods applied in the define phase. The define phase is where insights from the previous stage are organized, analyzed and integrated into a problem definition. The methods used during this stage, and how they were utilized for that purpose are further explained below.

Affinity Diagram

An affinity diagram was used to analyze the data gained from the card sort. The various labels for categories that the users came up with were clustered into groups where similar themes and names were joined together into a subcategory. Based on subcategories that were popular amongst the respondents, main categories were created from groups of subcategories with a similar theme. There were several aspects that needed to be taken into consideration when constructing the main categories. The subcategories, the benefits and deals included in the clusters, and the number of users that grouped the content similarly were to be considered. This is to ensure there are no extreme outliers affecting the general perception of the

categories.

The affinity diagram generated new categories and subcategories based on user expectations gained from the card sort. The main categories that evolved from the related subcategories created by the users were *"Workplace, Health and Wellness, Food and Drinks, Travel, Discounts, Home and Lifestyle, Entertainment"* and *"Other"* (Appendix C). The new categories were then tested with users to evaluate if the assumptions made when grouping the data were legitimate or if adjustments should be made.

Persona

Three personas were created to explore the individual user experience from different perspectives. The derived personas were used to investigate the design and possible usability problems in the current information architecture on Benify's platform. The three personas were created to be as distinct from each other as possible but still be probable target users of Benify in order to cover a broader range of interactions and goals. Since the structure of the categories and available benefits vary between the companies, each persona was assigned a job position at different companies. This ensured that a broader range of usability problems was collected and not focused on a single company.

The first persona was Katarina, a 42-year-old woman from Stockholm who works in HR. She enjoys running with her dog, camping and yoga. She is furthermore interested in podcasts and likes spending time in nature. Her enjoyment of a quiet lifestyle causes her to have some agitation when tasks take a long time to complete or do not go as intended. Katarina often has trouble with time management which causes the need to be done with tasks as quickly as possible. Her main objective in using Benify's platform is to find benefits regarding sporting and wellness activities.

The second persona was Bob, who is a 64-year-old product developer from Gothenburg. He enjoys building Lego, trivia nights and going on walks with his partner. Bob furthermore likes spending time with his grandchildren and watching movies. However, he has some issues when it comes to technology and does not like overly complicated things. He desires a simple navigation that shows his intended result preferably on one page. Bob uses Benify in order to find information about his company-related pension and would like to learn more about how he should spend it.

The third persona is Rose, a 25-year-old university student currently working as a summer intern in Uppsala. She likes playing video games and cooking. However, she has a strict budget since she is a student and she is always in search of a good discount. Her interest in food and video games are quite expensive hobbies according to Rose and she wants to utilise any discounts that she can get with Benify.

User Journey Mapping

User journey maps were created with the persona, each with a distinct task. The aim of this method is to understand their interactions with Benify's platform and their corresponding emotion and thought processes. The character's needs and expectations were taken into consideration when creating the user journey maps. The task given to each persona was based on their specific interest and needs and covered different benefits or deals that exist on Benify. Katarina aimed to find benefits regarding wellness and sports activities (see Figure 7.5). Bob wanted to find information about his current pension plan through his employment (see Figure 7.6). Rose wanted to look for discounts on food and household items (see Figure 7.7).

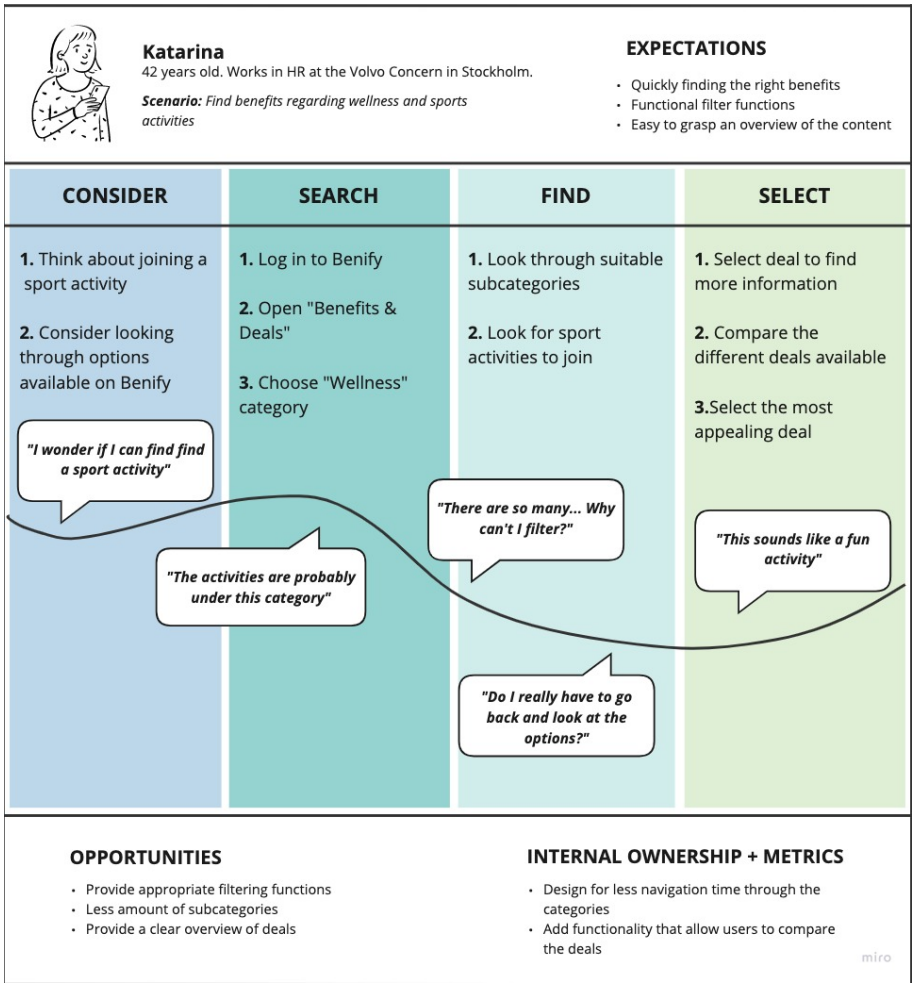

Figure 7.5: User journey of finding benefits on sport and wellness activities.

The journey map was based on an example provided by Nielsen Norman Group (2018)[61], and split up into four phases: consider, search, find and select. These phases were selected as they appropriately represent the phases in a common user journey through Benify's platform. The first phase represents a user before entering the platform and their initial idea of what they are searching for. Search depicts the phase in the journey where a user aims to find the right category to achieve their task. The third phase is when a user wants to find their benefit amongst the various

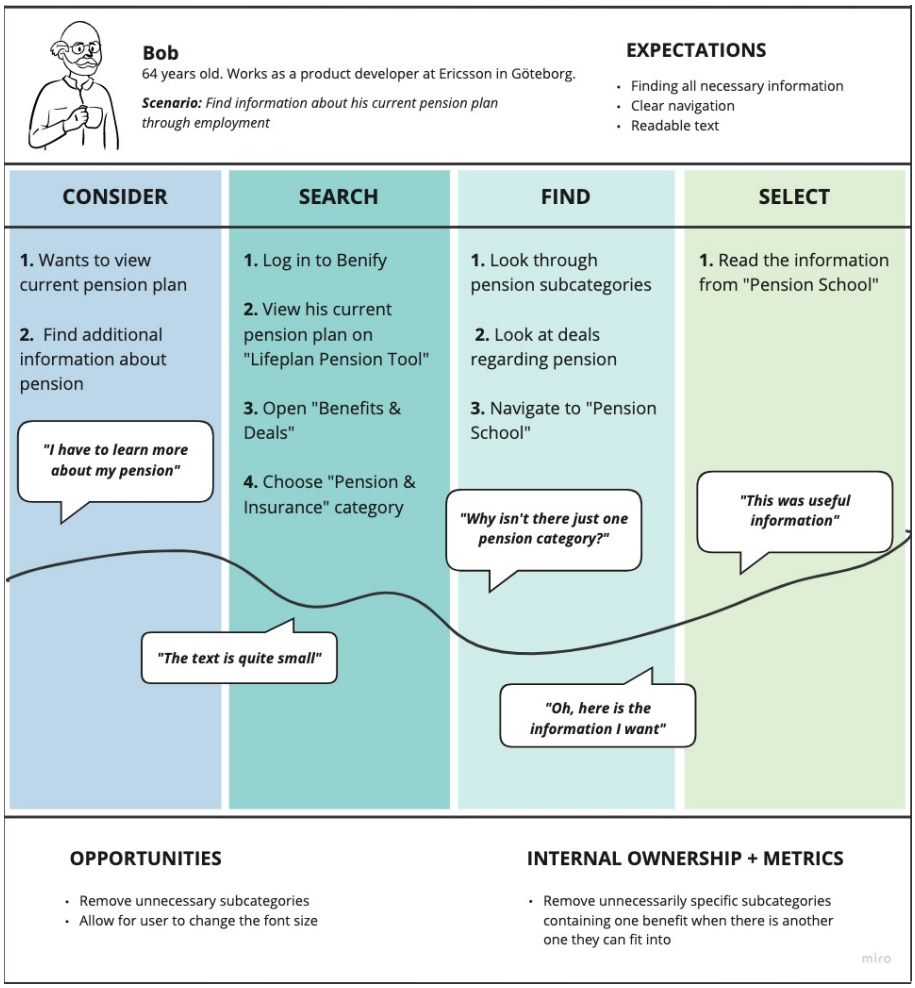

Figure 7.6: User journey of finding information about the pension.

categories. The final phase is called select and represents the instance when a user has found the correct benefit or deal and wants to learn more about it.

The actions taken by the persona are depicted in a numerical arrangement and show their step-by-step interactions with the platform. Each persona will start their journey with their intention behind using the Benify platform and end with finding the correct deal. The line across all phases represents the emotional state of the persona when trying to navigate through the platform and is elaborated with speech bubbles, representing their mindset during the user journey.

From the map, conclusions regarding possible opportunities were drawn as well as metrics of how these can be implemented in the design. The personas' emotional states tended to decrease between the "search" and "find" where they would utilise the navigational structure on Benifys platform. The need for a filter button and more compromised categories was clearly highlighted during the maps. Overall, the experience was affected by unclear information architecture and menu structure.

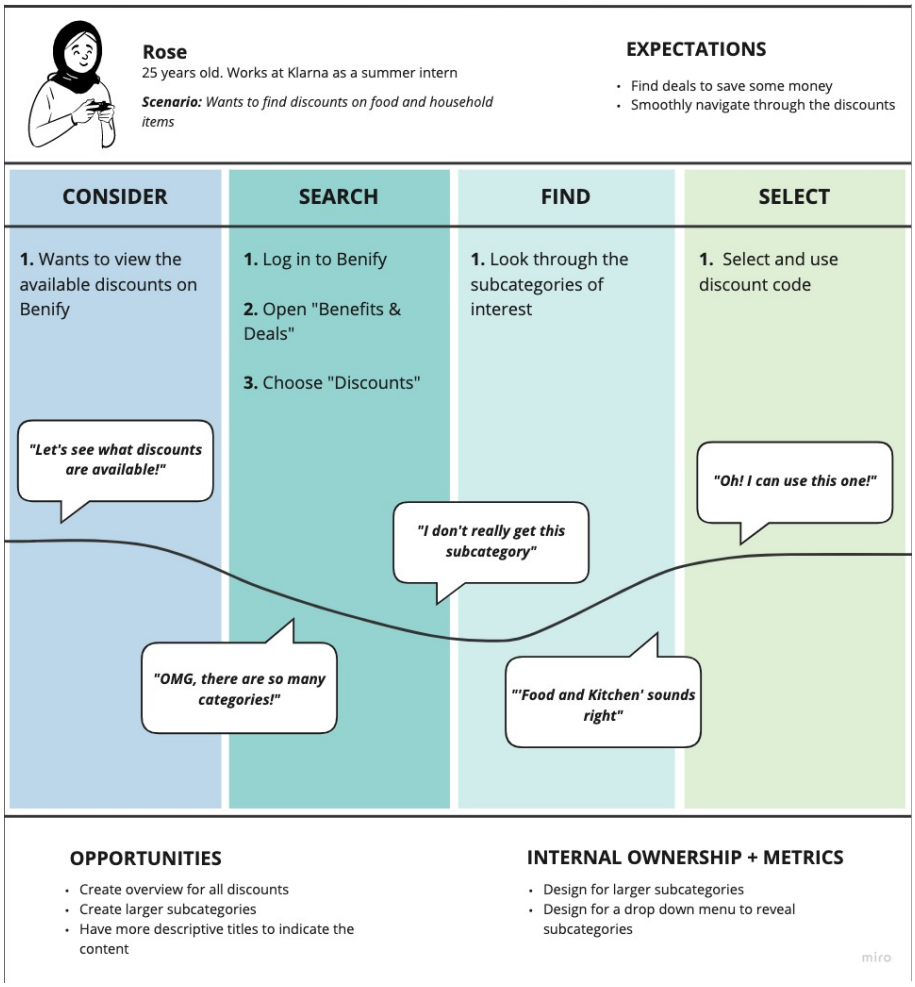

Figure 7.7: User journey of finding discounts on food and household items.

User Flow Diagram

User flow diagrams were created based on the personas and their individual goals using Benify's platform (Appendix D). Each persona was given three to four tasks and the diagram aimed to depict each step the user had to take in order to reach their goal. Katarina wanted to find discounts for her dog, activewear and find wellness activities. Bob wanted to find advice on his pension and insurance, find a physiotherapist and view available deals at the office. Rose aimed to find discounts on food and household items and benefits from their work. All tasks were created to depict how an average user might utilise Benify's platform and differed to create a more nuanced perspective on potential issues. Each user flow diagram started with the persona entering the benefits menu and searching for their correct category. Each persona was moreover assigned a position at different companies, as the selection of benefits may vary between companies. The diagram depicted the main category each persona would enter upon trying to achieve their task, as well as the related subcategories. In the end, the user flow diagram portrayed the distribution of related benefits and the number of subcategories they could be included in. The diagram gave an understanding of the number of categories a user would have to en-

ter before finding their specific goal. The conclusion was thereafter to create larger subcategories with more items and decrease the time searching between them.

7.2 First Iteration

Based on the user expectations of categories gathered from the card sort and the insight brought from the expert interview and user flow diagrams, a first iteration of the website design was created. This section aims to describe the first development stage from the sketches to the initial mockups.

7.2.1 Develop

In the first development phase, various methods are employed to explore potential design solutions for the established problem statement. It involves discussing and creating mockups of the initial design ideas based on data from the previous phase. The persona, user journey mapping and user flow diagram gave insight into the most problematic areas in the design from the perspective of user experience. The main found issues are regarding the navigation of categories and finding the correct benefit. An attempt was therefore made to create easier navigation to the benefit by changing the design of the drop-down menu and the exploration page. The actual categories will not be assessed in the mock-ups as they will be incorporated further along the iterations and will go through user tests of their own.

Crazy 8 and Sketching

The Crazy 8 method was implemented to generate initial ideas for the low-fidelity prototypes. The method resulted in 16 various sketches of potential concepts for an interface. Using elements from several of the sketches from the Crazy 8 method, two more extensive sketches were made to visualise a potential redesign of the interface (see Figure 7.8).

The common pattern from the sketches was to create a pop-up menu when a user decides to press on a benefit. This was introduced to allow for a quick comparison between the benefits without the user having to enter a separate page to find more information. Furthermore, the side navigation in the current interface was removed, and instead, a more interactive drop-down menu was introduced. Based on data from the expert interview an interface based on SVT Play was taken into consideration, as it has proven to perform well for screen readers and users with low vision.

Mock-Ups for Web

To create a further refined visualisation, sketches from Figure 7.8 were made into mock-ups using the digital visualisation tool Figma [74]. When designing the view for the benefits sorted into categories, the structure of the entire Benify website had to be taken into consideration. The current website utilises tabs to navigate to benefits and other information such as user accounts or general company information

Figure 7.8: Initial sketches from Crazy 8.

(see Figure 2.1). When generating the mock-ups the top app bar was kept from the current design and a redesign of the drop-down menu for the categories was created. Inspiration was taken from the drop-down menu applied by Mecenat on their website, where discounts are divided into categories and multiple subcategories. Several designs of the drop-down menu were created. Most of which would utilise a hover function to display the corresponding subcategories for each main category (see Figure 7.9).

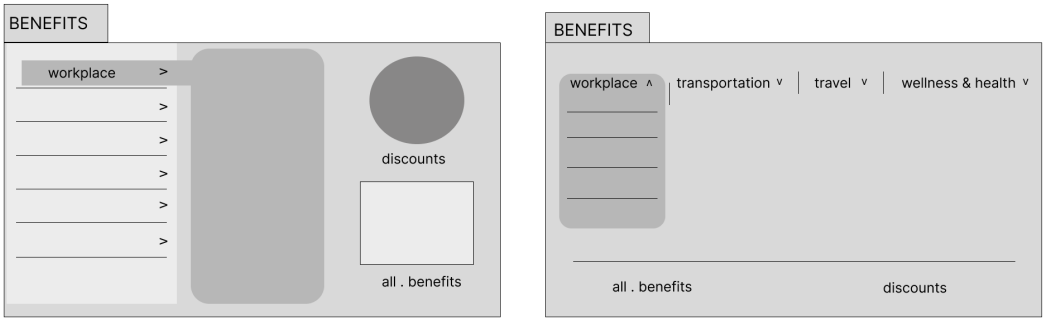

Figure 7.9: The design of the drop-down menu

When choosing a category from the drop-down menu, the user will be brought to a view where they can see the available benefits in that category. One design solution utilised a side navigation bar on the left side of the page to allow the user to get

an overview of the categories and either choose one or expand the menu so that the subcategories are visible as well. The benefits would be displayed in the middle of the page. The current user interface relies on a side navigation bar to navigate amongst subcategories, therefore this design option would be most similar to the original one (see Figure 7.10).

The other design used headers to display the categories along with the corresponding benefits using a card slider carousel for each category as seen in Figure 7.10. The expert interview revealed positive accessibility aspects of using similar information architecture as SVT Play in regards to structuring categories. The interviewee especially expressed appreciation for the keyboard-only functions that were implemented on the SVT Play website. Therefore the second design was heavily inspired by navigation components used by websites such as Mecenat, Netflix and SVT Play.

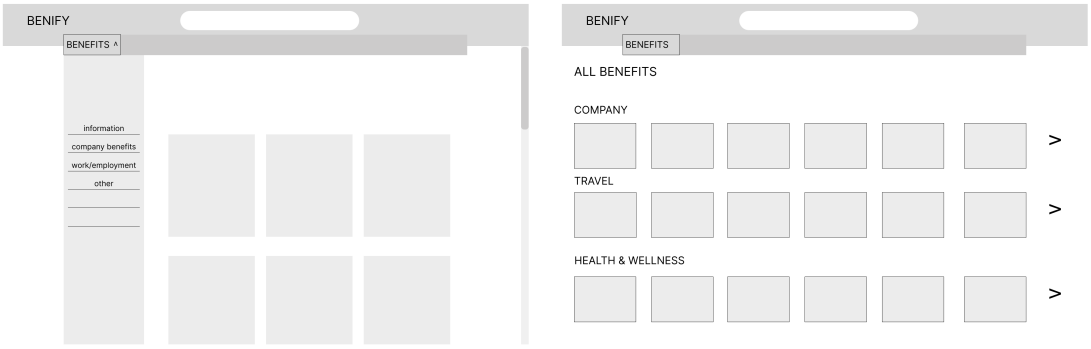

Figure 7.10: Alternative design of navigation through benefits (Side navigation bar on the left and card slider carousel on the right)

Mock-Ups for Mobile

The ambition of the mobile version was to allow the user to quickly and easily find what they are looking for. The current Benify app displays all benefits as soon as the user navigates to benefits via the bottom navigation bar (see Figure 2.3). When discussing the re-design of the mobile application it was early decided to explore starting with a list containing the main categories instead. Furthermore, the design solution was inspired by the interface present in the Mecenat mobile app. Since the benefits page is part of the Benify application which contains other content, the current information architecture which contains a bottom navigation bar was taken into consideration when re-designing the interface. Therefore the structure and design layout was created to be incorporated into the current Benify mobile application, using the existing bottom navigation bar to navigate to the benefits category list.

In the list of main categories (see Figure 7.11), each category opens a drop-down that displays the subcategories as well as a "see all" option. There are options for all benefits and benifyDeals as well, which leads to their respective pages. When choosing a category or a subcategory, the benefits within that category will be displayed.

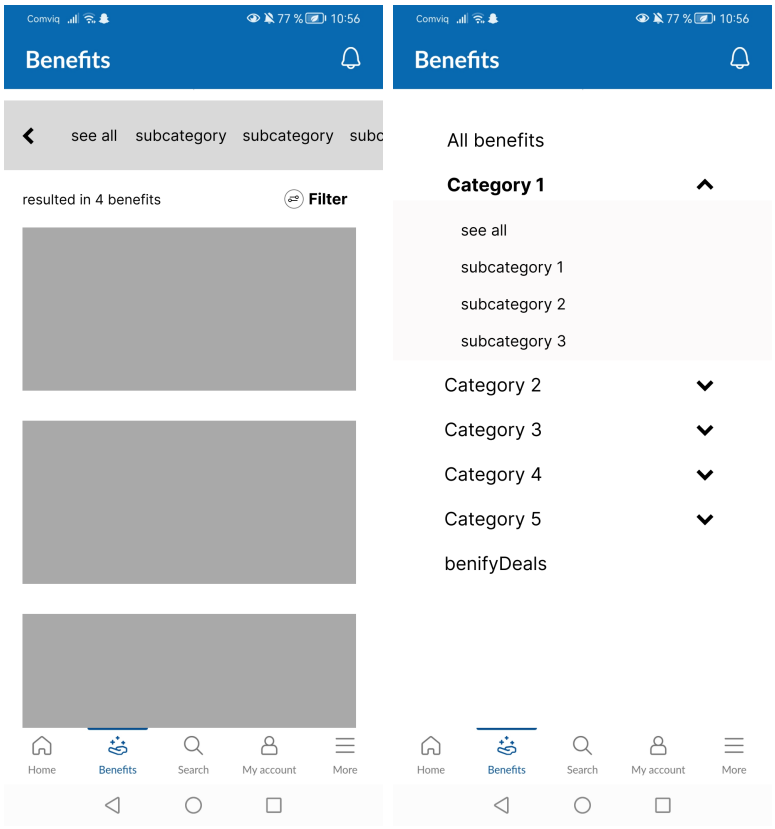

Figure 7.11: Mock-ups of benefits on mobile application

For the navigation between subcategories, there is a scrollable tab navigation component located at the top of the screen. On the left side of the tab navigation, there is a backward arrow which takes the user to the previous screen they were located on. On the left side below the tab navigation, the number of benefits in the category or chosen subcategory is displayed. To the right, there is a filter button which will provide a pop-up dialog where the user can filter to facilitate their search for specific benefits. Similarly to the website version, when choosing a benefit there will be a pop-up dialog with information about that benefit.

There was also an alternative version of the page displaying benefits within a category. For the alternative version, a drop-down list containing the subcategories replaced the scrollable tab navigation. For the benefit information pop-ups there were two different alternatives for how it would be visualised. The first design solution experimented with having a bottom sheet which covered half of the screen. The second design alternative was a bottom sheet which covered the whole screen with the intention of it sliding in from below (see Figure 7.12).

7.3 Second Iteration

The second design iteration was initiated by choosing to further refine and expand on the design inspired by Netflix, which utilises card slider carousels to navigate

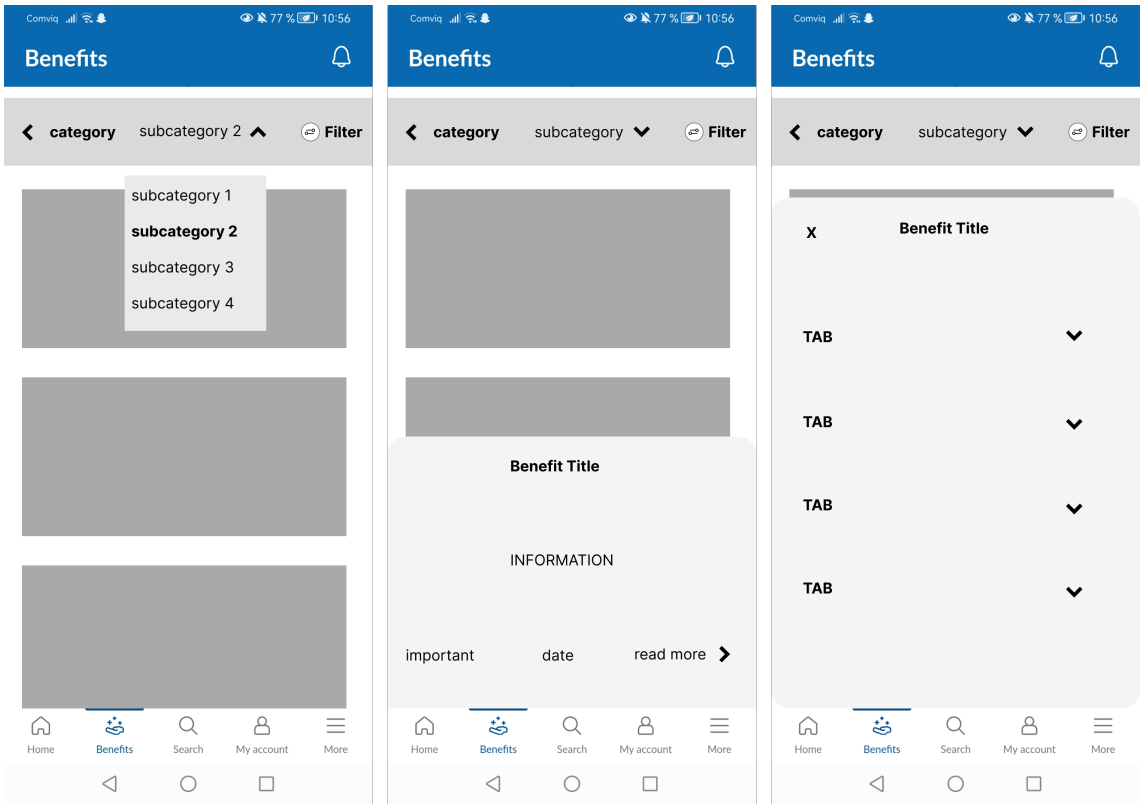

Figure 7.12: Mock-ups of choosing a subcategory or selecting a benefit

categories. During the expert interview, the user expressed a preference for the information architecture used by SVTPlay. Therefore, the second design option was chosen to be the one to expand upon. At this stage in the process, mock-ups of the mobile application were created as well. The categories created from the card sort were kept for this design iteration.

7.3.1 Develop

The following section covers the methods applied in the second iteration of the development phase. The created mock-ups will be more defined and the categories will be incorporated in the design. This section will present the key elements of the design and compare the new iteration to the current Benify interface. An explanation will furthermore be given as to why that design decision was made.

7.3.2 Categories and Tree Test

A tree test was performed based on the previously created categories from the card sort. The test consisted of five new benefits that could be interpreted as a bit ambiguous regarding their rightful category. The selected benefits were *Volunteering, Lexly (Order legal advice online), View approved wellness activities through your company, SF Anytime* and *Flights with Norwegian*. The first three benefits are the most uncertain regarding their placement, as they could potentially fall under one or more categories. They were therefore chosen in order to understand where the

respondents would expect them to be.

The two latter benefits are more straightforward in their placement, however, since the card sort there have been changes to the categories. Previously the category of *Entertainment and TV* has been incorporated under *Home and Lifestyle*, as it did not have enough benefits to stand as its own main category. The subcategory of Travel has also been introduced under the renamed category Transportation. Previously the category was called *Transportation and Travel* and did not include Travel as a subcategory. The two benefits were therefore chosen in order to test the new categories and if the changes were appropriate regarding their expectations (see Figure 7.13).

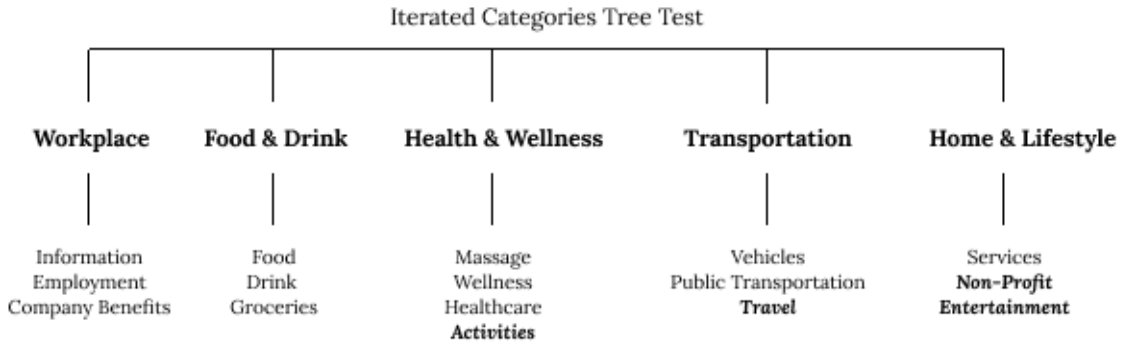

Figure 7.13: Iterated categories for tree test, changes are depicted as italic and bold

The major changes to the categories were, as stated, the elimination of *Entertainment and TV* as the main category. Some minor changes were also performed as the renaming of the subcategory Volunteering which is now called Non-Profit. The Fitness subcategory under Health and Wellness is called Activities instead in order to encapsulate a wider range of benefits suitable for that placement. Travel, is furthermore a part of Transportation, as we did not deem it to be as important as Transportation and thereafter abiding by the design principle of hierarchy in information architecture.

The tree test was created using Maze and sent out to users between the ages of 23-60 [73] and received 16 participants. The participants were asked to find five benefits that were located in different subcategories. Based on the benefit title, the participants navigated amongst the existing categories and subcategories to find the benefit. After correctly identifying the benefit, they were asked to elaborate on why they selected that option in an open question. Using Maze, each path the participants took to find the benefit could be tracked and compared. If the participant's path did not correspond to where the benefit was located, it could be a sign that the benefit is not sorted into a category that matches the user's expectations.

The data showed promising results regarding how well the benefits were divided into

categories and subcategories that matched the users' expectations. The categories and subcategories that were created and used for the tree test can be seen in Figure 7.13.

Result of Tree Test

During the tree test, the data showed that only a small amount of participants, specifically three out of sixteen were able to identify the direct path to the benefit *Volunteering*, which was placed under the Non-Protit subcategory. However, despite the initial difficulty, a majority of 13 participants were able to locate it eventually through alternative routes. Interestingly, the alternative routes taken by these users were quite diverse and there was not a single common path among them. According to the comments left by six participants, they suggest that the benefit should be placed under "Workplace" instead. This result suggests that users have different ways of approaching navigation and the design should thereafter accommodate these various paths.

Six out of sixteen participants were able to locate *Lexly (Order legal advice online)* directly by going to Service under the *Home and Lifestyle* category, which was the intended placement for the benefit. The second most common path was to search under the *Workplace* category which was taken by five participants. Despite the unsuccessful path for some participants, the comments revealed that the categorisation of benefits made sense once the benefit had been located. Five participants believed however that the Workplace category would have been a more suitable placement for online legal advice.

Twelve participants located the correct benefit of *View approved wellness activities through your company*. However, only one participant was able to locate the benefit with its intended direct path through the subcategory Information under the *Workplace* category. The test resulted in 16 individual paths in order to reach the benefit. Even though the result did not depict any direct success it is still important to note that a large majority of participants were still able to locate the benefit in the end.

SF Anytime had a direct success from eleven participants and fifteen participants were able to locate the benefit overall. The direct path intended was to select the subcategory Entertainment under *Home and Lifestyle*. This was an implemented change after the card sort and went against the stated expectations from the users, who created their own category for entertainment benefits. However, with these results, it was a comfortable design choice to continue having it under *Home and Lifestyle* as 93.75 % of participants were still able to locate the benefit.

The last benefit of *Flights with Norwegian* had a 100 % direct success rate with all participants correctly locating the benefit with its intended path. All comments stated that it was the most logical path and that they did not consider any alternative path.

The results were promising for the purpose of the test. Even though participants may

have taken alternative paths to find the benefit, the great majority of the participants were still able to find it. This highlights the importance of accommodating different paths and ensuring that the design is flexible enough to design for users' varying navigation habits. From the results, a conclusion can be drawn regarding that some benefits are more difficult to locate than others. Only one participant was able to find *View approved wellness activities through your company* through its intended direct path. This furthermore illuminates the importance of ensuring that the benefits are easily discoverable and accessible, even though they are not placed under the most obvious category.

7.3.3 Drop-Down Menu

Below, the underlying concept and thought process that informed the initial design decisions for both the web and mobile menus will be discussed. As the menu containing categories is the first element a user encounters, it is imperative to enable seamless navigation without excessive clicks. The user should be able to gain a comprehensive overview of all options and feel confident that they understand what is available without becoming disoriented.

Website

After reviewing the Crazy 8 sketches, the initial concept was to implement a hover-enabled drop-down menu. This means that the related subcategories will be presented on the right-hand side by simply hovering over the title of the main category. The current Benify interface does not incorporate this feature, resulting in difficulty for users to obtain an overview of the subcategories. The goal is thereafter to reduce the number of clicks required for the user, by granting them access to the subcategories directly in the drop-down menu. When employing a screen reader, users can choose to view only the primary categories or access the subcategories through a key command shortcut. This feature enables users to compare subcategories and navigate to the desired benefit without exiting the menu (see Figure 7.14).

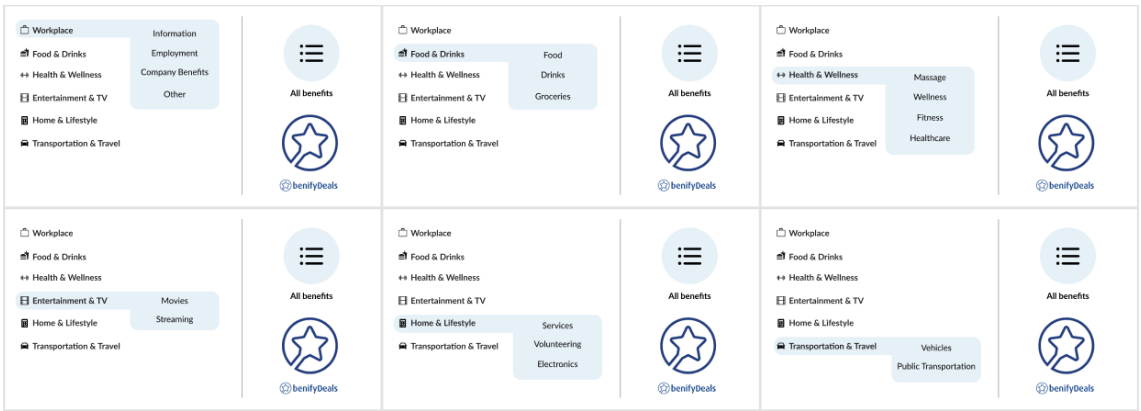

Figure 7.14: The design of the drop-down menu

When testing the hover functions on the drop-down menu, it became clear that the layout of the menu was not satisfactory. The subcategories were displayed too in-

coherently and the colour shadow around them distracted from the text, making it difficult to read as seen in Figure 7.14. The placement of All Benefits and BenifyDeals on the menu was also discussed since grouping them together with similar appearances might be confusing to users. It was important to create a distinction between Benefits and BenifyDeals as previous feedback stated a confusion between the two. As depicted in this iteration, the users could potentially group together All Benfits and BenfiyDeals which would be incorrect. According to the design principle of emphasis, a potential strategy would be to make BenifyDeals stand out from the rest of the elements in the drop-down menu in order to accurately create a distinction between them [22]. The design was therefore iterated in the following phase.

Mobile

The menu structure for the mobile version has stayed consistent with the previously created mock-ups. When a user chooses to view benefits they will be presented with all the main categories and their respective drop-down menus containing the sub-categories. As for the website, an All Benefits button is placed above the categories to represent hierarchy and visibility [22].

The wireframe interface features a clear separation of categories, indicated by a faint line and an arrow, allowing for easy differentiation between each section. Notably, the category BenifyDeals is presented in a distinct font and style, setting it apart from the rest of the categories containing benefits. The added feature of icons in the design adds to the clarity and ease of use of the interface, making it simpler for users to distinguish between categories at a glance

The category *Entertainment* remains present in the wireframe, as the categories were yet to be analyzed through the tree test (see Figure 7.15). This layout prioritises the clear presentation of information, with the goal of making it accessible and intuitive for the user. The overall aim is to make each category stand out so that the user can easily locate and access the benefits they need.

7.3.4 Searching for a Benefit

This section will delve into the redesign of the interface when a user has selected a category or subcategory and begins searching for a benefit. This design iteration has been developed based on the sketches and mockups, incorporating valuable insights gathered from the expert interview.

Website

The initial mockup of the side navigation bar was scrapped in this iteration, and the design decision to follow the interface inspired by SVT Play was established. During the expert interview, it was highlighted that the SVT Play interface was particularly helpful for screen reader users due to its clear and efficient overview of the website. The expert appreciated the option to navigate amongst the categories

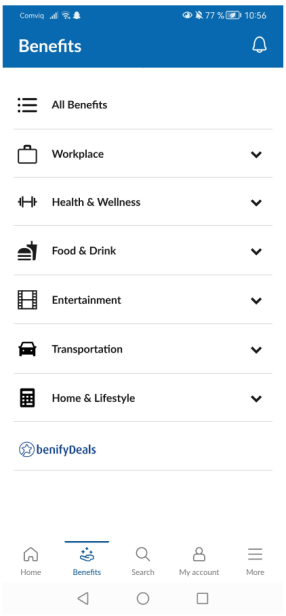

Figure 7.15: The design of the mobile category list

or directly enter its content. This valuable feedback was taken into consideration during the redesign process, with a focus on improving the navigation experience for screen reader users.

In order to help the users find the benefits they are looking for, the redesigned interface includes a number of features. For example, when a user selects a main category, they are first presented with an overview of the available subcategories, complete with a preview of some of the benefits that can be found within each subcategory (see Figure 7.16). This approach is, as mentioned, similar to the one used by SVT Play, which uses previews to help users navigate amongst their content more easily.

To facilitate users finding the benefit they are looking for, the benefits within each subcategory are displayed on multiple rows, providing a clear overview of the available options. This approach is particularly helpful for subcategories with a large number of benefits, as it allows users to quickly scan through the available options and find the ones that are most relevant.

In addition, the redesigned interface includes two tabs for each main category: the "Discover" tab which presents benefits according to subcategories, and the "All" tab which presents all benefits within that category in alphabetical order. This allows users to browse benefits in whichever way they prefer, whether they want to focus on a specific subcategory or simply explore all available options.

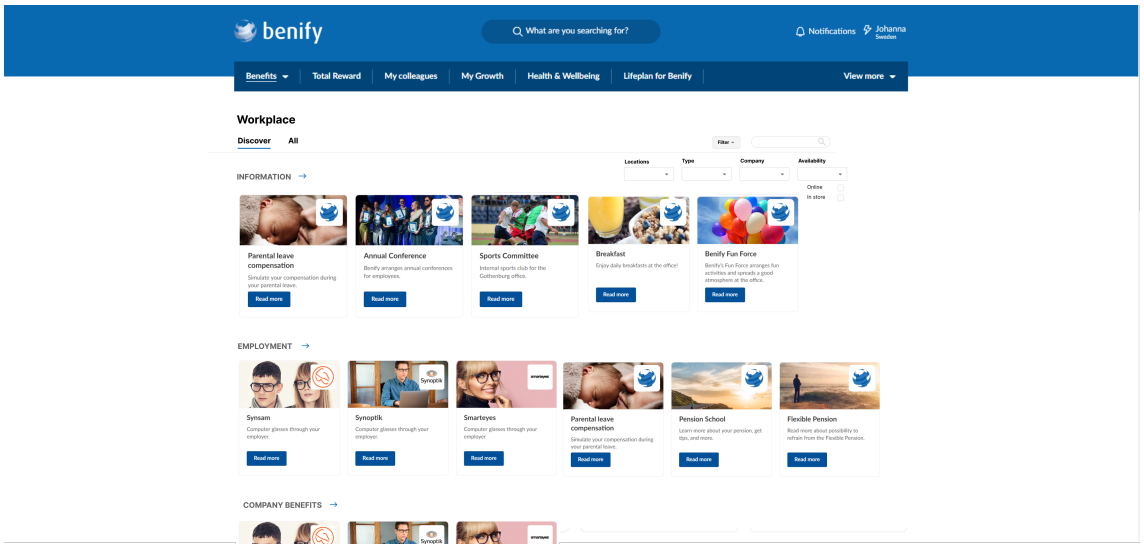

Figure 7.16: View of the benefits under "Discover" tab for Workplace

Mobile

When a user enters a category on the mobile version they are presented with the benefits in a list, as in the current interface on the Benify app. However, this iteration resulted in two possible designs for the navigation among the categories. A new version was created where the user navigates through a scrollable tab navigation. The subcategories are presented in a list and the user can swipe at the top of the screen to navigate to their desired destination (see Figure 7.17).

Based on the mock-ups the design involved a drop-down menu where the only two elements on the top app bar are the main category and that chosen subcategory. By pressing the subcategory a drop-down menu will be exposed and the user can select another subcategory. However, after careful consideration, it was deemed inefficient as it would create more cluttered navigation. Including a drop-down menu over a benefit would disrupt the user's view of the content. Therefore, a scrollable tab navigation was determined to be more advantageous.

The position of the main category was furthermore iterated. On the version with the drop-down menu, the main category is featured on the top app bar, besides the subcategory. To differentiate the text from the surrounding elements, it has been assigned a distinct colour that contrasts with the rest of the interface. This is done to prevent any confusion that might arise from the text being mistakenly associated with nearby elements. The second design with the scrollable tab navigation has positioned the name of the main category at the top of the page. In this scenario, it was determined that placing the main category on the top app bar would not be appropriate since it is not an interactive element, unlike the other items in its proximity. This decision was made to ensure the overall aesthetic of the interface is maintained while also keeping the design functional and intuitive for the user.

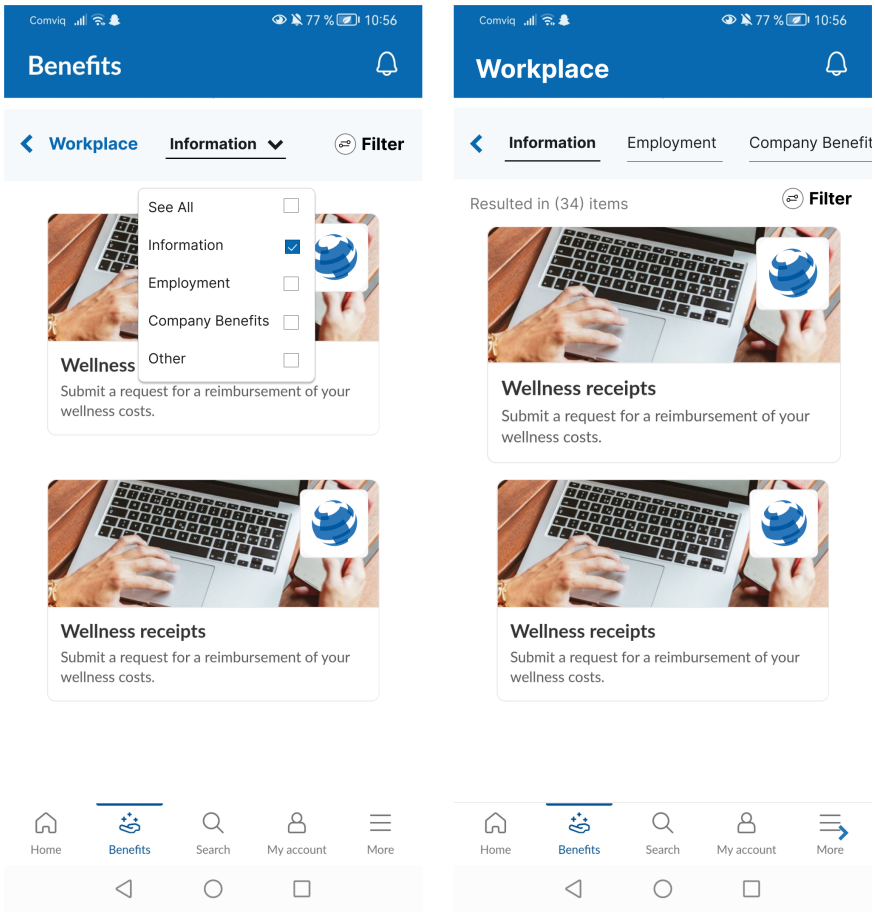

Figure 7.17: Two alternatives for choosing subcategories

7.3.5 Selecting a Benefit

It was decided to incorporate a pop-up menu or bottom sheet menu when a user interacts and selects a benefit. This feature enables users to quickly compare the different offers without navigating to a new page. In the current design, selecting a benefit on the web or mobile opens it up on a new page, and the user has to navigate back to view the offers again. Moreover, when a user opens a benefit under the "see more" button on the app, they are returned to their previous position and need to scroll down again when exiting the benefit. By iterating the interactions with a benefit, users can access them without leaving the current page and can return to their original position by tapping anywhere outside the menu.

Website

When a user selects a benefit on the web design a pop-up will menu appear to reveal more information about the offer (see Figure 7.18). The background will be darker to add more contrast to the page and create focus on the menu. The user can then select the benefit by pressing on the "Read More" button on the bottom to find the

full information page or press anywhere else to close the menu. On the other hand, if a user wants to skip the pop-up menu and access the information directly, they can choose to press the "Read More" button directly on the benefit and they will be directed there. If a user, however, wants to compare benefits and gain a small overview of its content, they can press anywhere else on the benefit and the pop-up will appear.

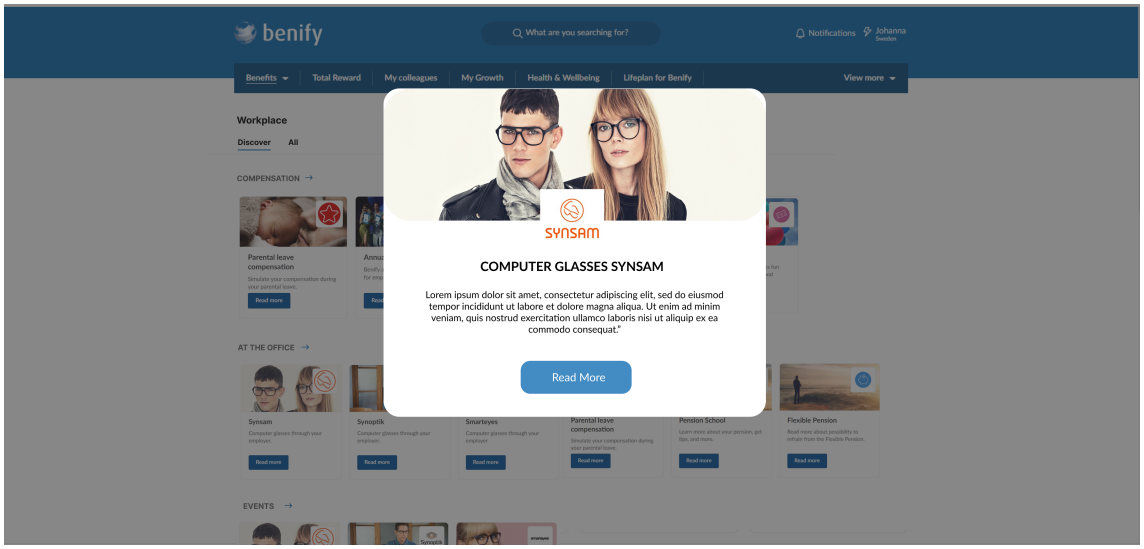

Figure 7.18: Inital design of pop-up menu for web

Mobile

In the mobile version of the interface, a bottom sheet menu is utilised to display information about the benefit (see Figure 7.19). The menu covers half the screen, making it easy for users to close the menu if they wish to return to their previous position on the page. The design was chosen as it allowed the user to quickly access information about the benefit without disrupting their browsing experience. Additionally, by placing the menu at the bottom of the screen, it ensures easy accessibility by the user's thumbs. However, as the design process continued it was clear that this type of menu did not depict enough information about the benefit to be valuable to the design. A new solution for the bottom sheet menu was therefore created in the following phases.

7.4 Third Iteration

During the third design iteration, the wireframes for the mobile and website versions created in the earlier iteration were further developed into high-fidelity prototypes using the Figma prototype tool [74]. Some design details were adjusted to improve the design and make it more coherent and intuitive. There was also a change in the category structure. When adding benefits available on the Benify platform it was discovered that *Entertainment* as a main category would only contain two subcategories and might not be suited as a main category. *Entertainment* was

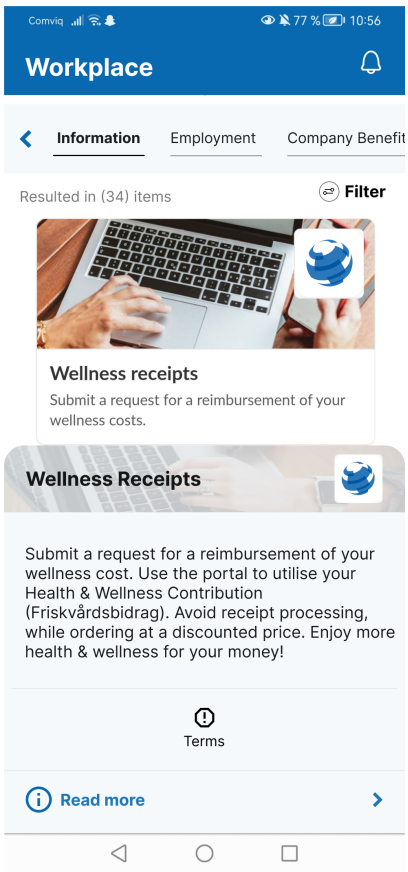

Figure 7.19: Initial design of bottom sheet menu for mobile

therefore decided to be added as a subcategory under *Home and Lifestyle*. This was due to the previously mentioned notion of the taxonomic hierarchy, where the middle-level categories are closely related to one another within a category [29]. A decision was therefore taken to place the subcategory in *Home and Lifestyle* as the other subcategories were the closest in relation and attributes.

7.4.1 Develop

The following section covers the methods applied in the third develop phase. During this iteration of the develop phase, the design solutions are refined into detailed prototypes with high fidelity. The methods will be described in the following sections. The final result and the design choices made during this iteration will be presented in Chapter 7 *Results*.

High-Fidelity Mobile Prototype

Most of the design components for the mobile version were kept from the second design iteration, with the exception of minor adjustments regarding the alignment

of some components and icons. Using the Figma prototype tool, the wireframes and components were prototyped so that the buttons and menu items can be interacted with. Animations were prototyped for pop-up components to imitate the feel of a working application. Pages for each category, as well as three subcategories necessary for the usability test were created. A filter mechanism for the mobile version was not designed during this iteration due to time pressure. However, it was discussed that a potential design solution for the mobile filter would be a down-scaled version of the filter pop-up on the web version.

High-Fidelity Website Prototype

The drop-down menu was further re-designed and adjusted from the last iteration (see Figure 7.20). However, this version of the drop-down menu was additionally modified for the final design and will be presented in more detail in the next chapter. During this iteration, some alignment details and positioning of icons and components were adjusted. Furthermore, a lot of time was spent on creating separate pages for each category, as well as three subcategories that were needed for the usability test. The navigation through tabs was also partly implemented so that the user can click on "Benefits" from all pages and get access to the drop-down menu. Furthermore, the tabs, carousels and pop-up components on each page had to be interactable in order to extract as much data and insight from the usability test as possible.

Figure 7.20: The first re-design of the drop-down menu

7.4.2 Deliver

This section describes the final phase of the project, where the created design solution is tested. The methods utilised at this stage to gain data from users and test how the design solution succeeds in regard to the problem statement are explained below. To evaluate the design, a heuristic evaluation was conducted to find any usability problems. After this, a usability test was performed in order to gain an understanding of the user experience and if the design lived up to expectations. A

thematic analysis of the data was thereafter performed to evaluate the findings from the usability test.

WCAG Testing

A WCAG testing was conducted to evaluate which guidelines the prototype satisfies at this stage (Appendix E). The guidelines were each checked by either practically trying the prototype or checking the visual aspects. The prototype was developed using Figma without any code, meaning that some of the guidelines were difficult to implement as working parts of the prototype. Therefore, the guidelines related to design that could be applied to this project were selected and used for the WCAG testing. Some of the selected guidelines are relevant to the role of UI/UX designers but could not be implemented in the prototype during the timeframe of this project and will instead be discussed for future work.

Usability Testing

The usability tests were conducted with six participants, with the aim of understanding the user experience of the prototypes. The participants all received the same instructions before the test and were asked to use the think-aloud technique during the navigation of the wireframes. Three participants viewed the web version first and then the mobile, while the other three participants got the tests in the opposite order. This was to eliminate any possible bias that could facilitate or challenge navigation on the second platform. The objective of the test was to locate three benefits on the web platform and three on the mobile platform.

Semi-Structured Interview

Semi-structured interviews were conducted in conjunction with the usability test to gather qualitative data and gain insights into participants' experience with the design and navigation of the prototype. After completing the usability tests, participants were asked a series of questions to elicit their feedback.

The interview was recorded and consent was given by the participants to store the recordings during the duration of the project. The interviews are anonymous and the participants were given this information before the start of the usability test. The interview was originally conducted in Swedish and the questions have been translated for inclusion in this thesis. The prepared questions included the following:

- How did it feel when doing the tasks?
- Did you feel any difference between web and mobile?
- How did you experience the navigation?
- Is there anything you feel is missing?

- Is there anything you thought was difficult?
- Is there anything you like about the design?
- Could you follow the design?
- Did the design live up to your expectations on a navigation menu?
- Is there anything else you thought about during the test?

The results obtained from these interviews were analyzed using thematic analysis and heuristic evaluation techniques, allowing for a comprehensive examination of the data. The findings will from this analysis will be discussed in more detail in the subsequent sections.

Thematic Analysis

A thematic analysis was performed based on the semi-structured interviews from the usability test. After the interviews had been conducted, they were transcribed and codes were identified thereafter. The codes were created after an interesting topic had been brought up in the interview and are a description of the context and sentence. Since the aim of the usability test was to understand how it related to the user's expectations, the codes were related to that theme. Twelve codes were created and some examples were "Categories", "Expectations", "Design" and "Difficult". The codes were only given to a specific sentence if that word was mentioned explicitly.

From the twelve codes, six themes could be noted (Appendix F). The themes were derived from the associated codes and are a more descriptive interpretation of the data. The first theme was "Components" which consisted of the codes "Menu", "Categories", "Search", "Filter" and "Benefits". The theme is aimed to depict the participant's evaluations of the various components that are included in the interface and from

The second theme was "Experience" which included the codes "Easy" and "Hard" where participants explained their experienced opportunities or difficulties while navigating the interface. Comments regarding "Web" and "Mobile" were divided into their own themes, as it was vital to understand the potential differences and similarities between the two platforms. The two last themes were "Design" and "Expectations", the former included the codes "Navigation" and "Design" while the latter only referred to instances where the participant mentioned their expectations in regards to a navigational structure.

Based on the analysis, some conclusions can be drawn about the interface. Users generally found the navigation to be intuitive and aligned with their mental models of what to expect in an interface. There was an appreciation of the design choices in the menu and participants expressed that it was "modern" and "well-known". Furthermore, good colour choices and spacing prevented accidental presses. However,

some participants felt that the drop-down menu could be larger to include more components and that the search button or breadcrumbs should be more prominent. Participants furthermore suggested aligning the text of the subcategories to the left and making the font size bigger.

On mobile, the results indicated an appreciation of the adaptation to the platform and found it easier to navigate than the web version. However, the results showed that the feedback could be improved when a user selects a subcategory. Participants also appreciated the possibility to search and filter to find a benefit and suggested creating a representation of it in the next iteration.

Some participants found the top bar navigation on the web to be unclear, as the usability test started with it closed. On the mobile version, they were directed to the benefits directly, whereas, on the web version, they have to locate the menu. There was furthermore some confusion about the differences between the Discover and All tabs.

Overall, the participants found the interface to be clean and simple which lived up to their expectations. There were furthermore some suggestions for improvements in terms of text alignment, font size and search functionality. The interface seemed to be more effective on mobile, the participants, however, this did not seem to affect their experience of the interface.

Heuristic Evaluation

A heuristic evaluation was performed on the prototypes in order to find possible usability problems. The interactive elements evaluated against the ten heuristics were interactions that were not a part of the usability test. The chosen interactions were important to evaluate on their own as they are vital components in the user flow, even though they could not be tested in the previous usability test.

The first interaction tested was when a user wants to find a benefit under the "Discover" tab that is not in the first preview on the carousel. This interaction is performed on the web version, and no participant used the "Discover" tab during the usability test, which is the main reason for evaluating this interaction. The second interaction was how a user would mark a benefit as a favourite and later navigate to their collection in the drop-down menu. The last interaction was how a user would navigate from the pop-up menu to the information page about a benefit.

These interactions were compared against the ten heuristics in order to identify any usability problems. The evaluation resulted in further insights regarding the "Discover" and "All" tabs for the web platform. The heuristic that was violated during the first walkthrough was regarding "visibility of system status" [72]. The title of the tabs does not effectively depict the user's location on the platform and the names should be iterated to provide further indications of their content.

A potential usability issue arises in the second interaction concerning the "recognition

rather than recall" heuristic [72]. When a user selects the heart icon to mark a benefit as a favourite, the visual feedback indicates the action's success, but there is no clear indication of where the favourites are stored. Currently, they are located in the drop-down menu, which poses a challenge if users overlook this location and cannot retrieve additional information. This violates the heuristic as it relies on the user's memory to recall the storage location. One possible solution is to display the favourite benefits directly on the page instead of hiding them in the drop-down menu or providing descriptive text indicating storage location.

A violation of the "error prevention" heuristic was observed in the third interaction, specifically related to the selection of the pop-up menu [72]. There are potential challenges for users, particularly novices, in distinguishing between accessing the pop-up menu and directly accessing the information. With two alternative routes available, errors can occur. Users may either overlook the existence of the pop-up menu or directly click the "read more" button on the benefit, or mistakenly believe that accessing the information requires going through the pop-up menu. To address this issue, a possible solution would be to provide clearer affordance that indicates the expected outcome when a user makes their selection. This could involve displaying a message specifically during the user's initial interaction with the interface to guide their understanding and prevent potential errors.

8

Results

This chapter will present the created categories and the final design solutions for the web and mobile applications. This section will furthermore present the eight guidelines for what should be considered when designing a categorisation interface.

8.1 Categorisation

Developing the new categories involved an in-depth analysis of the affinity diagram generated by the card sort and further confirmed through a tree test. The findings from this analysis revealed insights into participants' categorisation preferences. It was observed that participants tended to create main categories and subcategories that were more generalized compared to the existing categorisation structure on the Benify platform.

Drawing upon the principles of taxonomic hierarchy [32] and Lakoff's conceptual framework [31], the formulation of the new categories took into account the inherent nature of categorisation (For more information about the conceptual framework see Chapter 3.4 *Categories and Categorisation*). The labels for the subcategories were derived from the patterns observed in the affinity diagram, capturing the specific themes and patterns identified by the participants. The main categories were constructed thereafter to provide a more generalised perspective of the content.

By aligning the categorisation structure with the participants' mental models and preferences, the aim was to enhance the usability and intuitiveness of the category system on Benify's platform. While the implementation of these categories may require future development and coding efforts, the design has been consciously adapted to accommodate this future version of the platform on both web and mobile.

8.1.1 Created Categories

The main categories that were created when reconstructing the existing categories from Benify's platform were *Workplace, Food and Drink, Health and Wellness, Home and Lifestyle* and *Transportation.*

The *Workplace* category holds benefits that are related to the office or employment. This category is designed to encompass various aspects and offerings that pertain to the workplace setting. Users can find offerings such as information about leave of absence or pension, conferences and office equipment. The related subcategories derived from the card sort are *Information, Employment, Company Benefits*.

Health and Wellness allows users access to a variety of benefits related to maintaining and improving their well-being. This category may include gym memberships, fitness classes, wellness programs, meditation, mental health support and mindfulness resources. This category will furthermore include wellness benefits associated with the company, as was revealed from the tree test. The following subcategories are *Massage, Wellness, Healthcare, Activities*.

Under the category *Food and Drink*, users can discover a range of benefits and offerings related to culinary experiences. This category may include discounts for restaurants, cafes, food delivery services and meal subscriptions. The created subcategories are *Food, Drink, Groceries*.

Home and Lifestyle stores benefits related to their living environment and daily life. This category may include benefits on household services, movie streaming platforms and sustainable living products. The subcategories related to this main category are *Services, Non-Profit, Entertainment*.

Under the category *Transportation* users can access various benefits related to different modes of transportation. This category may include discounts on public transportation, car rental services, parking solutions or electric vehicle stations. The subcategories are *Vehicles, Public Transportation, Travel*.

8.2 Final Design

This section will present the final design of the Web and mobile application prototypes. Design choices will be motivated and corresponding images of the user interface will be presented. The design prototypes were designed with the principle of Growth in mind, to keep the information architecture and design elements relevant even with a growth of content in the form of benefits or subcategories[26].

8.2.1 Web Version

The final design of the web version utilizes the same top app bar component that is present in the current Benify interface. To the far left of the tabs, there is a button called "Benefits". A drop-down menu appears when selecting "Benefits", giving the user an overview of the existing categories. The intention behind the redesign of the drop-down menu was to minimise the number of clicks the user has to do before reaching their destination by providing an overview of the subcategories directly in the menu.

When choosing a category the subcategories appear on the right side (see Figure 8.1). Furthermore, the blue colour is utilised in a minimalist but distinct way compared to the previously presented design solutions. The colour is used for feedback on where the user is in the navigation structure, without overwhelming the user with larger shapes of colour that change when hovering over the categories. The user has to actively select a category by clicking on the category rather than hovering over it to see the related subcategories, which from an accessibility aspect facilitates employing keyboard-only navigation (see Figure 8.1). Additionally, the structure of the drop-down is designed according to the principle of Disclosure, guiding the user to make their own predictions about what information they will be presented when selecting a category, and then a subcategory[26].

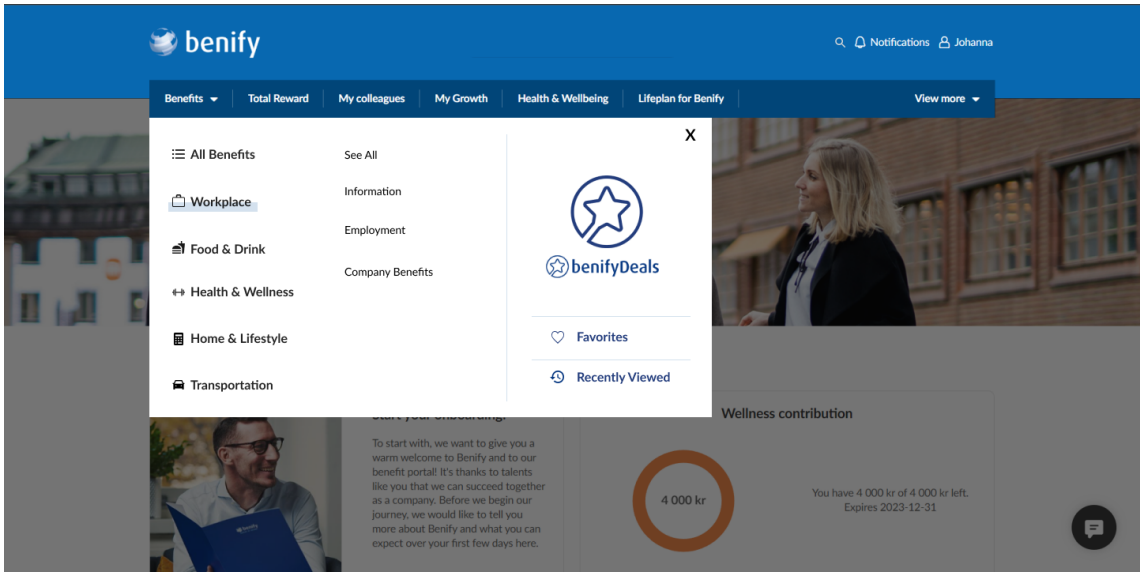

Figure 8.1: The chosen design solution for the drop-down menu

On the right side of the drop-down menu, the layout was changed to the "benifyDeals" logo at the top a link to Favorites, which brings the user to their saved benefits. Having a favorites function allows the user to save their most-used benefits and deals in the same place, without having to navigate through different categories or search for them. Below favourites, there is "Recently viewed" which brings the user to the benefits that they have recently visited. Favourites, Recently viewed and benifyDeals are also separated using dividers to make a distinction between the three in accordance with the Emphasis design principle[22]. When the drop-down is opened, the background gets darker to direct the users' attention to the menu content conforming to the Visibility design principle[22].

When selecting "All Benefits" in the drop-down menu, the user is brought to a page where all benefits are structured in a "Discover" view (see Figure 8.2). The purpose of the Discover view is for the user to get a better overview of which categories there are, as well as what kind of benefits belong in them.

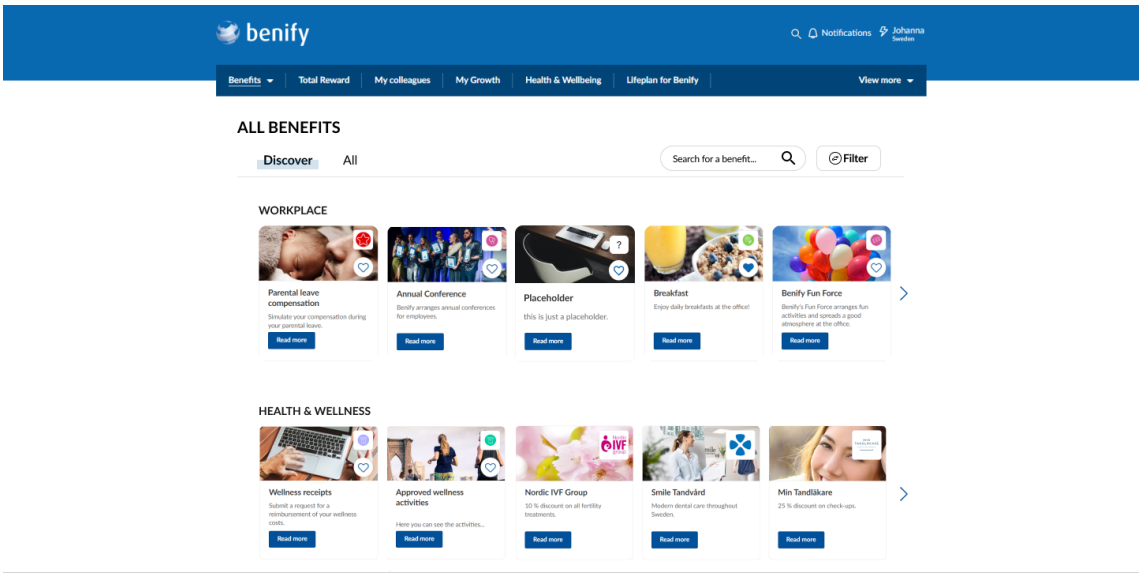

Figure 8.2: Wireframes of the "Discover" view

To display benefits on the "Discover" view, a category card slider carousel was created (see Figure 8.3). The carousel contains the name of the category as a header and the benefit cards below, with the purpose of following the Mental Models design principle and visually representing the users' mental models regarding categorisation [22]. The carousel component also follows the principle of Exemplars, the user examples of the information they will be presented when selecting a category [26]. When hovering on the carousel with the cursor, a blue square appears on the header as a pliancy hint as per the Visibility design principle [22]. An arrow is present on the right side of the carousel suggesting that there are more benefits that can be seen. If the user has started scrolling in the carousel using the arrow, another one appears on the left side of the carousel, indicating to the user that they can go back to the first benefits. The same carousel component is used to display the subcategories when the user has entered a category from the drop-down menu.

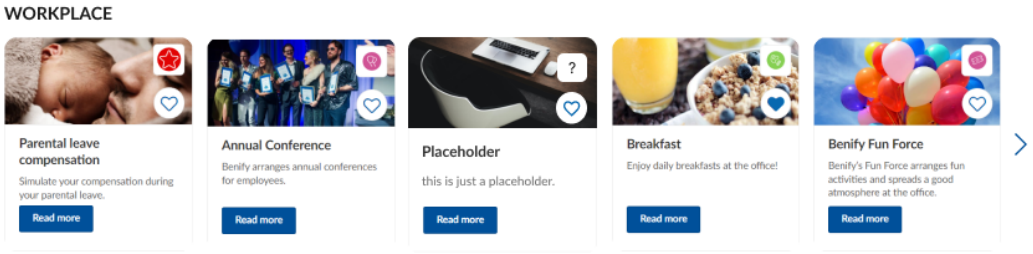

Figure 8.3: The category card slider carousel component

If the carousel header is clicked on, the user will be brought to a view that displays all benefits within that category or subcategory. On the category pages, a backward button is positioned on the left side of the title. Clicking on the backward arrow will

bring the user to the previous page they were on. Recognizable icons are used and elements are kept consistent regarding functionality and positioning to align with the Consistency and Affordances of design principles[22].

There is also an "All" benefits view where all benefits are displayed in alphabetical order using a card grid (see Figure 8.4). Below the top app bar, there is a header that clarifies which page the user is on. Furthermore, below the header on the left side, there are two tabs that the user can use to switch to their preferred view [38]. The tabs are present for all main category pages to maintain consistency, making it easier for users to learn and utilise the interface[22].

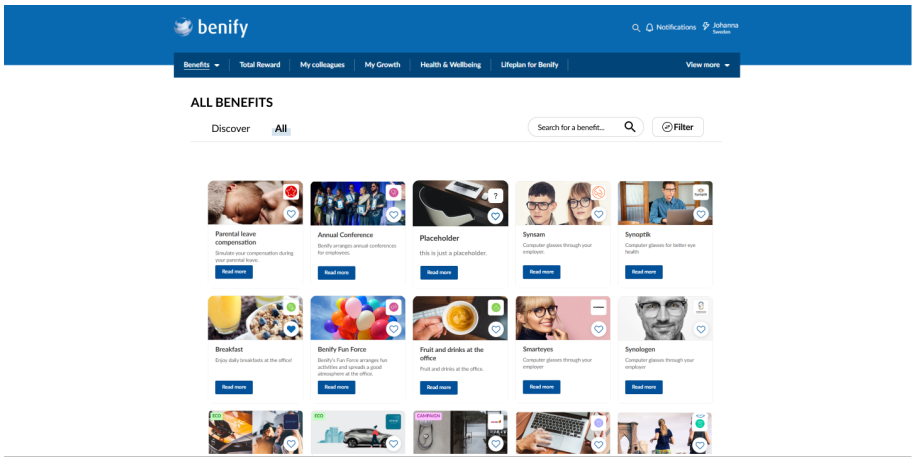

Figure 8.4: Wireframes of the "All" view

On the right side below the header, there is a search bar and a filter button. The search bar is used to search for specific benefits or keywords, and the filter button is used for applying filters when browsing for benefits that meet specific conditions. The colour on the search bar and the filter button was adjusted to increase the contrast and make them more visible. To avoid having two search bars, the search bar at the top of the page was removed and replaced with a search icon.

The filter mechanism has also been changed from four filter options as drop-down lists to a pop-up window where the user can choose amongst smarter filtering options (see Figure 8.5). A search function was added to the list of companies, and a map beside the location filter option. The filters are selectable using checkboxes so that the user can search for multiple options as well as specific ones. To apply the filters the user has to continue using the "Results" button, for the sake of keeping the content consistent and not changing it until the user expects it.

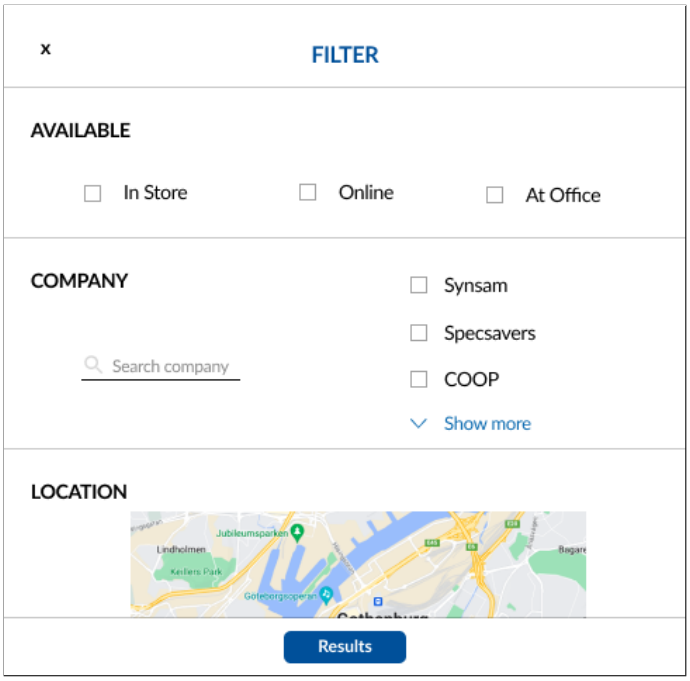

Figure 8.5: The filter pop-up

If the user clicks on a benefit card, an information dialog pop-up appears at the centre of the screen (see Figure 8.6). The dialog has a similar appearance to the cards with a title, an image relating to the benefit, a logo and a favourite button. Additionally, the dialog presents more information about the benefit. If the user wants to read even more about the benefit or go to the specific website, they can click on "Read more", which is a filled button employed for final or unblocking actions in a flow [75]. The benefit cards and pop-up dialogs are designed according to the principle of Disclosure, meaning that only enough information is shown to help users understand what information they will encounter as they explore further[26].

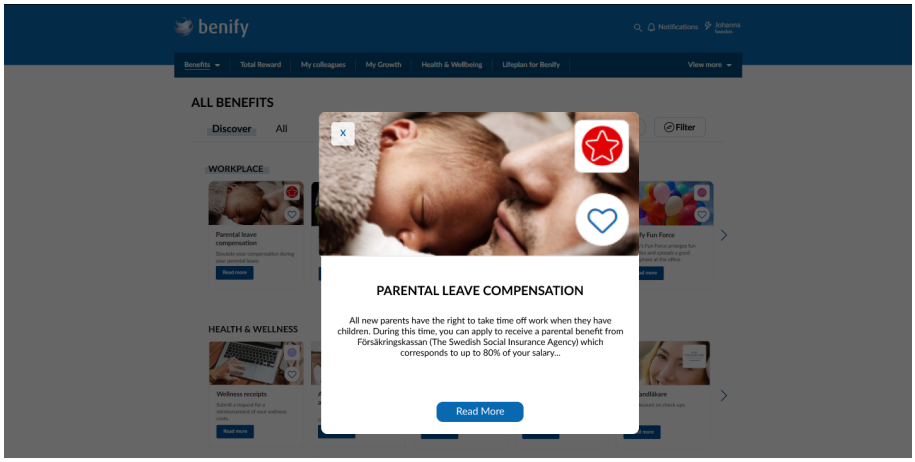

Figure 8.6: The benefit information pop-up

8.3 Navigation Using Keyboard

All elements on the web application should be accessible using the tab key. The intention is for the Web design solution to utilise landmarks with labels so that screen readers efficiently can convey what type of content the user currently is on. For instance, the tabs below the top app bar would be one landmark, which the user can search through using the arrow keys. The tab order goes according to the logical reading order, left to right.

Tabbing through the website would bring the user to each landmark where they can reach the content using the arrow keys. The landmarks would be each header, list, tabs, backward arrow, search bar, filter button and carousel components. All images should have alternative image text and links that will take the user elsewhere should be marked as links.

When selecting the dropdown menu, the user will be directed to the content inside the menu. The user should always be able to get out of an element using the tab to get to an exit button, to ensure they will not get trapped. Hence why all drop-down menus and pop-up dialogs have exit buttons.

8.3.1 Mobile Version

The final design of the mobile version utilises the same bottom app navigation as the current Benify mobile application. When the user navigates to "Benefits", they are brought to a list containing the categories. When a category is chosen in the list of main categories, the list extends downward and displays the subcategories, making it easy for users to see that they can interact with them in alignment with the Visibility design principle[22]. In the list, there is also the option to display all categories or go to benifyDeals, favourites or recently viewed (see Figure 8.7).

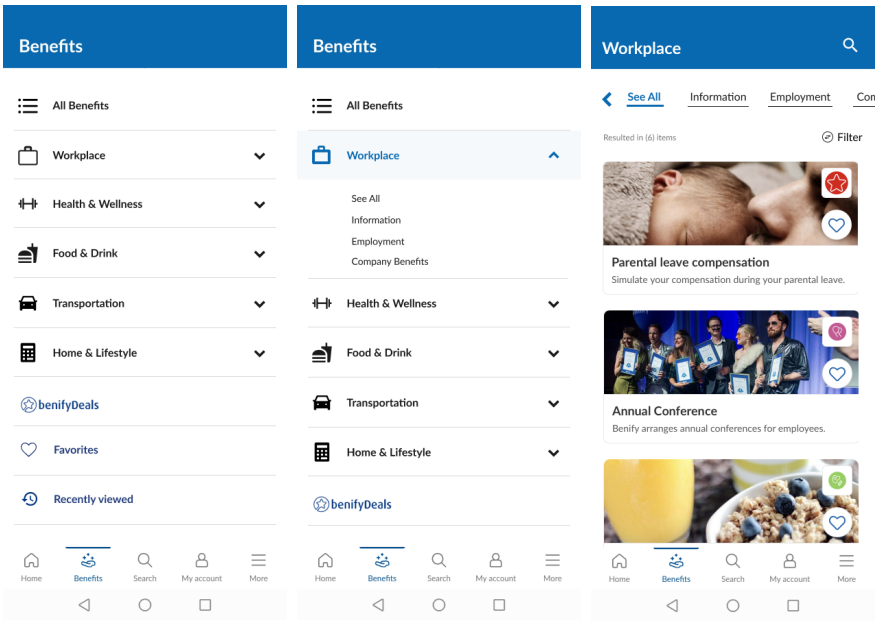

Figure 8.7: Wireframes of the final design of the mobile version

When choosing a category, the user is brought to a view where they can navigate amongst the subcategories using scrollable tab navigation. The scrollable tab navigation was implemented conforming to the Affordances design principle, with an appearance that hints that it is scrollable and can be interacted with [22]. The user can browse the benefits in the chosen category or subcategory and filter the results using the filter button below the tabs to the right. When choosing a benefit, an information pop-up dialog slides up from below and covers the screen, similarly to the Web design.

The benefits are very individual and depending on the amount of information, the user might be presented with a lot of text. To facilitate finding the specific information the user is looking for, it was decided to divide the information using headers that can be extended as a drop-down list, adhering to the Constraints design principle with the intent to guide the user to solely perform necessary actions [22]. Three examples of how a benefit information dialog might look can be seen in Figure 8.8. Similarly to the web version, if the user wants to read more about the benefit or go to the affiliated website, they can click on a link available under "contact and support" to get forwarded there.

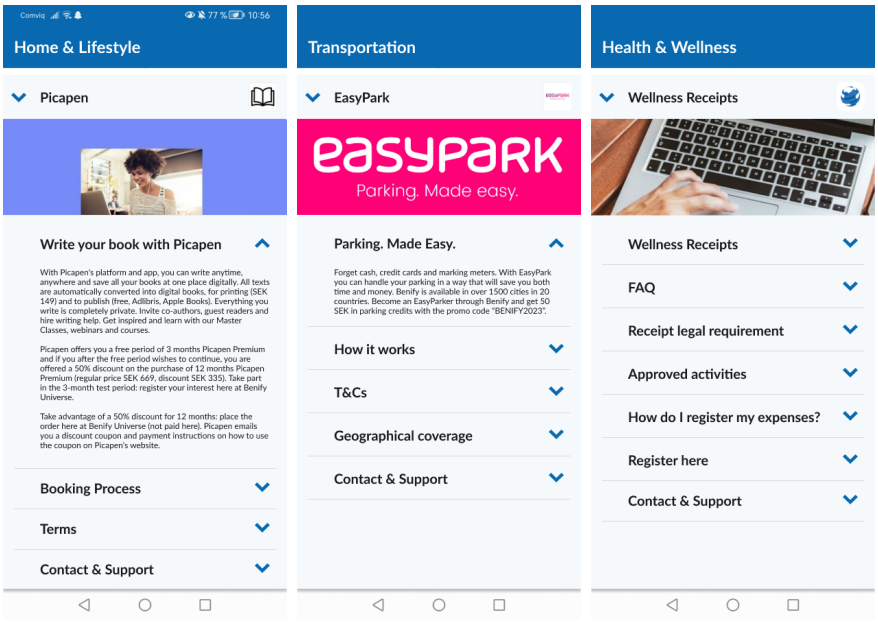

Figure 8.8: Wireframes of the benefit pop-ups on mobile

8.4 Guidelines

This section will present guidelines that have been developed for designing effective categorization and navigation. Providing clear guidelines can help ensure that users can easily locate the information they need and navigate the interface, leading to a better user experience.

The guidelines presented below are derived from the redesign of Benify's platform and aim to serve as a valuable resource for future designers seeking to create effective categorization representations. They are informed by the findings and insights obtained throughout the project and with the goal to provide practical guidance in designing user-friendly and accessible interfaces. These guidelines act as a framework for designers to enhance the categorization experience and improve usability for users interacting with similar platforms in the future.

The presented guidelines stand as a part of the result of this thesis project with the objective to answer the research question *"What should be considered when designing a categorisation interface?"*. The guidelines below are presented in no particular order.

1. **Design for long-term use.** The goal is to ensure repeated user interaction with the product. While there may be a learning curve for first-time users, the design focuses on frequent users. Feedback from the usability test indicates that participants believed they would be able to locate benefits more quickly with repeated tasks, suggesting that users can learn and become familiar with the interface over time. This guideline aims to provide a consistently satisfactory user experience, prioritizing long-term usability and efficiency.

2. **Keep a consistent navigation structure.** To ensure a user-friendly experience and facilitate easy information retrieval, it is essential to maintain a consistent navigation structure across the platform. Incorporating familiar navigation components that adhere to industry standards and recognized guidelines such as WCAG and Material Design enhances user familiarity during initial use [8] [19]. The thematic analysis of the prototypes indicated that participants found the navigation intuitive and easy to navigate due to the recognizable components used in the navigation design.

3. **Ensure that the changes in the interface are communicated through multiple sensory channels.** Using visual cues, such as colour, as the sole means of conveying event changes or relying on images without alternative text can hinder navigation for visually impaired users. To ensure accessibility for a diverse user base, the design should incorporate multiple sensory channels that align with the structure of the application. The issue was identified during the expert interview. The guideline was derived further taking WCAG criteria used in the WCAG check such as "Do not use color alone to convey information" and "Do not make instructions dependent on sensory characteristics" into account [8].

4. **Create a design that supports accessibility tools.** When designing accessible interfaces, it is important to also consider how navigation should function when users depend solely on keyboard-only navigation. Allowing for easier further communication on how it is supposed to work to the developers. According to the expert user, accessibility starts in the design process and in accordance with universal design, accessibility should be integrated from the initial stages of the design process [2].

5. **Provide multiple ways of navigation.** Creating a design solution that accommodates a wide range of users can be complicated. Users have different preferences, navigation styles, and utilization of the interface. If the target users are within a wide range of diverse backgrounds and ages, UX designers might find gratifying users particularly complex. With multiple ways of navigation, users can choose their preferred way to use the system. During the usability test, it was discovered that the participants chose to navigate the applications differently. The guideline was created considering the WCAG criteria "Provide multiple ways for navigating"[8].

6. **Make main categories with a low level of between-category similarity and subcategories with a high level of in-category similarity.** When creating categories, it is recommended to design main categories with a low level of between-category similarity, meaning they should have distinct characteristics and encompass different types of content. On the other hand, subcategories should exhibit a high level of in-category similarity, indicating that they contain closely related content within the same thematic area [29]. This approach helps users easily distinguish between main categories while

providing cohesive and relevant content within each subcategory. Tendencies of this were revealed during the card sort and tree test.

7. **Create categories with a general to specific hierarchy.** A clear categorization system is essential for easy information retrieval and navigation. To achieve this, we recommend organizing categories in a hierarchical structure that starts with basic-level categorization, following the natural and intuitive way humans categorize objects [31]. Using general terms instead of overly specific categories aids navigation and enables users to find information that gradually becomes more specific within the hierarchy. Tendencies of this were seen during the card sort and tree test.

8. **Continuously involve users in the design process to consistently evaluate design with expectations.** Regularly consulting users throughout the design process is essential to ensure the final product aligns closely with user expectations, resulting in a more successful and satisfying user experience. Valuable feedback can be given early in the design process by keeping users actively involved. When users are engaged from the start, their insights can help identify potential usability issues and steer the design direction towards a more intuitive product that is user-friendly. This guideline emerged from insights gathered during the thesis project, which included methods such as persona creation, user journey mapping, and usability testing. By prioritizing user perspectives and incorporating these insights, the guideline offers practical recommendations for enhancing the categorization interface and improving the user experience.

9

Discussion

In this chapter, the research findings and design process are discussed. Limitations of the final design are acknowledged and directions for future development are suggested. The discussion chapter aims to enhance understanding of the outcome and encourage additional discussion on the results.

9.1 Execution and Process

The objective of this thesis is to develop an accessible representation of Benify's categories and deals based on user research and expectations. The user research was conducted through interviews and surveys, ensuring the anonymity of participants. All data collected from interviews and surveys will be deleted upon completion of the thesis. Participants were informed of the voluntary nature of their involvement and had the option to withdraw from the survey or interview at any time.

Additionally, we acknowledge the impact of design on users, including nudging and consumption behaviour. The Benify platform serves as a means to discover benefits, deals, health care allowances, and salary specifications available to employees. Our redesign of categories aims to facilitate easier and faster navigation to these benefits and deals. While it may be argued that this encourages product and service consumption that users may not have previously considered, we have made design choices that do not employ dark patterns to promote excessive consumption.

The study was based on semi-structured interviews which may raise some ethical concerns. There could be a power dynamic between the interviewer and the participants, which could mean that the answers were biased toward more positive responses [76]. A completely natural engagement and reflection from the participant may therefore be difficult to achieve, and this was taken into consideration by us during the analysis of data.

The card sort and tree test were employed to establish the categories, with both methods effectively providing insights into user expectations and mental models. However, participants encountered some confusion regarding the purpose and structure of these methods. Some participants expressed difficulty in understanding the

instructions, finding them somewhat vague and lacking clarity. This confusion was particularly noticeable in the tree test, where a few participants mistakenly selected benefits that were similar or that they believed belonged to the category, rather than finding the specified benefit. This misunderstanding could potentially introduce errors in the results, as not all participants successfully located the designated benefit. To mitigate this, clearer and more explicit instructions should have been provided in advance to ensure a better understanding of the task at hand.

Ethical concerns also include measurement error, considering factors such as survey formatting, completion time, and participant characteristics when analyzing results [77]. The non-response error arises from the fact that not all invited participants choose to participate in the survey. Additionally, confounding effects may exist in the results, as studies suggest that respondents often hold more extreme views on the given subject, being either more negative or positive [76].

Response bias refers to the fact that the given answers by the participant may be more desirable than their actual thoughts in order to help the research [77]. We tried to work against this bias by gathering more objective data in Maze, such as direct success speed and usability tests. This data can not be affected in the same manner as an individual rating scale and may yield more representative data.

9.1.1 The Usability Test

Although much positive feedback for the final design prototypes was given by participants of the usability test, there are aspects of the design that would need more user testing to evaluate. For instance, the "Discover" and "All" tabs were not commented on much during the usability tests. One possible reason this could be because of the way the design was prototyped to not land on the "Discover" tab unless the user entered the all benefits page. Additionally, since the test did not specifically ask the user to use the tabs, the users might have been too busy searching for the benefits to notice them.

Furthermore, some participants commented after the test that they would have liked to have a filter and search function while looking for the benefits despite the fact that those functions are available in the interface, though not implemented to work. A possible explanation for this might be that the participants might not have needed them enough to notice them during the test. Additionally, since they are unable to see the interface after completing the test, they might not have remembered that the functions were present. Further testing on those specific components would be needed to evaluate if the design is satisfactory and useful for the user.

9.2 Categorisation

The categories developed within the scope of this project were derived from a combination of existing research findings and user expectations. By incorporating insights from established research in the field of categorization and user behaviour, we aimed

to align the category structure with established principles and best practices.

User expectations played a vital role in shaping the categories, as they provided valuable insights into how users naturally perceive and categorize benefits in their everyday lives. This user-centric approach allowed us to create categories that resonate with users' mental models and facilitate intuitive navigation within the platform. The combination of research-driven insights and user expectations aimed for a category structure that is both grounded in theoretical foundations and tailored to the specific context of the users, thereby optimizing the overall usability and user experience.

It is advantageous to further explore and implement various scenarios. One such scenario worth considering is the inclusion of benefits that can fit into multiple categories. The existing Benify platform already exemplifies the practice of assigning benefits to multiple categories, which has the benefit of improving discoverability for users. By presenting the benefit in multiple relevant categories, users have a higher likelihood of encountering it during their navigation and exploration of the platform. However, this is something we did not explore further during the scope of this project. We would have liked to further investigate the advantages and disadvantages before addressing this aspect in the final design.

However, in our redesign process, we chose to place each benefit under a single category, as none of the conducted usability tests indicated an explicit expectation from users to find a benefit listed under multiple categories. Nonetheless, it would be an intriguing concept to explore further through usability testing and observe how users perceive and interact with benefits listed in multiple categories. This experimentation could shed light on potential advantages, challenges, and user preferences related to this approach

Additionally, during the card sort and the tree test, we did not ask participants whether they had any visual or other impairments. The tests focused on mental models and expectations to gather insights on how to structure and represent the categories. However, it would have been interesting to investigate whether a visually impaired user would have a different mental model regarding the categories.

9.3 Limitations on the Final Design

As mentioned in the previous section, some aspects would need further testing to make conclusions on how successful the design is for its purpose. However, for this project, the prototyping has been done using Figma and there are limitations on what functions could be prototyped to a degree that could be tested with users. The design is developed for the possible growth of content according to the principle of growth [26]. However, evaluating if the applications are successful when more benefits have been added would be difficult to do at this stage. Furthermore, the product is intended for long-term usage but in this project, it has only been tested with users during initial interaction with the interface. To assess the functionality

and ensure a seamless user experience for expert users, further tests and evaluations need to be conducted over time.

The pop-up menu in the interface design may present some potential challenges, as illustrated by the heuristic evaluation. One potential issue that may arise is related to user confusion or uncertainty regarding how to access the pop-up menu and when it should be used. Since there are alternative routes available to the user, such as directly pressing the "read more" button on the benefit, there is a risk of misunderstanding or overlooking the existence of the pop-up menu. A possible solution to this issue is to present visual cues that guide the user's decision-making process. For instance, incorporating intuitive icons or labels that indicate the availability and purpose of the pop-up menu can help users recognize its functionality. Additionally, providing brief instructions or tooltips upon initial use can clarify the purpose and usage of the pop-up menu, ensuring that users are aware of its presence and how it relates to accessing information.

9.4 Implementation of Accessibility

Due to time limits, we were unable to conduct extensive prototype testing for accessibility purposes. However, despite this constraint, we still aim to offer valuable recommendations regarding navigation based on our design considerations. Our expert was unable to actively participate in the iterative process since the prototype did not support screen readers. Including their expertise in the process would have been highly beneficial in shaping the outcome of our design iterations and accessibility.

However, a continuous recall of our expert interview was present during the design process, and the valuable data regarding navigation with screen readers and expectations of categorisations have had a great effect on the prototypes and we always tried to adhere to these. Furthermore, although we were unable to perform direct testing with screen readers, we have provided recommendations on how individuals utilizing screen readers would approach the prototype and effectively navigate the categories. We would have liked to conduct more interviews with visually impaired users to get more opinions and personal experience regarding navigation structure. However, when reaching out to organisations it was difficult to get respondents that were interested or had time to participate. The aspects of accessibility during this project are based on the expert interview, WCAG and literature. To be able to draw a significant conclusion that the design is adapted for, and meets the needs of visually impaired users, more interviews and user tests would need to be done with more participants with visual impairments.

It was noted that the WCAG guidelines predominantly address coding standards and implementation practices. While we strive to adhere to these guidelines during the design process, we recognize that the full implementation may not be feasible at this stage. However, the prototypes are designed after the WCAG AA-level standards, and although an actual implementation of the guidelines may not be possible, they

are addressed and taken into consideration.

Furthermore, for this project, the main accessibility aspect researched and designed for was visual impairments. WCAG has many requirements that relate to other accessibility needs as well, therefore the final design might have looked different if another accessibility need was chosen, for example, physical or motor impairments.

9.5 Future Work

This section will present areas of further improvement for this project. These suggestions for future work aim to enhance the overall user experience and optimize the effectiveness of the interface design on both applications. This involves iterating on the design based on user feedback, implementing code for accessibility tests, conducting usability tests with a diverse range of users and gathering insights for improvement.

9.5.1 Filter and Search

The Web application specifically would need further iterations and testing regarding positioning for the search bar and how it should be functionally implemented. Furthermore, how to implement a search bar on the "Benefits" page while a higher hierarchy search bar is present on the Web application would need to be explored. The search function has not been changed from the current interface, however, if the placement and functionality is the optimized solution is something that would need to be evaluated. Additionally, we would like to explore other design solutions on how to implement a function that solely searches for benefits rather than content from the whole application.

While a design concept for filtering in the web application has been proposed, it has not yet been implemented in a manner that can be evaluated through user testing. Additionally, the design and implementation of the filtering option for mobile applications need to be developed. By addressing these aspects, the aim is to enhance the usability and effectiveness of the search and filtering functions in both the web and mobile applications. Through iterative design and user testing, the positioning, design, and functionality of these features can be optimized, resulting in a more intuitive and satisfying user experience.

9.5.2 "Discover" and "All"

Based on the findings of the usability test, it was determined that the "Discover" and "All" tabs in the navigation require further attention and improvement. None of the participants utilized these modes of navigation during the usability test sessions, which raises the need for future investigation to understand the underlying reasons behind this behaviour. It is essential to delve deeper into the user perspective and identify any usability issues or conceptual misunderstandings that may have contributed to the underutilization of these navigation modes.

The layout of the interface was inspired by SVT Play, as suggested by the expert from SRF involved in the project. The expert expressed a preference for this particular form of navigation, which influenced the design decisions. Additionally, the concept of offering two distinct modes of navigating the benefits, one organized into subcategories and another allowing users to simply scroll through the content, was deemed appealing by the design team.

In light of these findings and considerations, it would be intriguing to explore whether users would be more inclined to engage with the "Discover" and "All" tabs if alternative labels were used or if the structure of these navigation modes were modified. By introducing alternative labels that better communicate the purpose and functionality of these tabs or by reorganizing the content within these modes, it is possible to enhance user compliance and encourage their usage. This hypothesis could be tested through additional usability testing, allowing for a deeper understanding of user preferences and potential improvements to the navigation experience.

9.5.3 Implement Code

In order to comprehensively assess the design's performance and verify its alignment with our intended design principles, it would be necessary to implement code functionality that enables keyboard-only navigation. This approach aims to cater to users who rely solely on keyboard inputs to navigate the interface, ensuring an inclusive and accessible user experience.

Unfortunately, due to the constraints of this thesis, the implementation of keyboard-only navigation is beyond its scope, as it requires code-level modifications. However, it is important to highlight that during the design phase, careful consideration was given to this aspect, anticipating the future integration of code to accommodate keyboard-only navigation in subsequent iterations.

By acknowledging the significance of keyboard accessibility in the design process, efforts were made to ensure that the interface elements and interactions are designed with this consideration in mind. The goal is to enable seamless navigation and interaction for users who rely on keyboard inputs, promoting usability and inclusivity.

While the implementation of keyboard-only navigation remains a future endeavour, we want to emphasize that an attempt was made to accommodate this feature in subsequent versions where code implementation is feasible. By proactively addressing keyboard accessibility in the design phase, it lays a foundation for future development and optimization, aligning with the broader objective of fostering a more inclusive and user-friendly experience for all users.

9.5.4 Future User Testing

Potential future work for this master's thesis could encompass conducting supplementary user tests with the objective of refining the category structure and ensuring

a comprehensive range of benefits are appropriately sorted within the designated categories. By conducting further user tests, valuable insights can be gathered to evaluate the effectiveness of the category structure in accommodating diverse benefits and meeting users' expectations. This iterative process allows for adjustments and enhancements to be made based on user feedback, resulting in a more refined and user-centric category system. Moreover, the additional user tests can contribute to the validation and robustness of the findings, strengthening the overall research outcomes of the master's thesis.

10

Conclusion

In conclusion, this master thesis was in collaboration with Benify to address the reported challenges users face in navigating the platform's menus for benefits and deals. The objective was to create a new visual representation of categories that enhances navigation and improves the overall user experience while meeting user expectations and adhering to AA-level accessibility based on WCAG guidelines. The research question was: What should be considered when designing a categorisation interface?

Eight guidelines were created to answer the research question and are featured below (See 10.1). By considering these guidelines, designers may hopefully design a categorization representation that prioritizes long-term usability, maintains a consistent navigation structure, ensures accessibility, provides multiple navigation options, and follows a well-organized hierarchy. Moreover, the continuous involvement of users throughout the design process allows for the evaluation of design choices and ensures the final product meets user expectations. Overall, this thesis aimed to provide valuable insights and recommendations for designing a categorization representation, specifically tailored to the redesign of Benify's platform.

The guidelines were based on assessments of user expectations regarding categorization, utilising a card sort and tree test, revealing valuable insights into how users perceive and organize information. To address navigation issues, various design methodologies, including personas, user journey mapping, and flow diagrams, were employed. A WCAG test was performed to ensure that the design meets AA-level accessibility. These methodologies shed light on user needs, visualized navigation paths, and identified potential pain points and challenges. The findings guided the improvements made to the platform's navigation structure, facilitating smoother and more intuitive user interactions. Based on this data, mock-ups and subsequent high-fidelity prototypes were developed.

Usability tests were conducted to evaluate the effectiveness of the prototypes, resulting in the formulation of guidelines for designing a categorization interface that considers user expectations and accessibility guidelines. The guidelines provided on the next page were created to answer the research question and are valuable considerations for creating a user-friendly and accessible interface that meets the diverse

needs of the user base.

Future work in this area could involve design iterations based on user feedback, implementing code-based accessibility tests, conducting usability tests with a diverse user group, and gathering further insights for continuous improvement. By addressing these aspects, the project can further refine the design, ensuring a user-centred and accessible experience. The knowledge gained from this research can contribute to the development of more effective and accessible interfaces.

10.1 Guidelines

1. Design for long-term use.

2. Keep a consistent navigation structure.

3. Ensure that the changes in the interface are communicated through multiple sensory channels.

4. Create a design that supports accessibility tools.

5. Provide multiple ways of navigation.

6. Make main categories with a low level of between-category similarity and subcategories with a high level of in-category similarity.

7. Create categories with a general to specific hierarchy.

8. Continuously involve users in the design process to consistently evaluate design with expectations.

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A

Findings from Literature Review

Universal Design and Accessibility	
A well-implemented universal design goes unnoticed by the user	
Integrates accessibility in early design stages	
Seven principles of universal design could be used to evaluate existing interfaces	(Story, 1998)
An italic text might cause difficulties for users with low vision	
Common issues are regarding, text, frames, tables and interactive components	(Paciello, 2000)
The most common color blindness is red-green	
Include alternative text for images	(Wong, 2011)
Include high contrast to certain color combinations	(Singh & Tandon, 2018)
The design should give an overview of the interface for users with screen readers	
Minimize the amount of speech while providing maximum information	
Screen reader should either provide a description of the entire interface or selected parts tailored to the user	(Evans & Blenkhorn, 2008)

Information Architecture	
Users want access to information as quickly as possible with low effort	
Utilise a card sorting test to gain information about IA	(Babich, 2020)
IA should allow users to only focus on their task and not the structure of the platform	(Rosenfeld & Morville, 2002)
Consider the principles when making design decisions	
Only show enough information that gives users context	
Different layers of the same content should be shown in different locations or categories	
Describe the content of categories by showing examples	
Provide users with multiple methods of classification	
Assume that the amount of content will expand and design for it	(Brown, 2010)

Creating Categories	
Unsupervised categorisation depicts people's naturally created categories	(Pothos & Wills, 2011)
Subcategories have high levels of within-category similarity but low levels of between-category similarities	(Markman & Wisniewski, 1997)
All levels of hierarchy are not equal	
Basic-level categories are learned the easiest and quick recall	(Spencer, 2009)
Categories should go from general to specific	
The most cognitively basic category should be placed in the middle	(Lakoff, 2008)
Use generic words for categories to facilitate navigation	(Rosch et al., 1976)

B

Placement of benefits based on card sort

The benefit and its previous placement on Benify's platform, compared to the proposed placement from respondents to the card sort.

Benefit	**Current Placement**	**Card Sort**
City Gross, 150 SEK discount on recipe bags	Home & Leisure	Food & Drink (14)
Cleanflat, house cleaning with 20% discount	Home & Leisure	Services (13)
CMORE, 25% discount on selected subscriptions	Home & Leisure	Entertainment (10)
Computer glasses, recieve computer glasses through your employer	At Work	Workplace (12)
Enjoy daily breakfast at the office	At Work	Workplace (12)
Espresso House, 20% discount	Home & Leisure	Food & Drink (18)
Filmstaden, movie tickets for 109 SEK	benifyDeals	Entertainment (15)
Find information about your company car	At Work	Workplace (13)

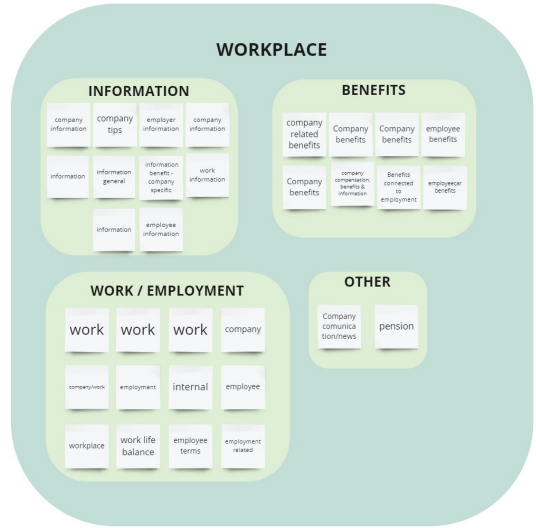
Benefit	**Current Placement**	**Card Sort**
Flexmassage, up to 20% discount on massage	Wellness	Health & Wellness (21)
Gymmet, information about your local fitness centres	Wellness	Health & Wellness (19)
Hälsoresurs, buy a massage now	Wellness	Health & Wellness (23)
Happident, up to 50% discount on dental care	Healthcare	Health & Wellness (15)
Hello Fresh, save up to 1549 SEK on recipe bags	benifyDeals	Food & Drink (15)
Idre Fjäll, skipass	Wellness	Health & Wellness (10)
Information about your leave of absence	Employment Benefits	Workplace (13)
Johan & Nyström, 20% discount on coffee and tea	Home & Leisure	Food & Drink (17)
Join a sport club at your company	Healthcare	Workplace (12)
Lexly, order legal advice	Home & Leisure	Workplace (6)
Mathem, 5% discount on your grocery order	Home & Leisure	Food & Drink (15)
MEDS, up to 20% off	benifyDeals	Health & Wellness (13)
Nanny.nu, babysitting with 10-15% discount	Home & Leisure	Services (13)

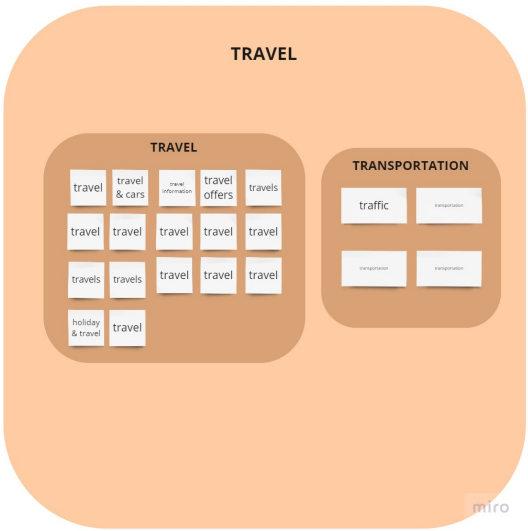
Benefit	**Current Placement**	**Card Sort**
OKQ8, buy car charging boxes to a discounted price	Home & Leisure	Transportation (10)
Parental Leave, calculate your compensation during your parental leave	At Work	Workplace (12)
Pension School, learn more about your pension, get tips and more	Pension & Insurance	Workplace (10)
SATS, discounts on gym, group training and online training	Wellness	Health & Wellness (20)
Shape4Life, health, diet and training advice	Wellness	Health & Wellness (21)
SL, monthly payment of your travel card	Transportation	Transportation (13)
Sonos, 15% discount on Sonos products	benifyDeals	Electronics (7)
Sturebadet, swimming, gym and fitness classes	Wellness	Health & Wellness (22)
Travel at work, up to 10% discount on communal traffic	Transportation	Transportation (9)
View approved wellness activities through your company	Health & Wellness	Workplace (12)
Volunteering, get involved to help future generations	Employment Benefits	Other (6)
Wellness Receipts, submit a request for a reimbursement of your wellness costs	Health & Wellness	Health & Wellness (15)

C

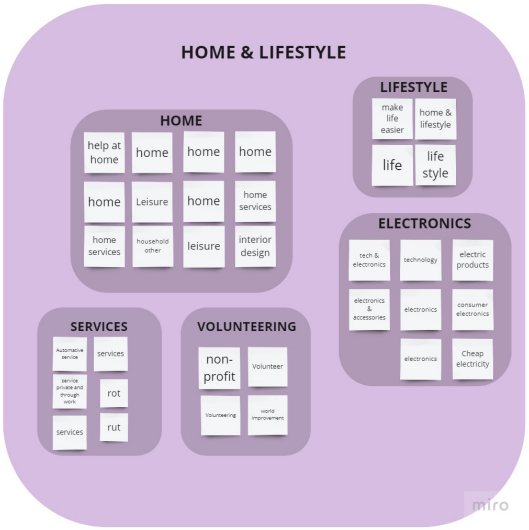
Affinity diagram for new proposed categories

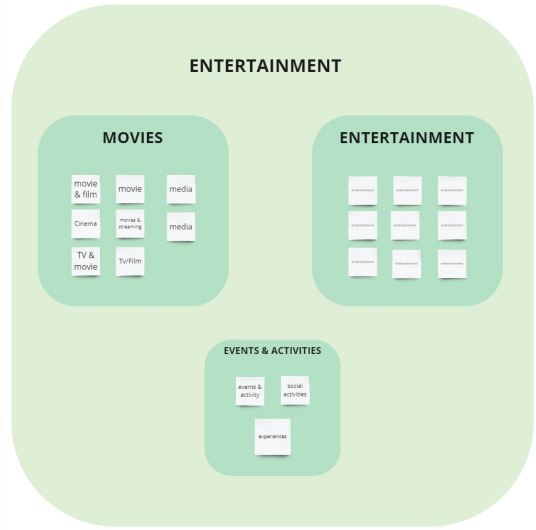
The new labels for main and subcategories, sorted based on name and content.

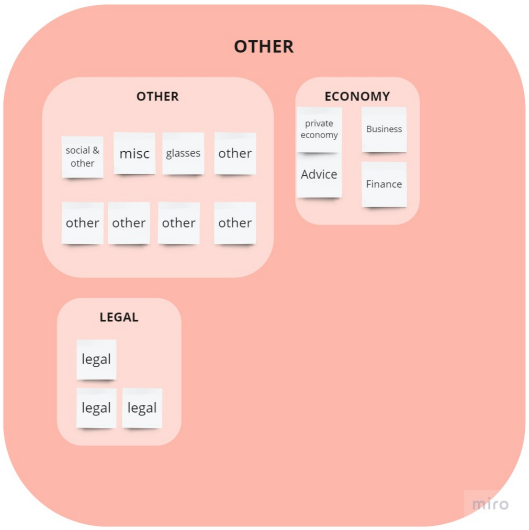





DISCOUNTS
outstanding deals
deals with salary deductions
free stuff
orderable benefits
shopping
saving some kind of money
deals with offer codes
discounts
discounts
interesting offers
discount
discount
discounts
discounts
other discounts


HOME & LIFESTYLE
HOME
help at home
home
home
home
home
Leisure
home
home services
home services
household other
leisure
interior design
LIFESTYLE
make life easier
home & lifestyle
life
life style
ELECTRONICS
tech & electronics
technology
electric products
electronics & accessories
electronics
consumer electronics
electronics
Cheap electricity
SERVICES
Automative service
services
service private and through work
rot
services
rut
VOLUNTEERING
non-profit
Volunteer
Volunteering
world improvement
miro


ENTERTAINMENT
MOVIES
movie & film
movie
media
Cinema
movies & streaming
media
TV & movie
TV/Film
ENTERTAINMENT
EVENTS & ACTIVITIES
events & activity
social activities
experiences


OTHER
OTHER
social & other
misc
glasses
other
other
other
other
other
ECONOMY
private economy
Business
Advice
Finance
LEGAL
legal
legal
legal
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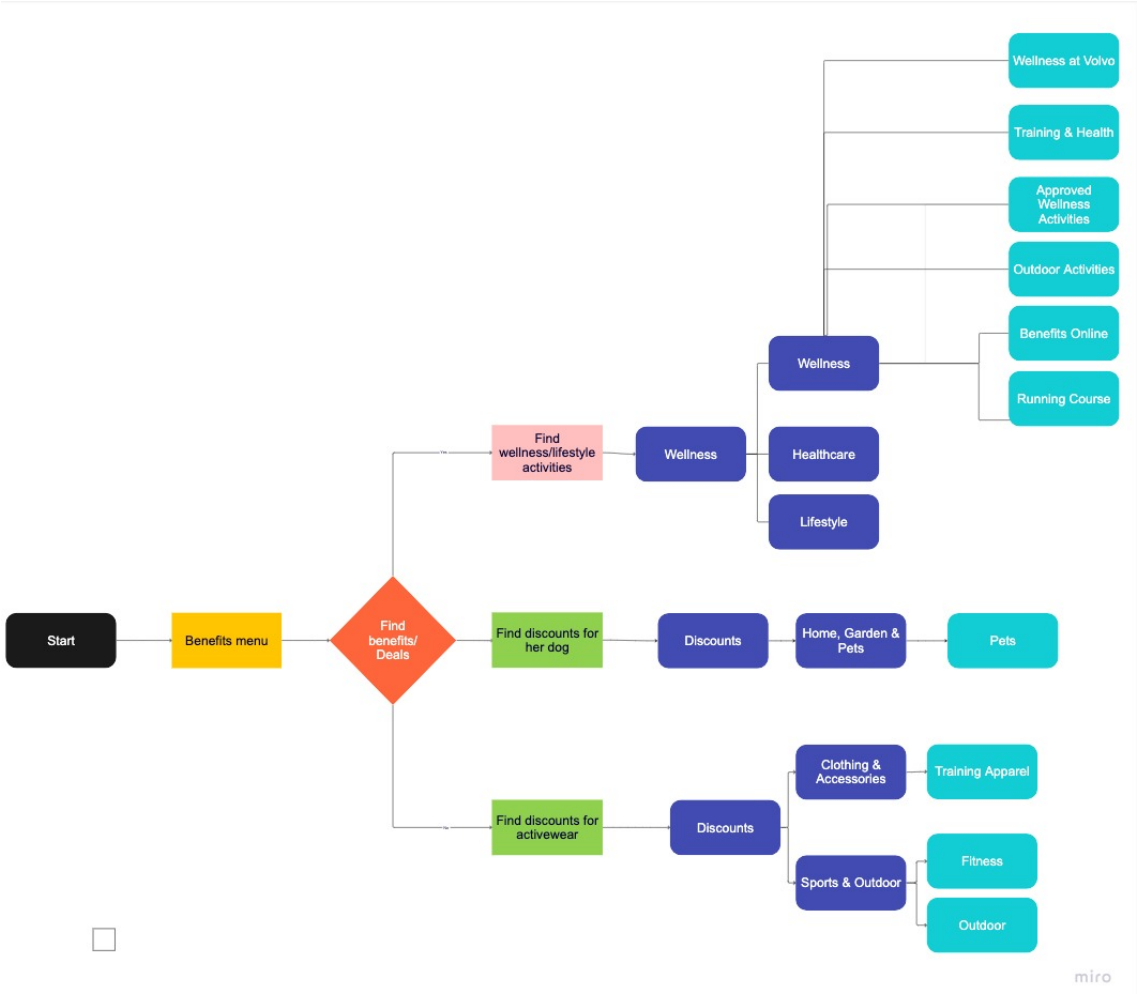
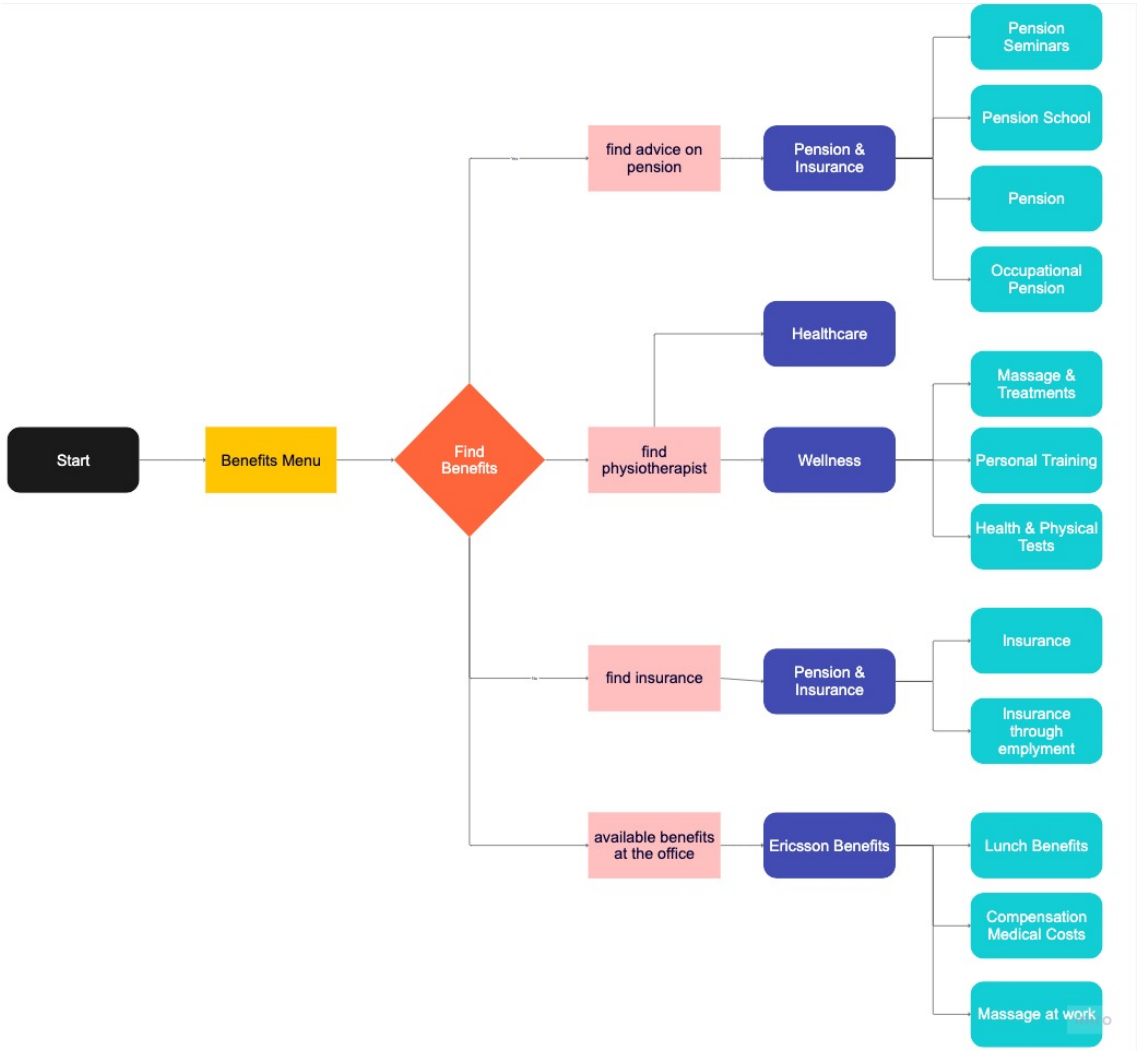
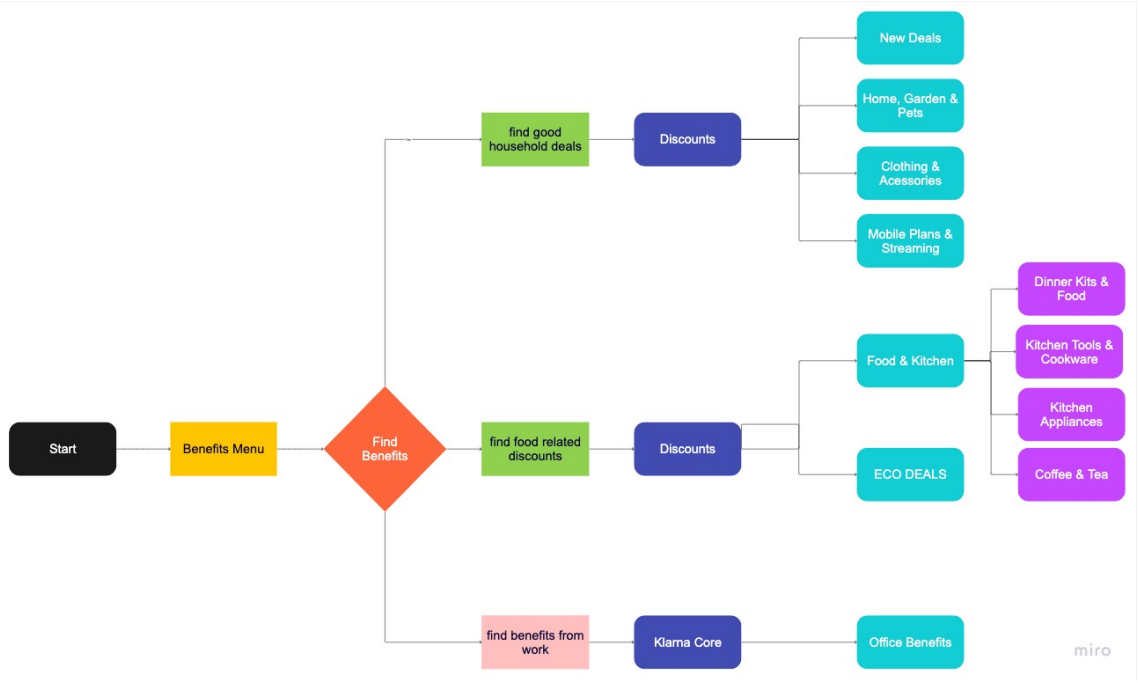
D

User Flow Diagram

User flow diagrams presented in order of persona: Katarina, Bob and Rose.




Start
Benefits Menu
Find Benefits
find advice on pension
Pension & Insurance
Pension Seminars
Pension School
Pension
Occupational Pension
find physiotherapist
Healthcare
Wellness
Massage & Treatments
Personal Training
Health & Physical Tests
find insurance
Pension & Insurance
Insurance
Insurance through emplyment
available benefits at the office
Ericsson Benefits
Lunch Benefits
Compensation Medical Costs
Massage at work


Start
Benefits Menu
Find Benefits
find good household deals
Discounts
New Deals
Home, Garden & Pets
Clothing & Acessories
Mobile Plans & Streaming
find food related discounts
Discounts
Food & Kitchen
Dinner Kits & Food
Kitchen Tools & Cookware
Kitchen Appliances
Coffee & Tea
ECO DEALS
find benefits from work
Klarna Core
Office Benefits
miro

E

WCAG Testing

The results after comparing the high-fidelity prototype to the WCAG AA-level criteria are presented below. The results are divided into *Passed* or *Partially Passed*, the former being if the criteria explicitly are depicted in the prototype, whereas the latter is criteria that are based on code. Criteria that are based on code, are only partially passed as they are designed for in the prototype, but can not be accurately assessed during this thesis.

Criteria	Test Result	Motivation
1.3.2 (A) Present the content in a meaningful order	Passed	.
1.3.3 (A) Do not make instructions dependent on sensory characteristics	Passed	
1.4.1 (A) Do not use color alone to convey information	Passed	
1.4.3 (AA) Use sufficient contrast between text and background	Partially passed	This has not been implemented since this is a code-based criterion.
1.4.4 (AA) Resize of text	Partially passed	The interface will need further iterations on how it should look on different screen sizes.

Criteria	Test Result	Motivation
1.4.5 (AA) Do not use images of text to present text	Passed	
1.4.10 (AA) Create a flexible layout that works on magnification or small screen	Partially passed	The layout has been designed solely for standard Web application and mobile dimensions and has not been configured for in-between measurements.
1.4.11 (AA) Non-text contrast	Passed	
2.3.1 (A) Flashing content	Passed	
2.4.2 (A) Use titles that describe topic or purpose	Passed	
2.4.5 (AA) Provide multiple ways for navigating	Passed	
2.4.6 (AA) Have descriptive and clear headings and titles	Partially passed	"Discover" tab could use further iteration if the title represents the content
3.2.1 (A) Do not perform any unexpected changes when focus	Passed	

Criteria	Test Result	Motivation
3.2.2 (A) Do not perform any unexpected changes when input	Passed	
3.2.3 (AA) Be consistent in navigation, structure, and layout	Passed	
3.3.2 (A) Provide labels or instructions when content requires user input	Passed	

F

Thematic Analysis

WEB

- Open navigation, could easily navigate
- Difficulty navigating to the drop down menu
- A bit more noice on the web (more pictures around the screen compared to a small menu)
- Difficulty navigation web with the small text font

MOBILE

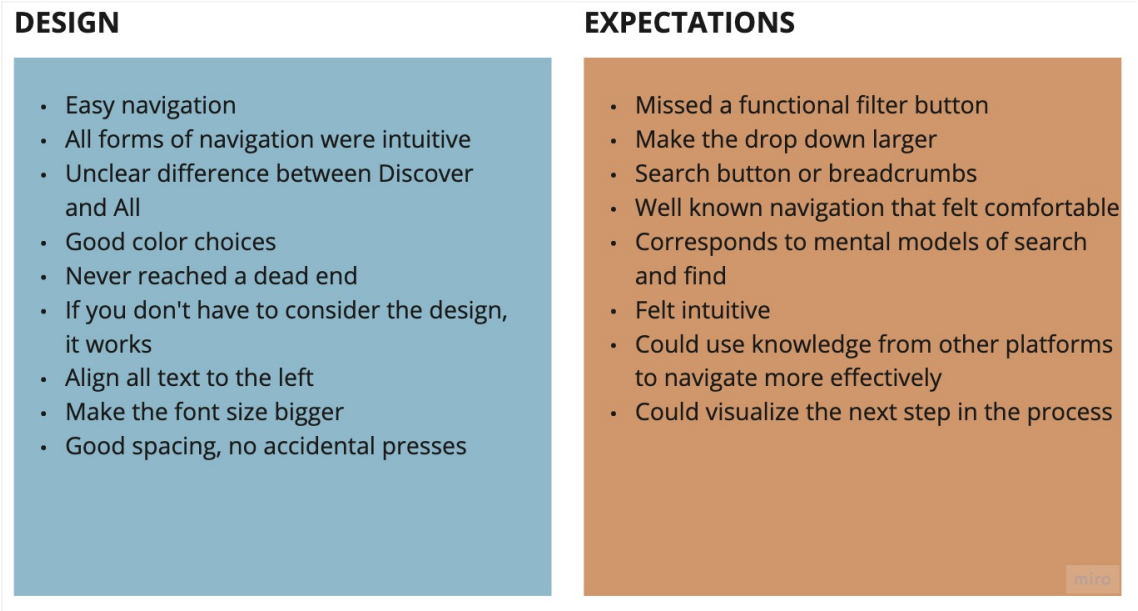
- Easier than web
- Everything on mobile was necessary
- It is often more cluttered on web, the adaptation to mobile was well executed
- Use apps more often and is thereafter more used to that style of interface
- Quicker navigation
- Uses app for specific searcher

COMPONENTS

- Well-known modern menu choices on desktop
- Could make the drop down menu larger to include more components (search)
- As soon as you locate right category you can find right benefit
- See All facilitates navigation
- Get a preview of what the categories include
- Align text of subcategories to the left
- Include possibility to search on mobile
- Make the filter icon more prominent
- User friendly font size when selecting category

EXPERIENCE

- Unclear top bar navigation on web
- Some adjustment period to understand task
- Could use more feedback when selecting subcategory on mobile
- Picapen was difficult, wanted to search for it
- Web and Mobile were similar
- Interface was clean and simple
- Small text
- Easy to navigate and press correct benefit


DESIGN
Easy navigation
All forms of navigation were intuitive
Unclear difference between Discover and All
Good color choices
Never reached a dead end
If you don't have to consider the design, it works
Align all text to the left
Make the font size bigger
Good spacing, no accidental presses
EXPECTATIONS
Missed a functional filter button
Make the drop down larger
Search button or breadcrumbs
Well known navigation that felt comfortable
Corresponds to mental models of search and find
Felt intuitive
Could use knowledge from other platforms to navigate more effectively
Could visualize the next step in the process
miro