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User Onboarding Experience

Increasing users' perceived motivation of engaging more with a product

Master's thesis in Interaction design and technologies

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Abstract

This thesis has explored the concept of user onboarding, which is the process of converting first-time visitors into long-term users by introducing them to a new product or service. The aim of this study was to investigate how an improved onboarding experience, based on extensive user research, can increase users' motivation to visit a platform more frequently, using the HR-company Benify as a case study. To accomplish this, a design process was formulated based on the Human-Centered Design, Goal-Directed Design, and Participatory Design frameworks, which extensively integrated quantitative and qualitative research methods to increase research validity. To address the problem statement and research questions, an onboarding experience was designed based on a number of principles from established onboarding strategies, as well as behavior theories on human motivation, and was later experimentally tested through an A/B test. The results from the A/B testing showed no statistically significant difference between the company's current onboarding design and the new onboarding design variation, although some results suggested that the latter variation was slightly superior to the company's current design variation. The assessment of the results was that both the execution of the A/B test and the qualitative research methods experienced several flaws that need to be improved for future iterations, and that the root cause of infrequent visits to the platform may not be related to the onboarding experience for this specific instance. Conducting more extensive qualitative user research to better establish the users key activation moments and main challenges, as well as redesigning the A/B testing to improve the measure of the dependent variables, could potentially improve the outcome of the work.

Keywords: computer science, project, thesis, interaction design, ux design, user experience, HCI, user onboarding

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1

Introduction

As the number of software applications have dramatically increased, the market competition has become higher as well. This denotes the importance of creating high quality softwares and applications through applying a Human-Computer Interaction approach to secure user retention. The fundamental concern of Human-Computer Interaction research is to understand how systems and softwares can be designed to increase usability, functionality, and learnability. Designs that follow Human-Computer Interaction design principles are thought to increase user success, user satisfaction, as well as user engagement [7]. The features of humans, which are crucial agents for interaction, such as behavioral, cognitive, perceptual, efficiency, and physical variables, must therefore be considered during the design phases of software projects [7].

Although well designed system that follow established design principles can increase likelihood of success, it is crucial to emphasize the importance of the first interaction a user has with a system. The first experience a user gets with a website has a significant impact on the impression they acquire from the site and can influence any subsequent decisions regarding the site's use [50] [79]. According to Jakob Nielsen [59], consumers typically abandon a web page after 10-20 seconds, indicating that they are impatient online and further implies the importance of a good first impression. In Hirshleifer and colleagues work [40], negative initial impressions have a greater impact than positive ones, which is consistent with negativity bias. As Strahm and colleagues argue [74], less than 25 percent of new users never return to an application after their first use. This denotes how critical it is to welcome users with an effective onboarding experience.

Designing a well-functioning onboarding is crucial as it is the first and only interaction that every user experiences [74]. Moreover, learnability is a central topic in Human-Computer Interaction research, which is considered to be an essential factor for securing success and user satisfaction [7]. Although onboarding lacks a consensual definition, it consists of a sequence of steps that introduces users to a new product or service [11]. According to Marina Cardoso [12], user onboarding is a conceptual process of turning first-time visitors into long-term users, communicating how the technology works, establishing its' value to the user, and scaffolding the first experience by providing a sense of direction towards a predetermined goal. Samuel Hulick [41] defines user onboarding as *"the phase a customer goes through in between making the decision they want to use a product and being a fully satisfied customer extracting lots of value from the product"*. However, more research on on-

boarding is needed to gain a better understanding of what fundamental components are required to retain users and enhance conversion rates.

This research is done together with Benify, a large HR-company in Europe with over 2 million users in 45 different countries. The company provides a web portal where employers can offer their employees salary benefits and wellness contributions. Benify need a better understanding of who their users are, and how their characteristics, goals, needs and challenges may differ from one another. It has been noticed that many users visit their platform only a few times a year, which is below the desired usage rate, but there is currently not enough knowledge to manage this issue. A proficient strategy for introducing new users to an application or website, with the goal of user retention and long-term engagement, is by implementing a good user onboarding process [78]. When managing a platform to aid this vast number of users it is challenging to satisfy everyone's needs and expectations. Benify need help in conducting rigorous user research and analysis, in order to find patterns of usage and draw insightful conclusions about the user groups. The aim of this research is to investigate whether better user knowledge through user research and improvements to their onboarding experience, potentially including tailored solutions, can increase the user engagement. Based on the collected knowledge, the thesis also aims to provide guidelines on what design strategies should be considered when designing a successful onboarding experience.

As this research will investigate how an onboarding process can increase users motivation of returning to a digital platform, a literature review on onboarding frameworks as well as behavior theories regarding human motivation will be conducted. In order to aid the development of an onboarding process for Benify's platform, a customized design process incorporating aspects from Human-Centered Design, Goal-Directed Design, and Participatory Design will be utilized. Both qualitative and quantitative research approaches will be employed to collect and analyze user data. Iterative prototyping, A/B testing, and heuristic evaluation of the prototype will be used to evaluate the design and its impact on participants' perceived motivation to engage with the platform.

1.1 Aim

The assignment for this research is to suggest improvements to Benify's user onboarding experience based on rigorous user research, in order to investigate whether it can have an impact on users motivation of engaging more with the platform. As any successful onboarding experience requires solid knowledge about the users, conducting user research through qualitative and quantitative methods will be a major part of this thesis. Based on this, the research question for this thesis is:

- What design strategies should be considered when developing an onboarding experience, in order to raise users perceived motivation of interacting more with a product?

1.2 Limitations

Benify has over 2 million users, but due to a limitation of resources, the research is based on a limited number of users. Therefore, conclusions on a large group of users will be based on results from a few. Moreover, Benify has both end users and expert users. For this project only end users will be designed for. Additionally, this thesis will concentrate on people in Sweden for the following reasons:

- The range on Benify's platform varies based on geographical location. To ensure that disparities in range do not effect participants, focusing solely on Swedish users was selected, which lowers supply discrepancies across users.
- Benify's collected data about Swedish users is the most detailed and extensive. Data collected by Benify on users in other countries is comparatively limited.
- Interacting with and interviewing Swedish users was facilitated through Benify's support in connecting us with Swedish users. Due to time constraints, this was deemed the best alternative for this study.

This research involves user research, prototyping, and usability testing. However, a final implementation will not be executed. Additionally, this project exclusively focuses on the onboarding experience inside the platform. Thus, onboarding elements such as newsletters and notifications that are communicated outside of the platform will not be designed.

Benify's platform can be accessed from several devices. The design variation which will be developed through this research will however be limited to one device, which will be determined based on the knowledge obtained by the user research.

User retention and engagement needs to be measured over a long period of time. For this thesis, no such measurements will be used. Only participants perceived motivation of engaging more with the platform will be measured.

One of the seven interviewees conducted the interview in his or her second language. Not being able to completely express oneself due to not speaking one's first language may have skewed the data.

2

Theory

As the aim of this study is to investigate how an onboarding experience can be designed to increase users' motivation of returning to an application, a literature review on Human-Computer Interaction, behavior theories, and onboarding strategies has been conducted. Hence, this section will introduce the field of Human-Computer Interaction (HCI), behavior theories in HCI concerning engagement and motivation, and finally onboarding strategies and frameworks relevant to this study.

2.1 Human-Computer Interaction

According to Akcayol and Calp [7], the software industry is quickly developing. To cope with the increased competition caused by this expansion, software projects must be of higher quality and more user friendly. As a result, the value of Human-Computer Interaction becomes clear. In this section, the research field of Human-Computer Interaction (HCI) is presented. This section is devoted to understanding what HCI is and how HCI design principles should be applied when designing a software, in order to secure usability, functionality, and a high user experience, and possibly increase user motivation for engagement as a result.

2.1.1 Definition of Human-Computer Interaction

HCI is a field that studies the design, evaluation, and implementation of interactive computing systems for human use, as well as the major phenomena that surround them. The significance of HCI stems from the fact that most sophisticated machines are useless unless they can be used correctly by humans [70]. HCI aims to understand how interfaces can be designed in order to increase user efficiency and user satisfaction, and a common belief is that softwares that follow HCI design principles become more successful, user-friendly, and higher quality [7]. Thereby, a success metric of technology according to HCI practitioners is how easy users can interact with it, where poorly designed interfaces that are hard to use are likely to be ignored or abandoned by users [54]. HCI can be found at the intersection where social and behavioral sciences meet computer and information technology [10]. By integrating knowledge from computer science, human factors engineering, and cognitive science (see Figure 2.1), HCI is considered a multidisciplinary field [30].

According to Carroll [10], HCI practice aims to understand how humans utilize and apply devices and embedded computational systems, and ways to improve the util-

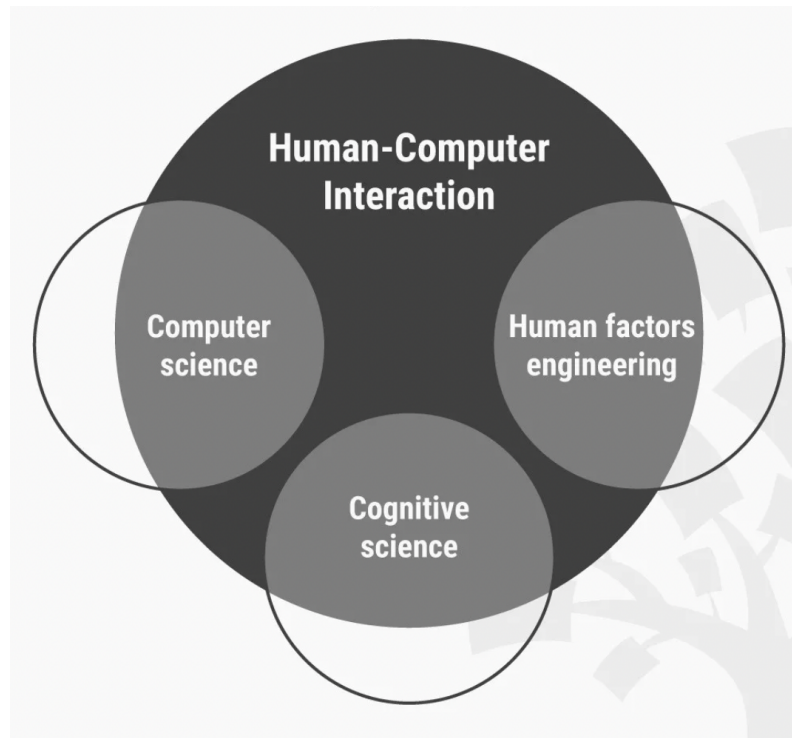


Figure 2.1: The Multidisciplinary Field of HCI [30]

ity and usability of such devices. Preece et al [44] state that HCI *"is concerned with the design of computer systems that are safe, efficient, easy, and enjoyable to use as well as functional"*. It is imperative to integrate HCI throughout the whole development process in order to produce effective results. An attractive interface does not make a well designed system. Rather, a useful interface must be developed integrally with the whole system. Beyond presenting an aesthetically pleasing front, a product should above all support users tasks and goals, and forgive and prevent errors [44].

To cite Diaper [19], *"the study of HCI has become the study of usability"*. Veritably, two central terms to HCI are functionality and usability. Functionality refers to whether a design works and assists users in meeting their goals and needs. Usability is a quality attribute that measures how simple a user interface is to use [70]. ISO [7] defines usability as *"users' state of effectiveness, efficiency and satisfaction about a developed system to achieve certain goals in a certain environment"*. Nielsen [7] defines usability as a combination of factors which together influence peoples interaction with and perceptions of a product or system. The main factors that are being considered are learnability, efficiency, rememberability, low error rate, and satisfaction of use. In short, usability and functionality is concerned with appropriately designing products for user's expectations and needs, in order to increase the effectivity, efficiency, and degree of satisfaction of a product or service. Moreover, usability is highly concerned with learnability, based on the notion that it increases and facilitates ease of use and user satisfaction [7].

Recently, a new perspective on HCI has been introduced which beyond usability also highlights a products non-instrumental value. User experience (UX) is a phenomenon which stems from HCI, which other than acknowledging a products instrumental and pragmatic value also studies a products affective values, such as hedonism, aesthetics, desire, emotions, and experientiality (see Figure 2.2). UX denotes the importance of designing for the experience, more specifically joyful and positive experiences. In a sense, UX is a form of positive HCI, which other than solely focusing on hindering usability problems, also aims towards creating excellent quality experiences [37]. Thus, UX is all about the idea of designing for pleasure rather than solely for the absence of pain.

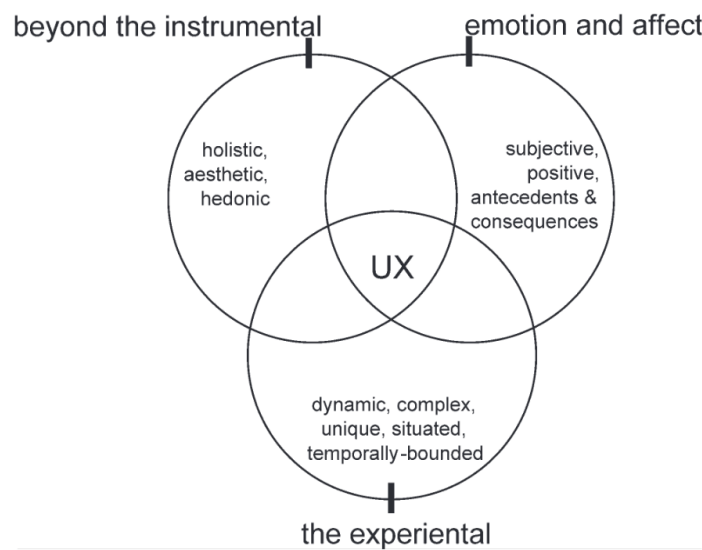


Figure 2.2: Facets of UX [37]

2.1.2 Design principles in Human-Computer Interaction

Numerous design principles and laws exist in the field of HCI as a result of the accumulation of wisdom and knowledge of researchers and practitioners in the field. Design principles are fundamental design advice that can be used to achieve HCI and UX goals, by explaining how to create easy-to-use, pleasurable, appealing and effective designs [26]. Although a vast number of HCI design principles exist, no single set of consensus has been reached thus far [39]. Some examples of recognized and widely used sets of design principles are Jakob Nielsen’s 10 most fundamental usability heuristics [61], Alan Coopers usability principles for interface design [15], and Schneiderman’s eight golden rules for interface design [23]. Although they vary to some extent, they all share common denominators. Firstly, all methods are highly centered around creating design implementations which follow user’s mental models. Moreover, many of the usability principles are developed to scaffold users locus of control, elimination of navigational excise, minimize the the load of short-term

memory, and reduce users' cognitive load. Finally, all methods provide dispense meaningful assistance to support interface design problems and can be used as evaluation methods to assess improvements to an interface or system based on standard usability principles [61] [15] [23] [36]. As it becomes apparent that the reduction of cognitive load and following users' mental models are two highly fundamental and frequently mentioned HCI design principles [61] [15] [23], this subsection will present two sets of recognized design principles that have been formulated to support these standards.

2.1.2.1 Hick's Law

In the field of UX, reducing the users' cognitive load is considered a fundamental requirement [26]. Furthermore, one core tenet of HCI is designing softwares that are easy to use [54] [39] [70]. Hick's law is an example of a psychological principle widely used in the field of HCI related to user engagement, which addresses the importance of designing softwares with simplicity and user support as a goal. Hick's Law states that the time it takes to make a decision increases with the number and complexity of choices. Users that are presented with multiple choices need more time to decide and are given unwanted tasks [66]. Nielsen [57] states that one of the key decisions in designing any user interface is concerning the trade off between the number of features and simplicity. Engaged users can operate more features, but most users have low commitment. Moreover, studies have shown that users do not want to spend time learning a new product by reading instructions or manuals. Rather, they want to learn by using the product [46]. In conclusion, Hick's Law can be used as an argument to emphasize the importance of designing goal-specific, simple and supportive systems, as such systems can support the reduction of cognitive load of its' users and thereby increase user retention.

2.1.2.2 Eight most fundamental usability principles

According to some researchers, the HCI field is experiencing fragmentation as it lacks a consistent set of principles that has reached consensus among all [10] [39]. Hinze-Hoare [39] conducted a survey of the HCI literature based on citation frequency and authorship in order to identify the most fundamental HCI principles. The eight most fundamental principles that could be identified were the following:

1. Recoverability: the ability of users to recover from errors
2. Familiarity: the degree to which users personal experiences and knowledge is used as a reference when designing systems
3. Consistency: the degree of similar behavior emerging from similar situations or task objectives
4. Substitutivity: the users ability to enter the same values, or carrying out similar actions in different ways according to their own preference
5. Task Migratability: the transfer of control between the users and the system regarding task execution
6. Synthesisability: the ability of the interface to enable the user to establish anticipating mental models of how the system operates

7. Predictability: the extent the user is supported in anticipating the effect of future actions based on knowledge from past system interactions
8. Perceptual Ergonomics: designing feedback and information which is accessible and adapted to human perception

The findings reveal that many of the principles identified by Hinze-Hoare [39] support the design of systems based on users' mental models. Mental models are internal representations that people have of themselves or the objects they interact with, which support the prediction and explanation of interactions. Additionally, mental models can explain how people understand certain knowledge domains [71]. Thus, highly usable systems acknowledge and adhere to the way in which humans make sense of information problems and anticipate interaction and outcomes. Furthermore, the findings emphasize the need for symbiosis and synergy between humans and systems, where both harmoniously transfer control and responsibility in task execution to enhance user success. As according to Hick's Law, well designed systems must consider the trade-off between user control and constraints in order to increase simplicity and success [66]. Taken together, all of the presented principles highly support the reduction of users' cognitive load and design implementations which accurately situate interaction in human cognition and sensemaking.

2.2 Behavior theories and motivation

As mentioned, HCI resides at the intersection between social and behavioral sciences, and computer and informational technology [10]. Thus, HCI practitioners are progressively designing softwares which aim to promote change in the behavior of its' users [38]. Moreover, HCI is highly concerned with mental models of humans, advocating that well designed systems must follow the internal mental constructs of its' users [39]. Consequently, HCI research and practice frequently utilizes behavior theories to inform design decisions of systems [38]. At highest level of behavior theories are meta-models, which describe a number of models within a single structure. These include for example the social ecological model, which identify high level interconnected associations and factors of behavioral influence [38]. At a lower level are conceptual models, which center around one or two levels of influence and supply with a more specific report of how constructs are interconnected [65]. Among these theories are the transtheoretical model, the theory of planned behavior, the self-efficacy theory, and the self-determination theory [38]. At the final level are constructs, which refer to the most fundamental causes and mechanisms that are thought to influence behavior. The social cognitive theory is an example of such a theory, which provides a comprehensive definition of self-efficacy [5]. To understand how human behavior can be influenced by technology and establish design strategies that can increase user motivation, this section will discuss selected theories regarding human behavior and motivation that have been frequently cited in and used in HCI literature and practice.

2.2.1 Fogg Behavior Model

BJ Fogg has developed the Fogg Behavioral Model (FBM) to better understand human behavior. The model consists of three factors that together compose behavior: motivation, ability and triggers. FBM can be used in HCI research and practice as a theoretical framework for persuasive technology. It can be used as a tool that can help understand what factors motivate users to engage with technology [25].

According to FBM [25], humans have three main motivations: 1. humans seek pleasure and try to avoid pain, 2. humans hope for something good and fear something bad, and 3. humans want to be accepted by other humans and do not want to be rejected. The second factor, ability, means that a person has to be able to take an action. Fogg underlines that people are lazy and do not want to put in extra effort, so ability and exercise should not be confused. Instead, he uses the term "elements of simplicity" as a synonym for ability, as simplicity is a way to improve ability. Thus, in order to increase the ability of users, designers should increase the simplicity of softwares. The final factor triggers, refers to activation of action or behavior. According to the theory, behavior occurs when a person is triggered at the same time that he or she has the necessary abilities and is sufficiently motivated (see Figure 2.3). In the absence of triggers, behavior will not occur. Triggers can be both internal and external. Internal triggers are associated with habits, thoughts, and emotions. External triggers are within the person's environment, such as word of mouth, notifications, and advertising; they represent an outside influence telling the person what to do. Timing is critical for both triggers, as it seizes the opportune moment of putting people above the behavior and activation threshold [25].

Eyal [22] proposes a model that uses simplicity to increase ability. The first step should be to understand why a person needs to use a service. As a result, all steps the user should take to achieve this goal should be detailed, and any that are unnecessary should be removed. The simplest procedure will be found in this way. This can be seen as a way of eliminating navigational excise, an important design principle according to the literature [15]. Reducing navigational excise refers to reducing the amount of steps a user needs to take to reach their goal. Moreover, Fogg believes that so-called "baby steps" are a powerful tool for building people's confidence and ability to create behavior in the long run. People do not need as much motivation to start small, and making things appear doable can increase the feeling of success. This can in turn increase their motivation to go further. Users can be guided into increasingly difficult tasks by increasing the difficulty of these "baby steps" [2].

2.2.2 Self-Determination Theory

The Self-Determination Theory (SDT) provides a construct that can be used to explain human motivation and the internal processes behind it. SDT considers influences that have an impact on motivation and explains the various types of motivation that exist. According to SDT, there are two main types of motivations: extrinsic and intrinsic. They possess different orientations and have different un-

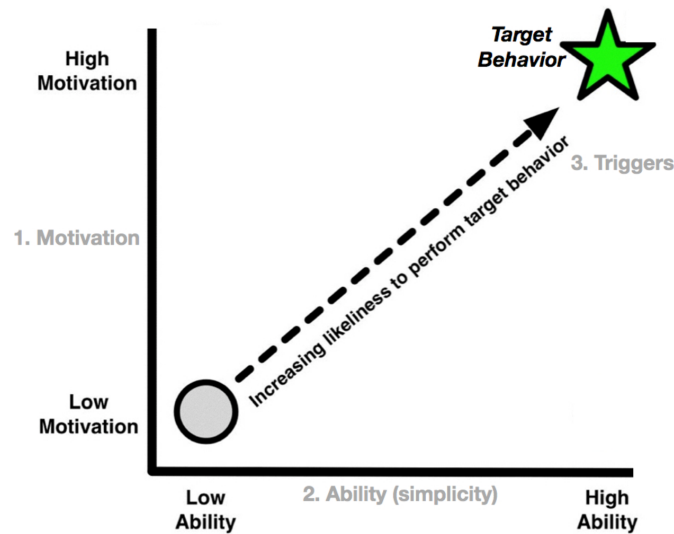


Figure 2.3: Fogg Behavior Model

derlying attitudes and goals that trigger action [82]. Extrinsic motivation refers to external rewards, such as doing something because it leads to a positive outcome (such as working hard for salary or admiration). Intrinsic motivation refers to one’s own values and interests and doing something simply because it is enjoyable (such as reading a book). A product that has some intriguing features, such as being aesthetically pleasing or challenging, can generate intrinsic motivation simply because it is interesting [45]. This notion resonates with one of the core beliefs of UX research, namely that products possess a hedonistic capital and qualities related to non-instrumental values [37]. According to the SDT there are three psychological needs that drive human behavior: autonomy, competence, and relatedness [80]. According to the theory, it is essential for humans to satisfy these needs in order to experience growth, integrity and well-being. Conversely, if these needs cannot be met, humans could potentially experience psychological harm [82].

Considering these needs while designing behavior change applications can lead to increased user engagement and also shape long-lasting user behaviors and well-being [45]. In order to support autonomy, designers can create applications that allow customization. That way, users can feel like their individual needs and goals are central. In order to support competence, designers can implement feedback of progression and achievements in their applications. That way, users can be proud of their accomplishments. Lastly, in order to support relatedness, designers can create applications that help users to connect with others that share similar goals or interests. That way, users can feel connected to a community that they can relate to [82].

2.2.3 Self-Perception Theory

According to the Self-Perception Theory (SPT), humans generally interpret their opinions and attitudes through self-observation. This means that if humans agree to a particular request, they will likely interpret this agreement as them being in

favor of the issue in general. Based on this inference and interpretation, they will be more likely to agree to related future requests. In other words, previous commitments or agreements will shape humans' perception of themselves, such as their beliefs about their identities, values, preferences and more. SPT is based on the fact that consistency is seen as a highly valuable trait by society, encouraging people to behave consistently to satisfy these societal expectations [76]. A related theory which has been drawn from SPT is the Commitment-consistency Theory (CCT). According to CCT, commitment can be used as a strong persuasion technique. By making people agree to performing smaller tasks, they are more likely to agree to perform the next bigger task in order to stay consistent in their behavior. In other words, making people agree to something seemingly insignificant can be used as a compliance technique as it increases the likelihood of long-term commitment [14]. The commitment nudge and the personalization nudge are two digital nudges that can be used to influence users behavior in digital environments (see Section 3.3.1.3), and they are both related via SPT. The commitment nudge involves asking users to complete or commit to a small task. By committing to such small and seemingly insignificant task, the user's need for self-consistency will most likely make them feel obligated to commit to the next larger task. The personalization nudge involves letting the user enter personal information, such as interests or goals. By providing personal information, users may feel like co-creators of value and that way feel more commitment to keep using the application and become long-term users [76].

In conclusion, all three theories provide different perspectives on human motivation and behavior. However, all three frameworks support the need of goal-specificity in order to trigger motivation and behavior. FBM highlights the importance of designing for simplicity in order to improve users ability of taking action. Eyal [22] argues that simplicity can reduce navigational excise and thereby support user goals, which can increase motivation as a result. Furthermore, FBM argues that triggers are essential in order to activate motivation and behavior, and states that both external and internal triggers exist. Likewise, SDT argues that both extrinsic and intrinsic motivations exist, and that one of the fundamental psychological needs that drive human behavior is autonomy. To support autonomy, SDT argues that softwares must allow customization and by the same token support user goals. Finally, SPT focuses on persuasive techniques to a large degree, where one fundamental technique is to use personalization nudges in order to nudge users into making long-term commitment to a new product or service. Lastly, some theories support one of the fundamental beliefs of UX research, namely that humans are influenced and motivated by non-instrumental hedonistic variables to a large extent [37]. Thus, other than creating usable and functional systems, designers should strive to understand what psychological and societal triggers may influence users behavior and motivation to engage with products. Understanding users context and goals of use are therefore crucial for understanding how to shape long-term commitment.

2.3 Onboarding

As previously mentioned, learnability and the importance of providing effective help systems for new users that interact with software applications is central to HCI practice and research [73]. The term onboarding originates from organizational theory and refers to an organization's processes of integrating and socializing newcomers to the organization [48]. As the HCI community has faced similar challenges regarding introducing new users to interface designs, the term onboarding has been widely recognized and adopted by the HCI community as well. Recently, the UX community has also noted the significance of designing well-crafted step by step processes that facilitate new users introduction to new applications [73]. According to Jakob Nielsen [59] users of websites often leave web pages in 10 to 20 seconds, and less than 25 % of all new users never return to an application after their first use [74]. Regardless of what value a product can offer, the onboarding experience is the only part that every user will experience [41]. Hence, this initial interaction with a product will by default frame and determine the users future interactions with the product. As a consequence, onboarding by definition becomes one of the the most crucial design strategies of an interface [74]. The following subsections will cover various definitions of onboarding in the context of UX design, as well as onboarding elements and frameworks that have been suggested by practitioners in the UX field.

2.3.1 Definitions of onboarding

Although onboarding lacks a consensual definition in the design community, it consists of a sequence of steps that introduces users to a new product, service or interface [11]. According to Marina Cardoso [12], user onboarding is a conceptual process of turning first-time visitors into long-term users, communicating how the technology works, establishing its value to the user, and scaffolding the first experience by providing a sense of direction towards a predetermined goal. Strahm et al [74] defines user onboarding as "a key aspect of the user experience that allows users to discover application functionality in a timely manner and identify how this functionality might allow them to achieve their personal goal". Samuel Hulick [41] defines user onboarding as "*the phase a customer goes through in between making the decision they want to use a product and being a fully satisfied customer extracting lots of value from the product*". Galavan [32] argues that every successful onboarding phase should consist of the three following core components:

1. UI design patterns: this can for instance include gamification, progress bars, audio guidance, and first use tutorials. According to Galavan [32], these patterns should guide the user through meaningful steps towards their goal and not only point out the interface's features.
2. Contextual educational content: some of the content that normally resides in the help center, such as demos, webinars, docs and videos, should be selected and included during the onboarding phase as well. Galavan [32] argues that

2. Theory

this content must be used in the right context during the onboarding so that it supports the user journey.

3. Contextual communication: this refers to in-app messages, such as welcome messages. According to Galavan [32] designers should not exclusively rely on in-app messages to avoid information overload, but use them as complements to other onboarding content.

When designing an onboarding experience it can be tempting to create guides and tutorials which clearly and efficiently highlight the functions of an interface. According to Oxford Learner's Dictionaries [20] the definition of the term onboarding is: *"the process of ensuring a new employee or customer becomes familiar with an organization or its products or services"*. By creating an understanding of onboarding based on this definition, the scope of an onboarding may seem limited to simply familiarize users with an interface, and to showcase the benefits of the product from the businesses point of view. This is however far from correct, as an onboarding is a much more complex experience which goes beyond surface level elements such as interface and functions [78]. Any successful onboarding experience needs to focus around one main issue: understanding the new user's goals and what successful moments they are trying to achieve, and making sure that they feel like they are on the right path towards achieving these goals by using the product in question [78]. This means that it is crucial for designers to identify what the users define as successful moments, and shift the focus away from what the business defines as successful.



Figure 2.4: A figure from the book "Intercom on Onboarding" depicting how an onboarding should support users goals over business goals

Traynor [78] argues that the primary onboarding mistake businesses make is thinking from the inside out, and not rooting their thinking in the outcomes that the customer aims for. The aim of an onboarding experience should be to recognize each new user's individual needs and challenges, and clearly show how the product can offer them personal guidance of achieving their desires. Hulick [41] explains that a good onboarding is more than an instructional manual and more like a personal trainer with the goal of engendering success in its clients. Clay Christensen [41]

coined the term “Jobs-To-Be-Done”, which implies that products are being “hired” by customers to fix a problem. Designers must understand why a product has been “hired” by a user, and they can only do so by conducting rigorous user research to make in-depth profiles of their users [41]. Hulick [41] argues that designer should conduct qualitative research with users who have recently experienced their switching moment, namely the moment that transformed them from being new or inactive users to active users. Through such studies, designers can get an understanding of what the switching moment translates to, and aim towards guiding new users towards that same switching moment.

Ruairí Galavan [32] expands the definition of onboarding by stating that it is an ongoing process without a finite ending. It is a continual mission, mindset and strategy, which needs to continuously adapt to the changes that the users and the business are undergoing over time. Beyond serving as the introduction of a product and an initial set up for new users, it is a long-term strategy which plays a crucial role in every users’ entire lifecycle (see Figure 2.5). Galavan [32] argues that new users bring with them new needs that must be considered in the onboarding experience, because they carry with them new user goals and new design challenges. Similarly, old users also transform over time, as they formulate new goals that come with new challenges. Furthermore, expert users should not be forgotten simply because they are not new users anymore, but need to be taken into consideration so that they can be retained, or they may as well leave the product or service and switch to another [32].

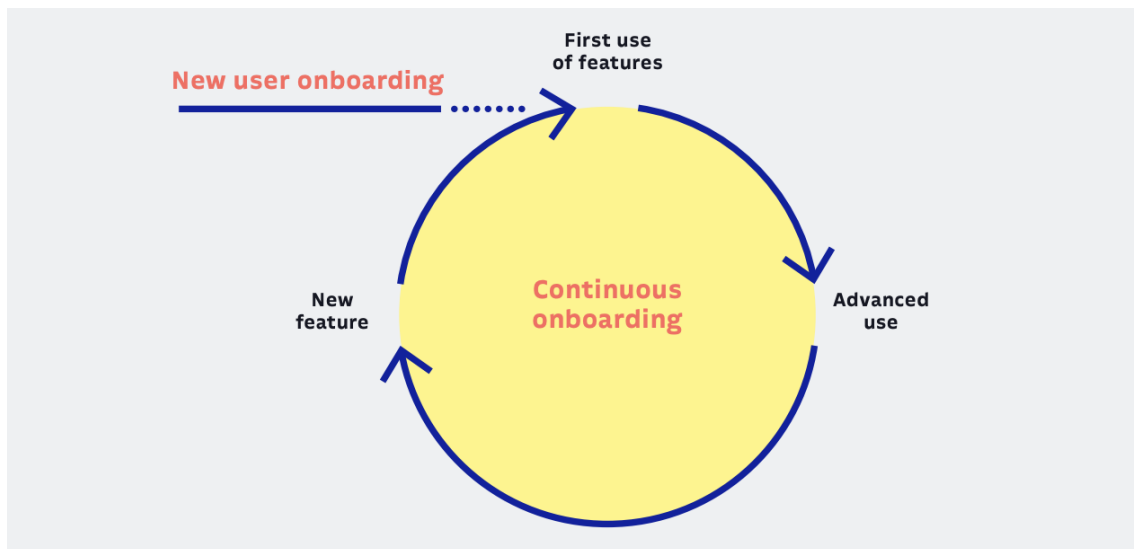


Figure 2.5: A figure from the book "Intercom on onboarding" depicting how onboarding is a long-term strategy

Furthermore, Galavan [32] explains that the onboarding experience needs to be a holistic system, and can be achieved if all different departments of a business are actively working towards achieving the same onboarding goals. He means that onboarding is more than sporadic notifications or UI elements that are being handled

by separate departments, but a unified whole which overlaps with the rest of a system (see Figure 2.6). Therefore, onboarding can be seen as an ever-evolving and holistic design strategy, which is highly embedded and integrated with the rest of a system, and which constantly follows and checks in with the users in every step of their user journey and lifetime.

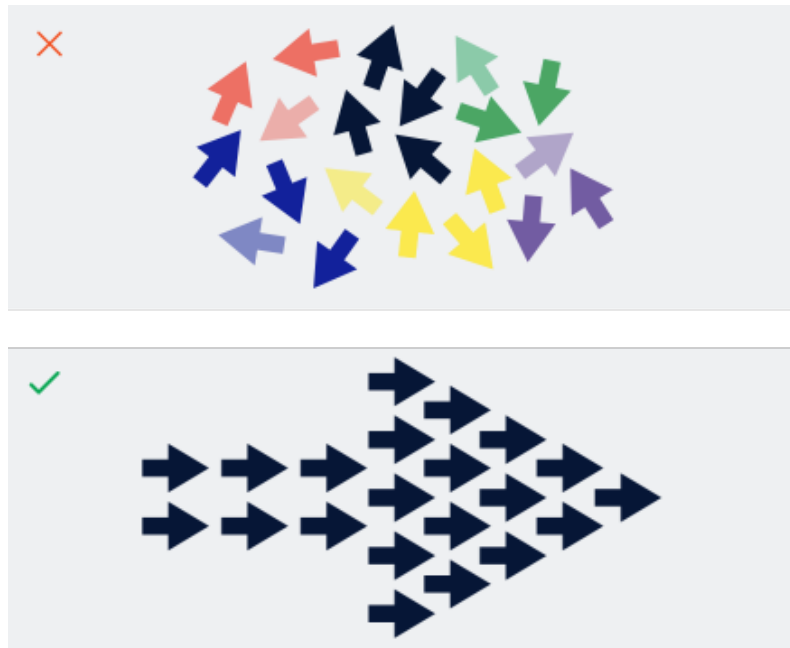


Figure 2.6: A figure from the book "Intercom on onboarding" depicting how onboarding should be treated as a holistic system

In conclusion, onboarding is a key moment in the user journey which communicates the value of a product or service, thereby scaffolding the users understanding of the product or service and how it can help them achieve their personal goals, which ultimately determines if the user will or will not transition from being a one-time visitor into a paying customer. The definition can also be expanded and seen as a long-term strategy to activate and retain users.

2.3.2 Onboarding strategies

Although there is insufficient methodological and theoretical guidance to support onboarding design decisions [11], some frameworks and theories have been suggested by practitioners and researchers in the field. In this section, onboarding frameworks, strategies, and guidelines will be examined.

2.3.2.1 The "Aha!"-Moment and the Quick Win

As previously stated, a good onboarding design should not simply only introduce a user to an interface and point out functions and features, but guide a user towards their individual goals of signing up [41]. It should recognize the users needs, have a clear value proposition, and showcase how the product can help them achieve their

goals. To do so, Hulick [41] has proposed an onboarding strategy that focuses on two meaningful points:

1. The “Aha!”-Moment: the moment when the user recognizes the value of a product and how they can achieve personal benefits through using the product.
2. The Quick Win: the moment when the user makes tangible progress of achieving one core benefit. The quick win should be easily attainable and serve as a positive conclusion to the user journey

According to Hulick [41], designers must make design choices that actively guide users towards their “aha!”-moment and quick win, and this is best accomplished by anchoring the design decisions in extensive user research. Allan [3] mentions that some products have a longer path to value than others, and in such circumstances introducing users to their “aha!”-moment become more complex. He argues that it is crucial that the user still gets as close to this experience as possible, by showcasing how the product can be beneficial in the future if they commit to the process. According to Allan [41], this is achieved by returning to the users “Jobs-To-Be-Done”, and effectively reassure that the product can fulfill the users needs. Although

the “aha!”-moment and the quick win are two moments during the user journey which still are not empirically validated, the framework has been recognized and successfully utilized by researchers. Strahm et al [74] argues that the framework possesses great value for understanding what stages new users experience during the learning process. They furthermore make the analogy between the framework and the term *threshold concepts* from the educational literature. *Threshold concepts* refer to a key moment during a learning process which radically transforms the learner’s way of understanding, interpreting, or viewing something, which is essential for the learner to progress. This notion rejects the task of transmitting bulks of knowledge to learners, but instead follows a “less is more” approach [17]. It appears that the “aha!”-moment shares many of these characteristics, by being a transformative and irreversible shift in a users perception of a product. Like *threshold concepts*, the “aha!”-moment supports integration of previously arbitrary information and features into a coherent mental construct, which in turn supports understanding of a product’s personal and purposeful use. This learning approach is consistent with HCI literature about positioning user’s mental models in relation to system models to increase learnability, usability, and functionality [74].

2.3.2.2 Minimalist Instruction framework

The minimalist instruction (MI) framework proposed by John Carroll is an approach to design software training manuals and can likewise support onboarding goals. The primary statement is that users should read less and do more, and quickly recover from errors [9].

The four main principles of the framework are the following [74]:

1. Choose an action-oriented approach: this principle relates to engaging the user in activity early in the learning process to build and sustain engagement. It is based on the notion that effective learning is situated in meaningful action, and that new users have an urge of making tangible progress towards reaching their goals.
2. Anchor the tool in the task domain: this principle relates to creating immediately understandable tasks that are easy to complete by the users, in order to provide personally relevant rewards.
3. Support Error Recognition and Recovery: this principle relates preventing errors from happening, and providing the user with clear recovery paths when they do occur. This principle shares consensus with the first and most important principle in Hinze-Hoare's [39] literature survey on the eight most fundamental usability principles (see Section 3.1.2.2).
4. Support reading to do, study and locate: the final principle relates to making instructions and help documentation direct, concise, and contextual, and grouped into distinct chapters [74].

The MI framework has through various studies proved to be an effective approach to use when designing onboarding experiences [74] [31]. The framework encourages an approach which balances user's need for information with their need for exploration and production [9]. Furthermore, the argument that users crave making tangible progress which supports the first action-oriented principle can be connected to Hulick's [41] principle of guiding users towards a quick win. Additionally, the MI framework's primary statement is that users' should learn through action rather than reading in order to obtain a meaningful comprehension of a system. This statement relates to the concept of *threshold concepts*, which likewise promote a "less is more" approach and rejects the notion of transmitting bulks of knowledge to learners but focusing on meaningful transformative moments.

2.3.2.3 Digital Nudges

Digital nudges refer to using persuasive technological techniques in order to influence users behavior and decision making in digital environments. Digital nudges can be used in different ways, such as default settings, reminders, notifications, feedback loops, or social comparisons [83].

Two widely employed digital nudges are the commitment nudge and the personalization nudge, and their psychological underlying effects are related via the Self-Perception Theory (see Section 3.2.3). The commitment nudge involves encouraging users to commit to a seemingly insignificant task or goal, which will increase the likelihood of committing to the next bigger task, namely becoming a permanent user. An example of such a task could be encouraging users to follow a new person on a social media application. The personalization nudge involves using personal information provided by the user to deliver a customized user experience and targeted

solutions [76]. This nudge can help reduce information overload and increase goal specificity, an approach that has been highlighted by many practitioners in the field.

Both nudges are widely used and considered to be powerful techniques to increase user activation [4]. AirBnb, Slack, Netflix, and Duolingo are examples of companies which all use commitment and personalization nudges to activate and onboard new users [76]. Orji et al [63] found the commitment nudge to be the most persuasive technique after studying technology-mediated persuasion strategies, and Aggarwal et al [1] found the commitment nudge to effectively trigger consistent behavior, especially in situations where the user's involvement is particularly low. Other than serving as a representation of users preferences, the personalization nudge has been found to increase user engagement by making users feel more invested in a product and like co-creators of value [76]. A study conducted by Terres et al [76] showed that using these two nudges proved to be highly useful when designing an onboarding experience, both when used in isolation but even more so when used in combination. The study concluded that acquiring small, active commitments during an onboarding phase, triggered users' intention of consistent use of an app. Moreover, the study confirmed the notion that user-driven personalization nudges increased goal-specificity and the users perception of being co-creators of value, which in turn affected their intention of using the app. Finally, the study noted that the presence of a personalization nudge amplified the effect of commitment on the intention to use the app. While the research shows promising effects of utilizing digital nudges to influence users behavior in digital environments, there are potential risks and ethical considerations to be taken into account. Digital nudges can unintentionally manipulate user's behavior or sustain biases if not carefully designed. Moreover, it is worth considering whether the use of digital nudges violate the boundaries of users' individual autonomy and freedom of choice [83].

It seems highly evident that many of the onboarding frameworks presented earlier share several characteristics. Both of the digital nudges show similarities with previous onboarding frameworks. The personalization nudge can be compared with the "aha!"-moment, where both strategies emphasize the user's personal value of using a product. Additionally, both the personalization nudge and "aha!"-moment promote goal-specificity. Much like Hick's Law and SDT states, goal-specific design strategies help users to customize the experience in order to support their personal goals and reduce cognitive load, a fundamental usability principle according to the HCI community. The commitment nudge can be compared with quick wins, as they both encourage users to make tangible progress. The commitment nudge can also be compared to the MI frameworks first principle of action-oriented learning. In addition, the commitment nudge by definition follows the same logic as Fogg's recommendation of introducing "baby steps" to users, in order to increase motivation over time.

In conclusion, all onboarding strategies share consensus with statements made by practitioners in the field regarding the definition of onboarding (see subsection 3.3.1), by promoting goal-specificity, and being customer centered rather than business cen-

tered. Acknowledging the users' personal goals and actively guide them towards their successful moments must be the priority of any learning process. Moreover, many of the strategies also show congruence with HCI usability principles of reducing cognitive load and following users mental models. By designing goal-oriented onboarding phases which take into account users purpose of signing up and actively guides them towards this objective, the reduction of cognitive load can be achieved while the mental models and constructs of the users are being taken into significant consideration. Interactions should be designed to promote tangible process and tasks should be situated in meaningful action. Implementing design strategies that promote action-oriented learning and introducing "baby steps" to increase long-term commitment facilitates learning and increases user loyalty. Finally, successful onboarding strategies should predominantly be based on *threshold concepts*, i.e. focusing on users' key activation moments above all, in order to engender success in the users and ultimately the business as a result.

3

Methodology

A number of design frameworks exist within the field of interaction design to help designers to frame their design thinking and research. The design process of this research has been defined based on principles and methods from a combination of design frameworks from Human-Centered Design, Participatory Design, and Goal-Directed Design. This section will discuss design thinking and design research, as well as the chosen design frameworks and methods for this research.

3.1 Design Research and Thinking

The design process differs from other scientific processes in the way that it deals with “wicked problems”, namely ill-formulated and confusing problems with conflicting values and information. Unlike researchers from other domains, designers must deal with indeterminate problems that do not inherit definitive and concise conditions or limits [6]. In the current scientific paradigm, scientists base their research around falsifiability, namely the capacity for some theory or hypothesis to be proven wrong. However, according to Gaver [33], designers must not be concerned with falsifiability or “what is”, rather they must be concerned with “what might be”, namely what is unknown and can not be falsified. Due to this erratic nature of design research, design research is often non-quantifiable and has not been standardized by providing a recommended path for designers to take. This makes design research radically different from other scientific research. Based on this notion, Gaver [33] further argues that design should not seek agreement among theories. Rather, it should welcome diversity in practices and theories, and allow the exploration and development of multiple solutions to the same problem in order to include multiple perspectives.

Design thinking is the name of the non-linear, explorative and iterative process developed to deal with wicked problems. There are a number of defined design processes that are based on design thinking. However, central to all design processes and frameworks are empathizing with users, defining design challenges, and exploring, iterating, and testing multiple ideas [27]. A visual map that can be used to visualize the design process on a high level is The Double Diamond (see Figure 3.1). It highlights two predominant steps which occur twice during a design process, namely a divergent step of exploring a problem space deeply and widely, and a convergent step of narrowing down the problem and taking focused action [16].

A great number of design methods exist and can be utilized during a single design project. Some complex phenomena may especially require that multiple methodolo-

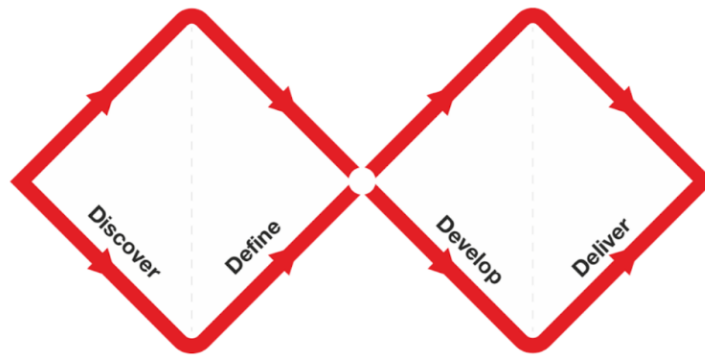


Figure 3.1: Double Diamond

gies are applied in combination in order to understand and evaluate them properly [72]. A common recommendation is to integrate qualitative and quantitative data, as they approach a question from two different angles and together provide more nuanced knowledge of a problem area. Quantitative data is consistent, reliable, generalizable, and analyzed through statistical methods. It is appropriate to use to answer questions such as "what?", "when?", and "who?". Qualitative data can complement or refine quantitative data by providing more detailed information or explain complex issues. It is suited to use to answer questions like "why?" and "how?" [77]. Combining the strengths of the two methods can lead to better comprehensive understanding, as using only a single-method perspective is considered partial or incomplete. Additionally, it improves the accuracy of interpretation of results, thus enhancing research validity and reliability [75].

3.2 Human-Centered Design

The Human-Centered Design (HCD) framework encourages designers to always put the human first when designing systems. The goal of HCD is to incorporate the user's perspective into the development process in order to design a system that is easy to use [52]. It means to always accommodate the humans needs, leaving no room for ambiguity or misleadings. By observing how humans respond to systems, designers must tailor experiences that are based on the user's state of mind while interacting with and reacting to changes in the system [29]). Maguire [52] states that HCD to a high degree is about users' active participation and clear comprehension of the user and task requirements. By engaging end users, their attentiveness and adoption of the new software can be increased as they will believe that it was developed with their input instead of being forced upon them. Maguire [52] further highlights the importance of iterative software development. Receiving feedback from end users after they experience early design solutions is fundamental in the HCD paradigm.

Interaction Design Foundation [29]) provides four overarching principles of HCD: (1) people-centered, (2) solve the right problem, (3) everything is a system, and (4) small and simple interventions. The first principle involves making the users and their context the focal point as a way to design things that are appropriate to them. Second, designers must identify and understand the right problems, the so-called root problems. If designers do not address these fundamental issues, symptoms of a nonfunctioning system will most likely return. The third principle states that designers should see everything as a holistic system that is made up of smaller interconnected parts. Finally, designers are encouraged to not rush to solutions. Instead, they should do iterative work and continuously prototype, test and refine smaller design ideas one by one. Testing small and simple interventions will create bigger and better results in the end.

3.2.1 Participatory Design

As HCD is a highly user-centered practice, participatory design (PD) is an essential part of HCD. PD is a collaborative design method where the users are significantly involved throughout the design process. It is an approach which invites the users to become partners in the development process, rather than being mere research subjects at the start or at the end of the design process [69]. PD is considered to be an expression of design as a societal activity, by demonstrating how the design process expands beyond the designer. Inviting users to actively engage in problem raising, discussion and decision making, lead to diverse perspectives and can generate more creative solutions [51]. Moreover, PD can lead to users feeling a higher ownership of the outcome, thus increasing the user satisfaction and integration of the product in the environment where it will be used. PD is highly user-centered, as HCD involves collaborative practices to a large extent. Likewise, HCD assumes that higher user involvement will lead to design solutions that are better suited for the end users. In PD however, the users are more viewed as team-members and co-creators, than they are in HCD where they are more being represented by the designer [69].

3.2.2 IDEO's Human-Centered Design process

HCD is commonly used to establish design processes in a number of organizations, one being the non-profit design studio IDEO. According to IDEO [42], HCD is about realizing that the people who interact with systems or problems first-hand are the ones who hold the key to the answer to the problems. By following a HCD approach to design projects, designers can create solutions that are rooted in people's actual needs. Thus, one focal point in HCD is first and foremost about building deep empathy with the users that one is designing for [42]. Although no design process is strictly linear, IDEO [42] has developed a design process which captures three essential steps that the designer will go through when they follow a HCD approach (see Figure 3.2): 1. inspiration, 2. ideation and 3. implementation. During the first inspiration phase, the designers collect information about their users to frame their design challenges and get smart on the challenge. During the ideation phase, the designers have to make meaning out of everything that they have learned during

the inspiration phase. Based on these insights, they explore potential solutions and design opportunities that they test and refine. During the final implementation step, the designers get the chance to implement their final solution to test what impact it has in the real world [42]. Much like the Double Diamond, IDEO’s design process follows a two-folded divergent-convergent process.

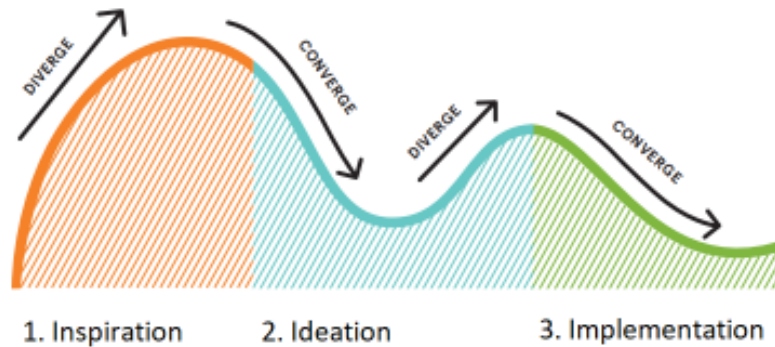


Figure 3.2: IDEO’s (2015) Human-Centered Design Process

3.3 Goal-Directed Design

According to Cooper [15], users are ultimately motivated by their goals. By separating goals from tasks and activities and making design decisions based around these goals, user performance can be improved and unnecessary steps towards reaching these goals can be reduced. The Goal-Directed Design (GDD) framework always has the user goals in focus, and promotes scenario-based design techniques. It blends ethnographic methods with market research, stakeholder interviews, in-depth user models, scenario-based design, and a set of interface patterns and theories. In addition to addressing organizational, technological, and user needs, it offers solutions that help users achieve their goals [15]. Cooper [15] distinguishes between three main types of user goals: life goals, end goals and experience goals. Life goals relate to high-level aspirations and dreams that usually go beyond the isolated context of a product. End goals relate to the goals that are associated with single tasks, such as using a product or performing an activity with a particular end goal in mind. Experience goals relate to isolated experiences, such as feeling in control, feeling smart or feeling satisfied with a particular experience.

The GDD framework is in many ways rooted in the concept of mental models [15], which in turn is one of the most significant concepts to HCI [58]. Mental models refer to the mental constructs of the reality that humans hold and which they use in order to make meaning and sense of the world around them. They are derived from personal experiences, which in turn generate expectations that humans turn to when they are interacting with new information problems. Rather than entering a new situation as a blank canvas, this theory suggests that humans are under a

lot of influence from previous experiences which may affect how they interact in new situations [84]. Cooper [15] states that successful systems are the ones that are designed based on the mental models of the users, and a strategy to understand mental models is to utilize scenario-based design techniques. In essence, the GDD framework supports design decisions that make things work in a way that matches with the expectations of the user.

Cooper [15] states that there are six stages to the GDD process: research, modeling, definition of requirements, framework definition, improvement and support (see Figure 3.3). During the research stage qualitative data about the potential users is gathered to understand the user, their needs and their context of use. To learn more about important stakeholders' needs, conducting competitor analysis and interviewing the participants is performed. All the information gathered during the research phase is integrated into a domain model that includes graphs and project schemes in order to produce a prototype. These come together to create a persona, which is a system comprising the unique attributes, behavior, and motives of a potential user. These activities together constitute the modeling stage. During the requirements definition stage, scenario-based design techniques are being used and focuses the scenarios on addressing the goals and demands of specific user personas instead of user tasks in a general way. Personas are being used to assist the designer in determining which steps are crucial and why, which enables the designer to create interfaces that demand the least amount of effort while providing the greatest benefit. During the subsequent framework definition stage, designers create the product concept. This stage involves defining the frameworks for the product's behavior, visual design and physical form, and mapping out locations of various functions to design after each unique user persona. Subsequently, the refinement stage follows the same steps as the framework definition phase, but with more focus on details and implementation. This is where visual designing focuses on smaller details, such as colors, size and icons. During this final stage of development support, developers are being supported while they are constructing the product. Even very well validated designs encounter technical challenges and questions. Not supporting the developers can result in scaled-down design solutions and risks weakening the design.

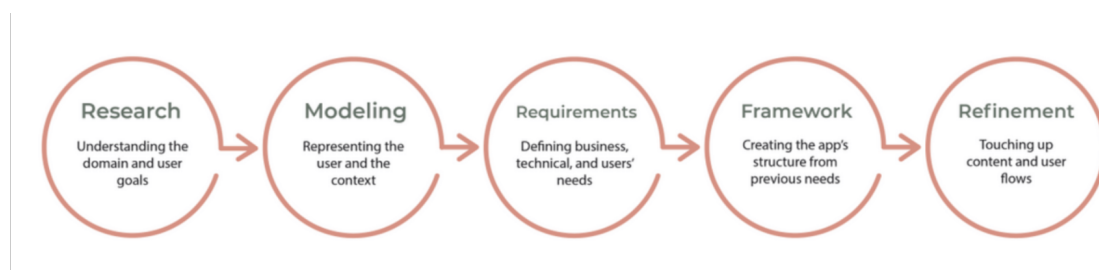


Figure 3.3: The Goal-Directed Design Process

3.4 Planning

The methodology for this research has been established through combining the design processes, principles and methods from the HCD and GDD frameworks. Although the HCD and the GDD frameworks share many similarities, the HCD framework focuses on the user needs whereas the GDD framework focuses on the user goals. Although users' needs and users' goals are closely related, they represent different information. This difference can be explained through the distinction between attitudinal and behavioral dimensions, which refers to what people say (i.e. user goals) with what people actually do (i.e. user needs), which are often very different [68]. Combining knowledge about these two essential factors - user needs and user goals - can aid the creation of more complex user profiles and result in design solutions which more accurately address the design problem.

The steps of the design process for this research will follow the HCD process suggested by IDEO [42], except an evaluation step will be added to the end of the process. Scenario-based techniques as suggested by the GDD framework will be used, as well as PD methods to make the research user-centered. Inviting users to collaboration can be an effective way of eliminating designer bias, which is imperative when designing onboarding experiences that are based on accurate user narratives [41]. To increase research validity and reliability, a mixed method approach will be used for this research by integrating quantitative and qualitative data. In this section, the methodological approach for this project will be presented following the structure of the HCD design process proposed by IDEO [42].

3.4.1 Inspiration

In the first step of the design process, the designer needs to empathize with the users by collecting data about what users feel, say and do. The more the designer can empathize with the users, the better they will understand their surrounding context, reasons for signing up, and their problems, needs and challenges [34]. This initial step of conducting user research and making meaning out of the data is one of the most crucial steps of the design process, as it helps the designer to form a comprehensive understanding of the users and their goals. This important phase has been highlighted by many practitioners in terms of designing successful onboarding strategies and is a significant part of the GDD framework's first research stage. For this project this step was focused around identifying the value propositions of Benify's platform, and their users goals and "aha!"- moments, as well as their key activation moments. This step was initiated by an extensive literature review to explore the context, related work and history around the design challenge.

3.4.1.1 Quantitative research and User Analytics

The use of e-commerce has grown rapidly in recent years. This signifies the increased importance of gaining knowledge in e-commerce-specific UX. Big e-commerce companies gather loads of data which, in many cases, is not treated as the asset it really is [47]. According to Davenport & Bean [18], a survey involving large corporations

showed that 53 % of them are not treating data as a business asset. Data-driven companies can for instance use their data to gain a deeper understanding of their users and how they can improve their onboarding experience by presenting a strong value proposition which is connected to their users individual needs and goals. User analytics is a quantitative data tracking and evaluation method used to understand how users' interact with a product or a digital platform. User analytics help designers understand user engagement and sentiment, issues with a product, monitor user journey at key moments like activation, or target users at specific moments in their journey. It is a quantitative method that passively collects data through softwares [43]. Benify uses the analytical software Qlik Sense, a tool which collects data about demographics, and how users behave and navigate their platform [67]. As mentioned previously, integrating quantitative and qualitative data is a recommended approach in design research. Quantitative methods are deductive, based on objective measurements, reliable and generalizable [72], but fall short when researchers must understand the context of a phenomenon [77].

3.4.1.2 Qualitative research and Interviews

As stated by Hulick [41], designers must conduct qualitative research in order to best identify the users successful moments, goals and “aha!”-moments. He claims that any successful onboarding strategy must be based on accurate user narratives. IDEO [42] argues that interviews are an essential point of the inspiration phase, as HCD is first and foremost concerned with getting to know the people that are being designed for. Furthermore, the GDD framework suggests that qualitative research through for example interviews should be carried out in the initial research stage [15]. Interviews are a qualitative research method, where researchers have a one-on-one session with a user to ask questions about a certain topic. Through these intimate sessions, researchers can gain insights about users' opinions on and experiences with products or services, and give detailed explanations about what they like or dislike, what features or steps they find more or less important, and suggest improvements [64]. Interview questions should preferably ask participants to recall events, rather than allowing simple “yes” or “no” answers. By encouraging participants to go back in their memory and recall actual events in detail, they can give more insightful, detailed and nuanced answers to real situations [64]. Qualitative data which can be obtained through interviews can help explain complex issues that can not be measured in a quantifiable manner, and should therefore preferably complement or refine quantitative data [77]. For this research project, interview sessions will therefore be conducted after insights have been obtained through quantitative methods.

3.4.2 Ideation

After the data collection process, designers need to create a comprehensive overview of the data in order to make meaning out of it. During this step, the designers should try to find patterns and parallels across the user's experiences in order to define for instance common pain points, challenges, or other experiences. When the designers have been able to identify a few design challenges they must brainstorm around

possible solutions [34]. This step covers the GDD framework’s steps of modeling, requirements and frameworks, as it includes identifying and establishing user goals and needs, and creating user personas and scenarios. For this project this step will focus around synthesizing and making meaning out of collected data in order to utilize scenario-based design techniques.

3.4.2.1 Data analysis and theme definition

A crucial part of the ideation phase is to extract important insights from the vast body of information that has been gathered up to this point. According to IDEO [42], to understand the collected data from the inspiration phase best, designers must try to look for emerging themes, trends and patterns. IDEO [42] calls this method “Find themes”. They encourage designers to notice if there are recurring compelling insights, consistent problems, or significant or surprising findings. Affinity Diagramming is an appropriate method to use to analyze a large amount of qualitative data. Through Affinity Diagramming, researchers can search through data and write down their observations, key words and insights on sticky notes. These sticky notes are then clustered into groups based on shared characteristics. Through these clusters and categories, themes, trends and patterns can emerge which can lead to new insights [53]. Based on themes that have been identified through data analysis, short phrases and statements are formulated as Insight Statements. The Insight Statements should then be compared to the design challenge, prioritized and discarded if needed. The insights should be used as a framework for all future steps of the design process. Insight Statements can later be rephrased as How Might We statements in order to turn insights and challenges into design opportunities. As stated by IDEO [42], How Might We statements are an incredibly valuable tool for framing innovative design thinking.

3.4.2.2 Scenario-based design techniques

According to Hulick [41], designers must use the user’s goals as the focal point throughout the whole design process. User personas are a scenario-based design technique and central to the modeling stage proposed by the GDD framework [15]. According to Cooper and the GDD framework, designers should not talk about users in vague terms such as “end users”, but instead define a specific user and invent a context and environment-based persona based on that user [21]. User personas are archetypical users that are based on real user research, whose characteristics and goals represent the needs of a specific group of users. They are presented in a description that includes various attributes, such as their goals, skills, attitudes, behaviors and background information. User personas are about considering a specific user when creating a product or service [62]. It is important to have a profound understanding of one’s target group in order to create a well-functioning product or service. User personas guides product teams in the right direction of understanding who they are designing for [55]. The goals of the persona should be the focus throughout the whole design process and inform or direct all subsequent design decisions [21]. User personas can be assigned archetypes in order to add more depth and layers to the character. Archetypes are similar to personas as they visualize the

same kind of insights. However, with archetypes information is instead presented by an abstract label that represents the defining behavioral or attitudinal characteristics of that user type [49].

Although Cooper argues that personas are the most powerful design tool for goal-directed design [21], it is important to consider the possible risks with basing decision making on fictive user personas. Chapman and Milham [13] state that personas can face major methodological and practical challenges. They argue that it is difficult to tell how many people a persona represents, making it difficult to determine whether a persona is relevant for intended users. They further claim that personas cannot be appropriately falsified or confirmed, resulting in no demonstrable validity.

According to IDEO [42], designers must create visual representations and frameworks in order to make sense of data. These frameworks can help highlight key relationships and develop a strategy. IDEO [42] suggests that journey mapping can be used as a framework to visualize a user's step-by-step interaction with a process they go through to reach a goal. It is compiled into a timeline filled with the users' thoughts and emotions in order to create a narrative. This exposes frustrations and delights the user experiences throughout the process. They give rise to opportunities to address pain points and increase the overall experience. In addition, it gives the team an aligned mental model which is a crucial goal of journey mapping [35]. Journey maps are another example of a scenario-based GDD technique as they represent the journey of a persona and thus add dimensions to the persona. Furthermore, journey maps can be used to identify where users may or fail to experience their "aha!"-moments and quick wins, and how they navigate towards trying to reach their goals. This resonates with how Hulick [41] states that designers must understand user narratives. Similar to journey maps, flowcharts are another framework that visualize the journey a user makes when navigating a space. Unlike journey maps however, flowcharts plot how users move through an interface by describing the relationships between pages, screens, and all the interactive possibilities that the user faces [28]. If journey maps visualize the emotional and attitudinal experience that a user has when interacting with an interface, flowcharts visualize the concrete steps, interactions and decisions that a user makes when moving through an interface.

3.4.3 Implementation

After choosing one or more ideas with potential, it is time to make prototypes to test for feedback. Evaluating the prototypes will reveal which components work and which needs to be iterated and refined [34]. For this project this step was focused around rapid and iterative collaborative prototyping.

3.4.3.1 Iterative prototyping

Iteration is central to HCD, according to IDEO [42]. Through iteration, designers can receive a vast amount of feedback from users, explore more ideas, unlock creativity, and arrive more quickly at successful solutions. IDEO [42] further claims that rapid prototyping specifically is an incredibly effective technique, because it

enables designers to test many ideas without wasting resources. Rapid prototyping helps making ideas tangible, increasing learning through creation, and quickly receiving feedback from users. Rapid prototypes are typically lo-fi, imperfect tangible representations of ideas to test and can be anything from storyboards, mock-ups, wireframes, and more.

It is imperative that designers make an effort to integrate feedback from users in every iteration as much as possible. By doing so, the feedback will guide the subsequent iterations, thus making the final solution as human-centered as possible [42]. In accordance with the GDD framework, this can also help the design process to continuously stay goal directed and avoid any deviations from the users goals [15]. Moreover, IDEO [42] suggest that Co-Creation Sessions is should be utilized to gain feedback on ideas and to include the users into the design process. Much like in PD, Co-Creation Sessions is about inviting users to join the team rather than just collecting data about their opinions. Inviting users for iterative prototyping is a good way of reducing designers' bias, to make the design process more user-centered, and to create design solutions that accurately address the goals of the users.

3.4.4 Evaluation

When the prototype has been iterated enough times to reach saturation, it needs to be tested on real users in order to receive feedback about how well the design solution actually meets the users needs. During this step, the designers need to evaluate whether the idea has successfully been able to solve the problem that initiated the design process to begin with [34]. For this project this step focused around evaluating the prototype as well as the success of implementing a more extensive onboarding phase in Benify's mobile application, both through user tests and evaluation tests conducted by the design team.

3.4.4.1 A/B Testing

A/B Testing is an optimization technique and evaluation method that facilitates comparison of two different versions of a design to see which one performs better. People are randomly assigned to one of two tests and when the sample size is large enough to be statistically relevant it is possible to determine which design showed the best results. The results are then compared with some defined hypotheses that are based on previous collected data. However, A/B testing does not give information on why a design performed better than the other one. Thus, A/B tests lack the strength of explaining the results and can merely conclude one or more hypotheses [53].

There are potential issues with A/B tests if they are not conducted correctly. Firstly, it is important to differentiate between design concept and implementation. A design variation may be based on a good design concept but receive negative feedback due to flaws in the implementation. Therefore, negative feedback does not always give reason to discard a concept. Moreover, it is important to uncover the root cause of a problem before making changes to a design variation. Changes to a vari-

ation that address invalid causes will never solve the right problem. This notion is confirmed by the HCD principle of understanding the right problems, the so-called root problems, in order to avoid negative symptoms to arise over again. According to Cardello [8], the best technique for optimizing A/B tests and addressing root-problems is to conduct user research before launching an experiment. Finally, it is important to remember that A/B tests provide a limited range of options for users to choose from. A winning variation may not be the most optimal design variation [8]. Figure 3.4 explains four important steps that must be defined to guarantee well executed A/B tests [8].

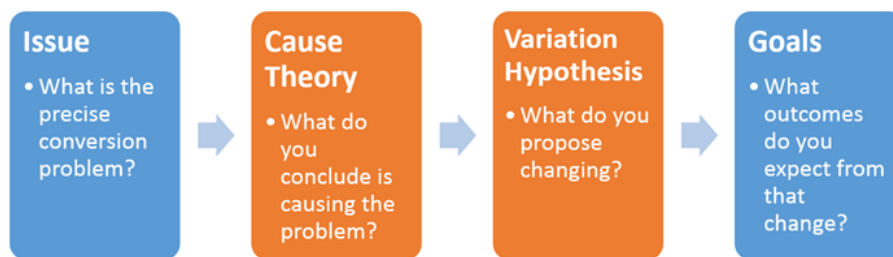


Figure 3.4: A/B Test Logic

3.4.4.2 Heuristic Evaluation

Heuristic evaluation is a method used to identify usability flaws in user interface design by analyzing it relative to established principles for what makes interfaces easy to use. Heuristic means “rule of thumb”, and it refers to very broad design guidelines that can be applied to a wide range of interfaces. Based on the ten most fundamental usability principles, Jakob Nielsen has developed the method 10 Usability Heuristics for User Interface Design. Using this method, designers can analyze their design by comparing it to the recognized usability principles. The goal is to create designs that do not violate any of the formulated usability principles [61].

Although they are generally accepted and widely used, researchers suggest that Nielsen’s heuristics should not be used in isolation but as a complement to other evaluation methods. Gonzales-Holland et al [36] argue that the method is general and can be a useful guide in assessing usability, but can not discover and assess all usability issues of an interface. Moreover, Gonzales-Holland et al [36] recommend that the method is used in the early stages of the development process, preferably before implementation.

3.4.5 Ethical considerations

As the research for this project is heavily based on extensive user research, several ethical issues will be considered when conducting the research. All participation will be voluntary, and the participants will be informed that they have the right to withdraw their participation at any time. Furthermore, the research will adhere to confidentiality, where the participants personal information will be either strictly anonymous or kept private and not shared with any other parties. Irrespective

3. Methodology

of which, the research will be based on informed consent, with full transparency and disclosure from the researchers part of how the data and private information will be treated. Furthermore, balancing corporate confidentiality with academic purposes is an important issue to acknowledge. While the research is heavily based on user research and data provided by the company, the integrity of the company and its' users must be respected and not violated by misusing the access to corporate confidential data, or by disclosing an excessive amount of information about them and their users.

4

Process

This research process was centered on acquiring a deep understanding of Benify’s users in Sweden. The gathered knowledge was utilized to redesign Benify’s mobile app onboarding. This chapter will in detail cover the thesis’ design process, which has been formulated based on IDEO’s [42] design process, and the HCD, PD, and GDD frameworks.

4.1 Inspiration

During the inspiration phase, designers must build deep empathy with the users, frame their design thinking and get smart on the design challenge [34]. Thus, this phase included deep literature research on onboarding, HCI and behavior theories, as well as quantitative and qualitative user research methods through site analysis and interviews with real end-users. The insights gathered from the literature review and the user analytics helped form the interview questions. Finally, a product teardown process was performed to get familiar with successful onboarding strategies in other applications.

4.1.1 Literature study

To support this research with existing theories and previous related work, an in-depth literature study on HCI, behavior theories related to motivation, onboarding design strategies and frameworks was conducted. Additionally, a literature study on design research and methodology, more specifically the HCD, PD, and GDD frameworks, was conducted to formulate a design process for this thesis.

4.1.2 User Analytics

To understand how Benify users navigate and behave on the platform, quantitative data from end-users in Sweden year 2022 which had already been collected by Benify through the software Qlik Sense [67] was examined. Data points from Qlik Sense was collected and transferred into Google Sheets, where data visualizations were created to make comparisons between user groups. By looking at this data, comparisons between different user groups and variables could be made, and conclusions across both user groups and all users could be drawn.

As Qlik Sense includes a vast amount of data and allows comparisons between

many parameters, a number of filters were applied in order to narrow down the scope and to hopefully observe differences between different user groups. At the most fundamental level, the data was filtered to only show Swedish end-users from the year 2022. Based on these selected users, additional filters were applied in order to compare user groups. The user groups that were compared were user groups per generation (00's, 90's, 80's, 70's, 60's, 50's, and 40's), and user groups per device (phone browser, mobile app, and computer).

4.1.2.1 Phone browser users

People that access Benify's platform through the browser on their phones were highly inactive and unengaged. Users of phone browsers had low login rates and fewer monthly sessions per user as can be seen in Figure 4.1 and Figure 4.2. Furthermore, as Figure 4.3, 4.4 and 4.6 shows, they had the lowest order rate, page views per user, and searches per user. This can be due to a large number of users eventually downloading the mobile app or switching to the computer instead as the phone browser is not optimized for the platform.

Despite being a highly inactive user group, phone browser users were almost as many users as the mobile app users. This is most likely due to the fact that welcome emails direct new users to the browser, so if they open the email on their phone, their first login and interaction with the platform will most likely be through the mobile browser. This can create a negative first impression as the mobile browser mobile appears to be a poor choice for visiting the platform. This indicates that redirecting users to the browser is a bad idea, and mobile users should instead be highly encouraged to download the mobile app right away.

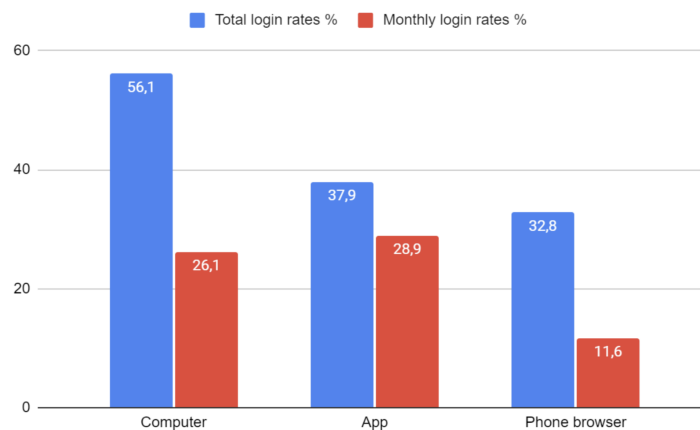


Figure 4.1: Monthly and total login rates, per device

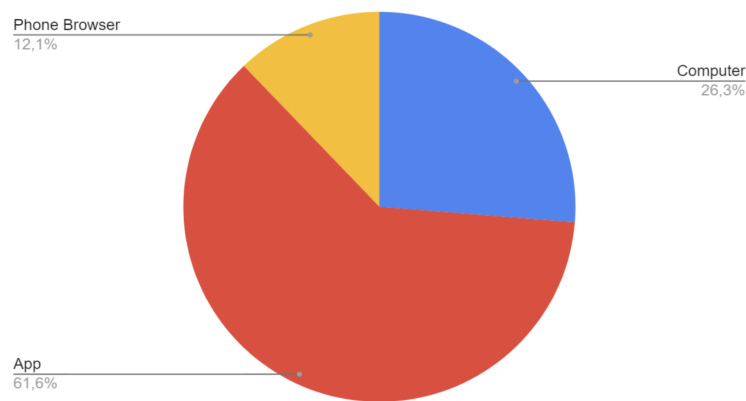


Figure 4.2: Monthly user session rates, per device

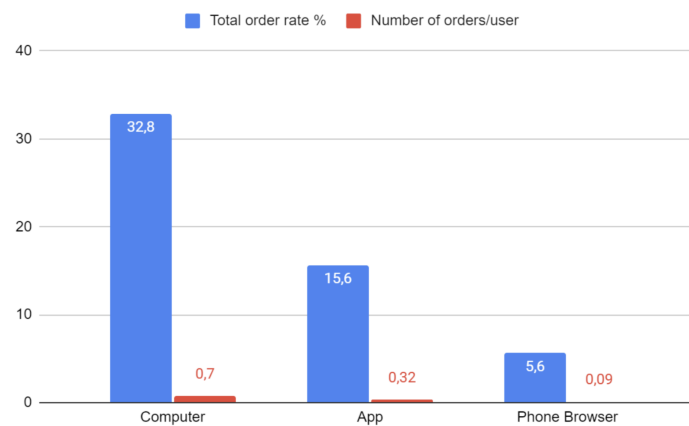


Figure 4.3: Total order rate, and average number of orders per user, per device

4.1.2.2 Mobile app users

Data showed that the mobile app was performing best in many aspects. As can be seen in Figure 4.2, mobile app users had significantly higher monthly user session rates than other devices. Mobile apps user also had the highest number of page views per user, as can be seen in Figure 4.4. Additionally, mobile apps users had the highest searches per user compared to other devices, which can be noted in 4.6. Although having the most user sessions, mobile app users spent the shortest amount of time online per session, which can be seen in Figure 4.7. However, mobile app users had a low order rate per user compared to computer users (see Figure 4.3). Finally, mobile app users were more consistent with their usage across the days of the week compared with the other devices. Although users from all devices had significantly lower login rates during the weekends, mobile app users had a more evenly distributed login rate across the week with a smaller difference in login rates between weekdays or weekends, as opposed to the other devices.

By investigating the differences in device usage by generation, it was discovered that there was a correlation between age and mobile app sessions per user, where

the younger generations had higher user sessions on the mobile app and older generations had high user sessions on the computer (see Figure 4.5). This suggests that Benify's future users who are coming from the younger generations will be more inclined towards using the mobile app over any other device.

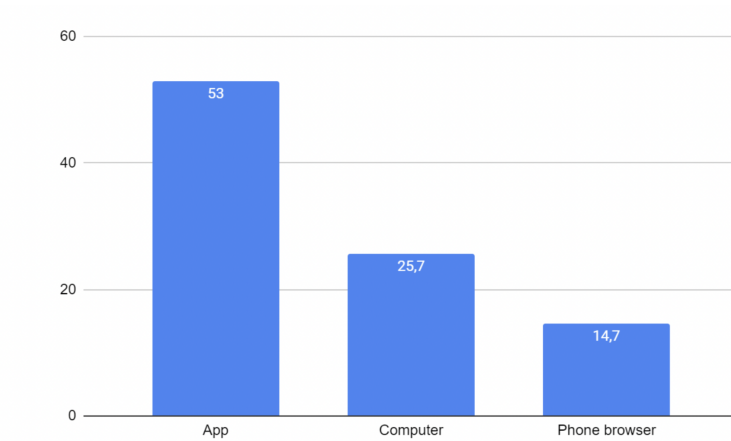


Figure 4.4: Average number of page views per user, per device

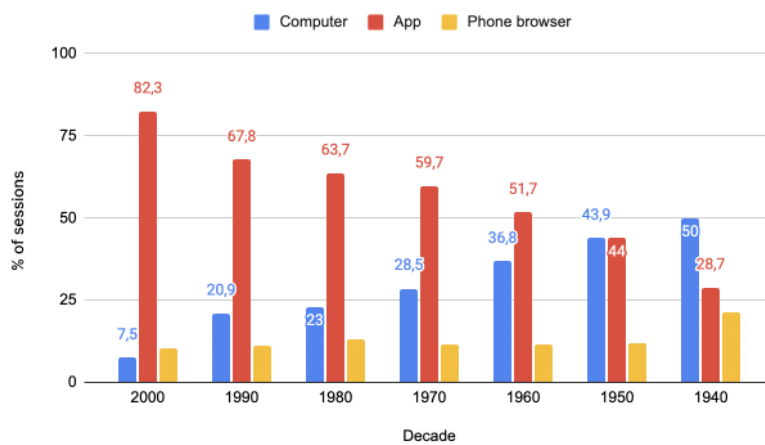


Figure 4.5: Login rates per device per user group by decade

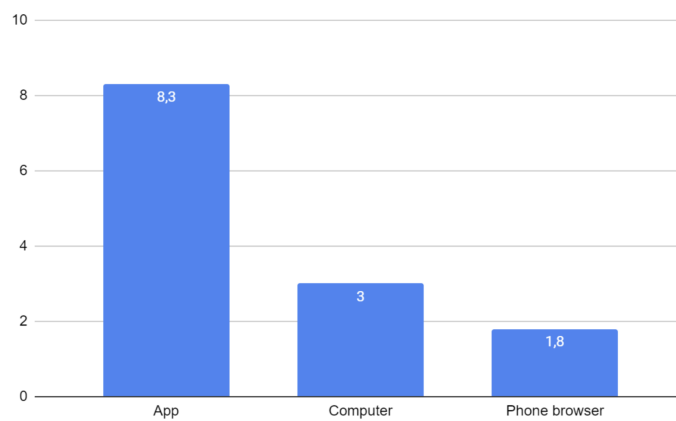


Figure 4.6: Average number of searches per user, per device

4.1.2.3 Computer users

Data showed that computer users had lower rates compared to mobile app users in many aspects. For instance, Figure 4.2 shows that computer users had lower session rates than mobile app users. Moreover, they had a lower page views per users as Figure 4.4 shows. Additionally, computer users had lower search rates than mobile app users as can be seen in Figure 4.6. Computer users did however have the highest order rates out of all devices as Figure 4.3 shows. Furthermore, computer users spent the longest time online per session as can be seen in 4.7). Finally, computer users were significantly less active during weekends than mobile app users. This might be because the mobile app is more convenient to use regardless of what context the user is in.

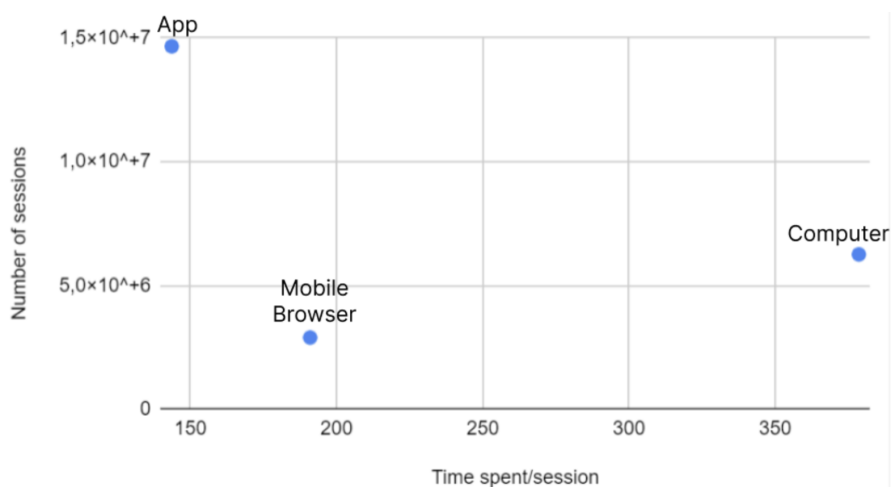


Figure 4.7: Average number of user sessions per user compared to the time spent in seconds per session, per device

4.1.2.4 Insights from analysis

The results from the user analytics suggest that the phone browser has the least engaged users and that new users should therefore not be encouraged to use it. Rather, phone users should immediately be directed to downloading the mobile app in order to maximize the experience and to maximize the first impression of the platform. Moreover, the mobile app seemed to be the best performing device in many aspects. mobile app users were the most active and engaged users, and browsed the platform more than any other user group, possibly because mobile apps by nature are readily accessible. But although mobile app users had frequent visits they also had shorter session rates and transaction rates than computer users. Computer users had less session rates and seemed to browse around less than mobile app users, but when online they spent longer time on the platform and made more purchases. This suggests that the mobile app is optimized for browsing, and the computer is optimized for purchases.

By identifying that mobile app usage performed best in multiple aspects, and that the younger generation, which represents Benify's future generation of users, seemed to favor the mobile app over any other device, the decision was made to focus on designing Benify's onboarding inside the mobile app. As mobile app users seemed more cautious making purchases compared with computer users, the assumption was made that an improved onboarding experience on the mobile app may result in mobile app users feeling more comfortable with making purchases on the mobile app as well.

4.1.3 Interviews

Onboarding strategies require deep understanding of the users goals with signing up. Moreover, ethnographic studies are essential to both the HCD and the GDD frameworks in order to gain deep empathy with the users and to better utilize scenario-based design techniques. Based on the observations that were gathered from looking at the quantitative data, semi-structured interviews that were conducted on real end-users were formed. Interview questions that were anticipated to provide in-depth answers to the motivations behind the users behavior on the platform were formulated. Some interview questions were based on observations made during the user analytics phase, in hopes of being able to fill out some knowledge gaps. Other interview questions were mainly formed to identify the users "aha!"-moments, quick wins, and "Jobs-To-Be-Done". The manuscript for the interviews can be found in the appendix, see A.12, A.13, A.14 and A.15. However, some additional questions were added, and some were excluded due to the semi-structured approach and depending on the direction that the interviewees took during the conversation.

Before the interviews, a pilot interview was conducted. It helped with identifying questions that had to be discarded, included or reformulated, the appropriate

order of the interview questions, as well as an estimation of the duration of the interview. Seven participants were recruited for interviews in total (3 women and 4 men). Three of them were recruited through Benify, who provided a list of users that had given consent to be contacted for interviews. The remaining interviewees were recruited through convenience sampling. Interviewees from as many different generations as possible were sought after as it could provide a broader range of thoughts and behaviors from Benify's users. Two interviewees was born in the 2000s, two in the 1990s, one in the 1970s, and two in the 1960s. All interviewees were informed that the interviews would be recorded, transcribed, and last approximately 20-30 minutes. They were informed that all collected data would be kept anonymous and were asked to give their permission to proceed (see appendix A.7). Five interviews were conducted in Swedish and two in English. They were conducted online through the online conference tool Zoom. The interviews improved the understanding of the users' behaviors, problems, thrills, and overall impressions of the platform.

Before the thematic analysis of the interview transcriptions, several insights became immediately apparent. Firstly, it was noted that the majority of the users appreciated the value of the platform. They agreed that the platform simplified their process of managing payslips, registering their wellness receipts, and tracking their wellness contribution. The majority of the participants also recognized that the platform offers a wide range of valuable deals to the users:

- *"I think that Benify has a very wide range of offers, I don't miss anything ... I feel inspired by the large range of deals"* - Woman, 57
- *"I expected the process of registering my wellness receipt to be tedious and complicated. It turned out to be extremely simple and efficient - I experienced no troubles."* - Woman, 28

One participant also mentioned that they could not appreciate the wide range of deals, as they were not personally relevant to them due to their geographical location. They expressed a desire to feel more included, and to only receive deals and offers that were accessible to them so that they would not have to browse through irrelevant information:

- *"There aren't enough offers for people living in smaller cities like myself"* - Man, 56

However, four participants expressed frustration over the design of the platform. They mentioned that the navigation was complicated, as many tabs and pages did not have clear distinctions or explanation of their purpose. It was noted that most users showed little to no tolerance to such hiccups on digital platforms, and were quick to abandon such products and services:

- *"If I don't understand an application I give up. I don't have the time to figure these things out and there are often better competitors that I turn to instead"* - Man, 56

The same participants also mentioned that they often experienced information overload when they visited the platform, and wished that their experience was more targeted and customized based on their personal interests and goals with visiting the platform:

- *"Scrolling through the discounts is like scrolling through Instagram; it is so much information that you become numb to it after a while and don't care to stop and have a look"* - Man, 27
- *"I wish I could select my purpose for each visit and then let the app help me to achieve my purpose"* - Man, 27

One participant significantly highlighted that the platform did not leave a strong impression on them, and therefore they considered it forgettable. They also expressed a desire to personalize the platform more as a solution to this issue:

- *"It didn't leave an impression. It's almost like invisible to me. When I think about it I associate it with work"* - Woman, 28
- *"It's almost too inclusive for every possible target group. Ironically it makes me feel more invisible and excluded. I would probably be more interested if it felt more targeted towards me personally"* - Woman, 28

Four out of seven participants also agreed that they preferred to browse the platform on the mobile app, but make purchases on the computer, as it made them feel more safe and in control. The rest of the participants mentioned that they were not aware that the Benify platform could be accessed through a mobile app:

- *"I only use the computer to access the platform because it feels like I needs to sit down and focus when I make important decisions such as managing my pay slips or wellness contribution"* - Man, 27
- *"Although I prefer to access the platform and interact with it through the computer I don't like such tedious process, as it takes time to access something through a computer and therefore reduces the accessibility and efficiency"* - Woman, 28

In conclusion, the interviews made it clear that Benify offers a valuable service, but that the threshold of realizing the value and becoming an engaged user is relatively high. The main aspect that might hinder user activation seemed to be the confusing interface which many users expressed a low tolerance towards, and an untargeted experience that do not currently support the users in reaching their personal goals.

4.1.4 Product teardown

IDEO [42] argues that getting smart on the design challenge by doing contextual research is necessary to create a comprehensive framework for the design process. An effective way of getting educated on the current design challenge and the current state of the art is to disassemble and analyze the current product being designed, as well as other successful products on the market. Hulick [41] suggests that designers perform a product teardown method on onboarding designs, in order to identify design flaws, inconsistencies, or successful strategies. Therefore, a product teardown was conducted on Benify's current onboarding experience to understand the current experience that the product offers (see Figure 4.9). Additionally, online research was performed in order to identify applications with a reputation of having successful onboarding designs. Thus, a state of the art analysis was performed by conducting

product teardowns on 5 different applications with well designed onboarding experiences. The selected apps were Duolingo, AirBnb, Mailchimp, Fastic, and Strava (see Figure 4.8). For analysis purposes, the apps were downloaded, and their onboarding phases were completed. Screenshots of every onboarding screen were saved and uploaded to Miro so that they could be analyzed further. In each screenshot, onboarding strategies were noted directly on the screenshots. The most prominent insights for each app was compiled into a list, and common onboarding strategies that every app shared could be identified and collected. The analysis served as great inspiration to the development process of the project.

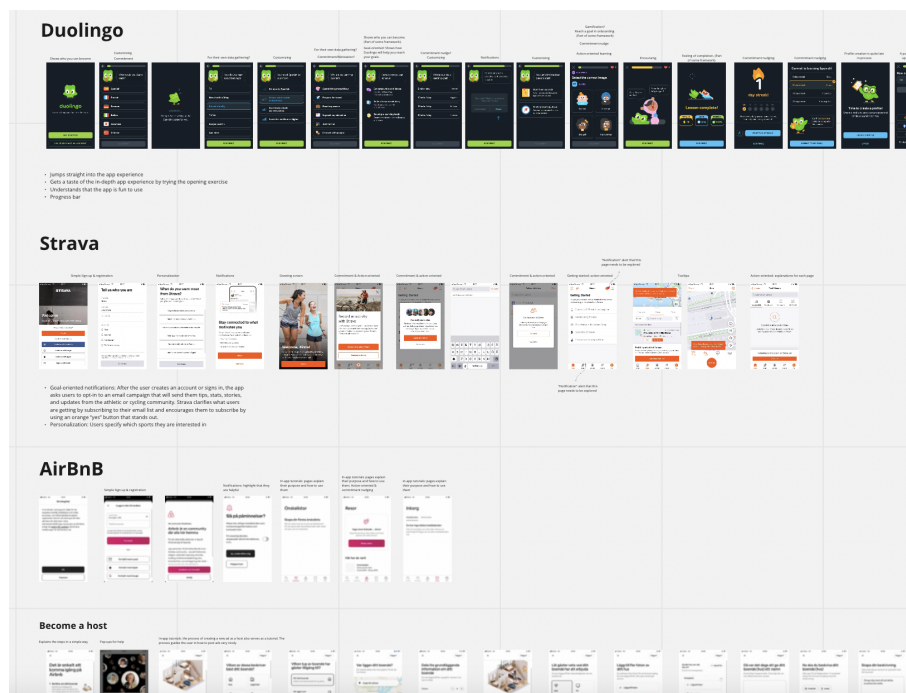


Figure 4.8: Product teardown of the state of the art

4.1.4.1 Benify's current onboarding

The key findings after analyzing Benify's current onboarding revealed that it lacks many onboarding strategies proposed by the literature and onboarding frameworks. Specifically, it lacks goal-specificity, something which has been significantly emphasized by practitioners, for example by Hulick [41], and the interviewees. The key findings were the following:

- It is not goal-specified. Rather, it welcomes the users to the company and platform in a generic way.
- It has not implemented a personalization nudge. The onboarding shows no interest in getting to know the user and understanding what their successful moments are. This does not help the users feel like the product is actively helping them to stay on the right path towards achieving their goals.
- It does not include a clear value proposition. One screen includes a short message which briefly states what the user can do on the platform, but it is competing for the user's attention with a lot of other written information

about how Benify treats personal data and can therefore easily be overlooked. I.e., there is no clear “aha!”-moment.

- No contextual educational content is included in any step of the onboarding, such as demos or guides.
- No feedback of progression or achievement is implemented.
- It is not action-oriented. The user is mainly passive throughout the onboarding and is not encouraged to do any tasks. Thus, the user does not gain any quick wins in order to achieve small benefits or make tangible progress. By the same token, the onboarding has not implemented a commitment nudge.
- It does not support reading to do, study and locate.
- The platform does not utilize any in-mobile app onboarding strategies other than including a three minute long educational video on the homepage. There are no implementations which nudge the users to find and watch the video.

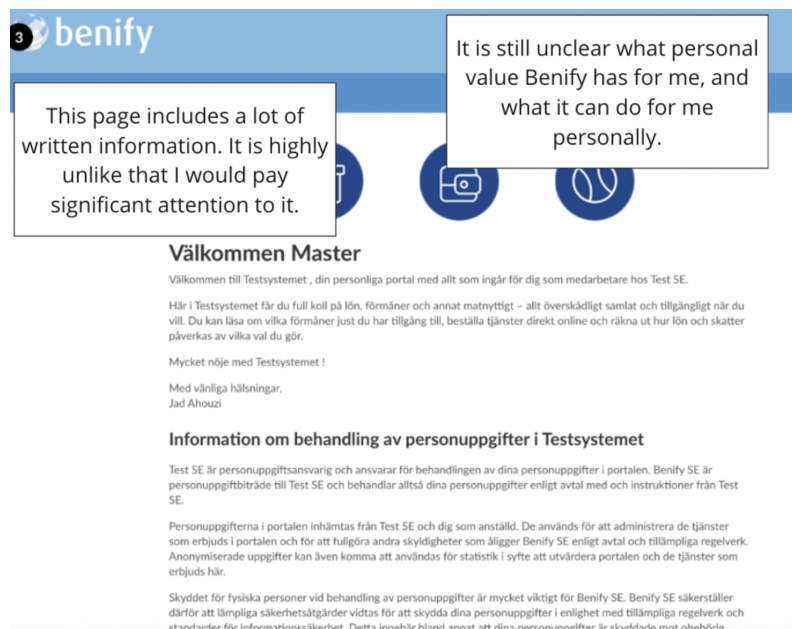


Figure 4.9: A snapshot from the product teardown of Benify’s current onboarding

4.1.4.2 State of the Art

The key findings after analyzing the onboarding experiences of 5 different mobile applications with a reputation of having successful onboarding experiences based on online sources, revealed that many of them utilize onboarding strategies suggested by the literature and onboarding frameworks. The 5 mobile applications that were chosen for analysis were Duolingo, AirBnB, Mailchimp, Fastic and Strava. Below are the key findings from analyzing the mobile application Duolingo. Figure 4.10 shows a snapshot from the product teardown of Duolingos onboarding.

Duolingo

- It is goal-specified and repeatedly states the value proposition of the product by explaining what the user can achieve through signing up, encouraging the user to recognize the “aha!”-moment.

- It utilizes a personalization nudge by letting the user choose which language they would like to learn and formulate their goals with becoming a registered user.
- It utilizes a commitment nudge by letting the user test their language skills in the language they chose to learn, ultimately leading the user towards a quick win. As the small test resembles how the user would interact with the mobile app as a registered user, this strategy is also a form of action-oriented learning and is anchored in the task domain.
- It uses various UI elements such as progress bar, gamification, and tokens to give feedback of progression and achievement.
- It has a simple sign-up process to facilitate the process of becoming a registered user.

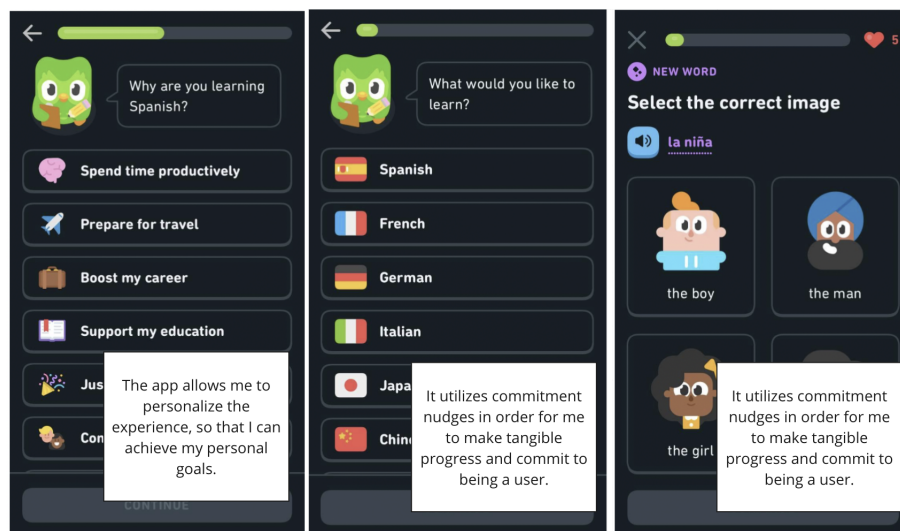


Figure 4.10: A snapshot from the product teardown of Duolingo's onboarding

The major findings from the remaining mobile applications can be found in the appendix (see A.16, A.17, A.18, A.19, A.20, A.21, A.22, A.23). The primary insights from product teardown were to add a clear value proposition, personalisation nudges, feedback of progression, commitment nudges, an action-oriented approach, and guidelines and tooltips. These insights were the selected top objectives for incorporation into the upcoming new onboarding design as they are elements considered crucial to include for a well-designed onboarding experience.

The insights gained from Product Teardown, combined with reading literature on current onboarding frameworks and tactics, gave a strong foundation for later in the process creation of an improved onboarding experience.

4.2 Ideation

During this stage, designers must make meaning out of the data collected from the previous step, and brainstorm around possible solutions to the identified design

challenges [34]. Thus, the research was continued by analyzing the collected data through semantic analysis. Based on the analysis, Insight Statements with corresponding How Might We Statements were formulated to narrow down the design challenge. Moreover, user personas with assigned archetypes, journey maps and user flows were created based on real user data and insights. Creating Insights Statements and user personas proved helpful in identifying where users experienced their “quick wins” and “aha!”-moments, by identifying what positive feedback was shared among most interviewees.

4.2.1 Compiling and analyzing data

After transcribing the interviews, an Affinity Diagram was created in Miro (see Figure 4.11), an online digital whiteboard that allows for easy digital collaboration [56]. Affinity Diagramming was used to analyze and organize data collected from interviews. The interviewees’ responses were written down on notes as observations, keywords, and insights, which were then organized into nine categories that emerged during categorization, which are the following:

1. Impression and personal value
 - (a) Platform has a weak impression
 - (b) Platform has a lot of personal value
 - (c) Personalization
2. Device
 - (a) Unaware of the app
 - (b) Computer users
 - (c) App users
3. Browsing
 - (a) Likes to browse deals
 - (b) Rarely browses deals
4. Activity level
 - (a) High activity level
 - (b) Low activity level
5. Shopping and spending
 - (a) Infrequent shoppers
 - (b) Frequent shoppers
 - (c) Goal driven and research focused shopping behavior
 - (d) Spontaneous shopping behavior
6. Interface and user flow
 - (a) Smooth and simple flow
 - (b) Complicated and messy flow
7. Learning and problem solving behavior
 - (a) Self-taught
 - (b) Asks for help
 - (c) Gives up quickly
8. Deals
 - (a) Good range of deals
 - (b) Personally irrelevant deals

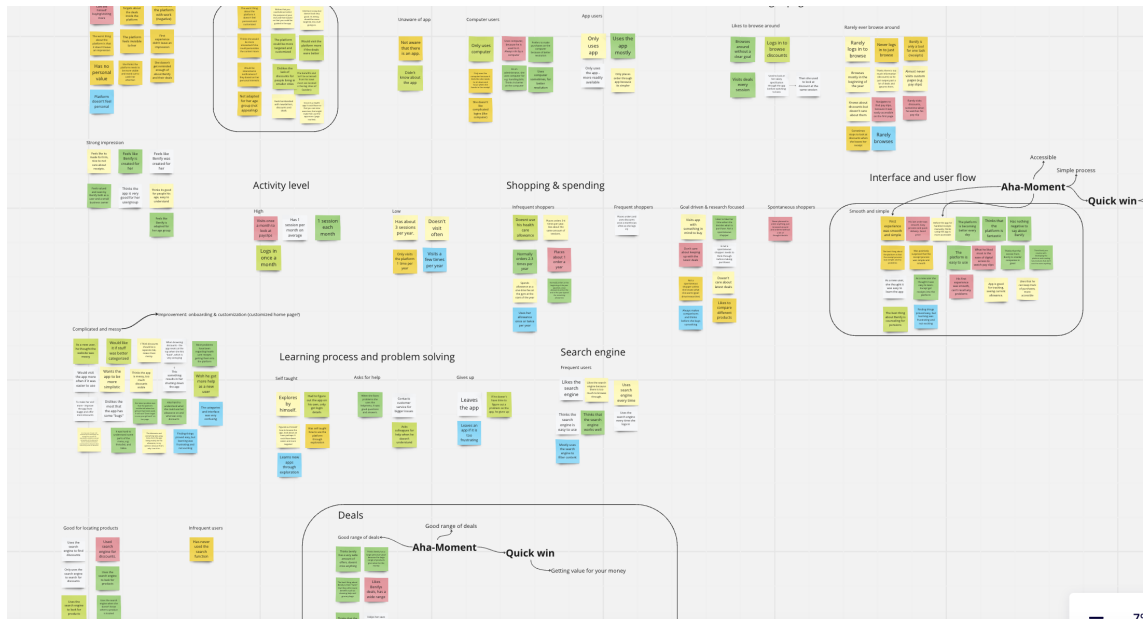


Figure 4.11: Affinity Diagram

Based on recurring themes that could be identified through Affinity Diagramming, statements and short phrases were written down in the form of insights. In total, 25 Insight Statements were created, whereas 5 were labeled as positive feedback, 12 were labeled as negative feedback, and the remaining 8 were labeled as neutral feedback. To narrow down the focus, similar Insight Statements among the positive and negative insights were grouped together into more high-level insight categories. The neutral insights were discarded for this step as they did not translate into neither design challenges nor design opportunities. However, they were saved and kept in mind for upcoming methods, such as the creation of user personas and journey mapping, as they did provide knowledge about the users, their behavior on the platform, and their impression of the platform. Based on the compiled knowledge, five main insight statements could be formulated, and “aha!”-moments, quick wins, design challenges, and onboarding opportunities could be identified. Each insight statement was then formulated as a How Might We statement, in order to serve as a framework for the forthcoming process.

The formulated Insight Statements with their respective How Might We statements were the following:

1. The process of managing payslips, benefits, and tracking purchases is easy through using Benify
 - How might we make users realize how simple and efficient the process of using Benify’s service is?
2. Benify has a large range of good deals with a high value
 - How might we make users realize the large range of valuable deals that Benify offers?
3. There is a lot of confusion regarding how the platform works
 - How might we make it easier to understand how the platform works?

4. The platform is currently not personalized and targeted enough for individual needs
 - How might we make the platform more personalized and targeted towards individual users?
5. Users are quick to abandon a product that they don't like
 - How might we retain users that are struggling on the platform?

By looking at the insight statements, insight 1 and insight 2 were identified as two separate “aha!”-moments for most users. Based on the interviews (see section 5.1.2), it became clear that most users highly mobile appreciated the large range of valuable offers inside the platform, and the easy and simple process of using the platform for administrative tasks such as checking payslips or handing wellness receipts. However, it was also noted that some users failed to experience these “aha!”-moments, simply because they were struggling with understanding and navigating the platform. Furthermore, insights 3, 4 and 5 were regarded as arguments as to why an onboarding phase might be necessary for Benify's platform. Additionally, insight 4 was regarded both as an argument of focusing on more goal-specificity during the onboarding and inside the platform, and as an argument to include a personalization nudge inside the onboarding experience.

In conclusion, using these compilation and analytical methods, a thorough understanding of the platform's issues and delights was developed. It also resulted in a deeper understanding of the users, which was necessary for the following step, where scenario-based design techniques were utilized. Basing the user personas and their respective journey maps and flowcharts on gathered user knowledge helped in the creation of realistic and accurate user profiles.

4.2.2 Scenario-based design techniques

Scenario-based design techniques as suggested by the GDD framework were utilized in order to establish frameworks and gain a better understanding of the users that were being designed for. The primary technique used was user personas, which the rest of the scenario-based design techniques centered around. Three extreme users were created as personas, and each persona was assigned an archetype, journey map, and a flowchart. Each user persona represented typical Benify users attributes, including their core needs, frustrations, technology literacy and personal traits. Figure 4.12 shows one of the user personas created which also is the primary persona. The remaining user personas can be found in the appendix (see figure A.1 and A.3). Developing user personas provided a profound comprehension of general Benify users and a better understanding of the users that were designed for. The personas were prioritized where the primary persona was the one we considered being most representative of the average user, based on the observations that had been made from the data collection and data analysis process. They belonged to one of the biggest user groups by age, and their behavior pattern on the platform was considered similar to the behavior of the average Benify user.

Benify have identified five archetypes using their platform, which were assigned

to each user persona. The following three archetypes were assigned to the user personas identified:

- **The Bargain Hunter:** "Looking for good deals, afraid of missing out. Need to be able to easily navigate to and explore the best offers"
- **One Time Visitor:** "Can be Browsers, Goal Focused, Researchers, or Bargain Hunters. They are unfamiliar with the platform and it's offering. They don't intend to visit again after they've performed what they set out to do. They need good support and understanding of the platform"
- **Goal Focused:** "Knows what they are looking for with a clear mission on what to find. They appreciate efficiency and need easy way-finding including categories, menu behavior and powerful search function"

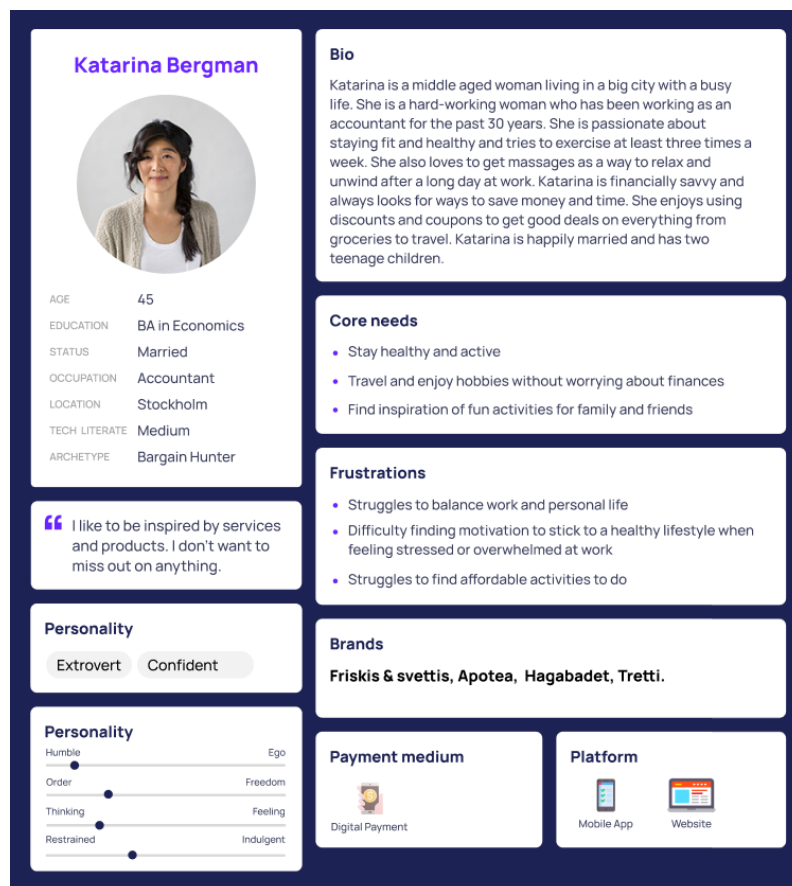


Figure 4.12: User Persona

In order to expose delights and frustrations the user personas experience on the platform, journey maps were created. Furthermore, each persona was given a scenario, such as the one below:

Scenario: Katarina is a new Benify user who is eager to learn more about the training and health related offers. She seeks enjoyable experiences at reasonable costs.

For each user persona, a journey map was created in order to visualize their experience during the fictive scenario. The journey map showed their activity, goals, attitude, expectations and experience in the specific scenario. Journey mapping revealed the locations of the user personas' "aha!"-moments and general pain points. Observing their journeys yielded several design opportunities and onboarding strategies. Figure 4.13 shows the journey map assigned to one of the user personas. The appendix contains the rest of the journey maps (see figure A.2 and A.4) .

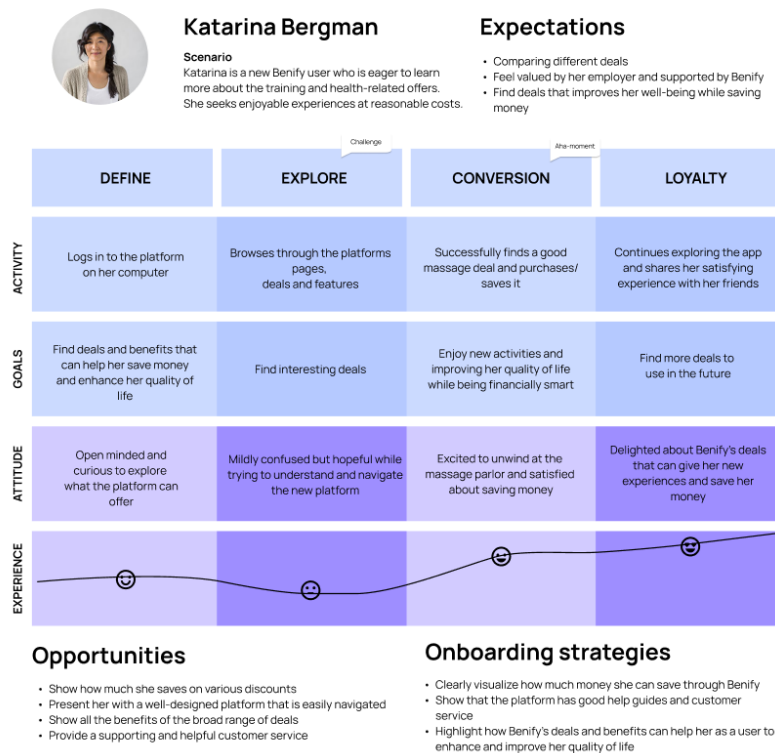


Figure 4.13: Journey Mapping

Lastly, flowcharts were created for each persona. They were based on the same scenario as the journey maps, and in essence conveyed the same journey as the journey maps did. However, the journey maps were better at visualizing the user personas user experience in terms of attitudes. The flowcharts on the other hand, showed a more detailed view of how the personas navigated the platform and on which pages they got stuck or were successful. They also included annotations and tags that explained each user personas expectations, first impression, "aha!"-moments, quick wins, attitudes and experiences, interaction styles, and conclusion to the user journey. Figure 4.14 shows a part of a flowchart for the same scenario as in the journey map above. The remaining flowcharts can be found in the appendix (see figure A.5 and A.6).

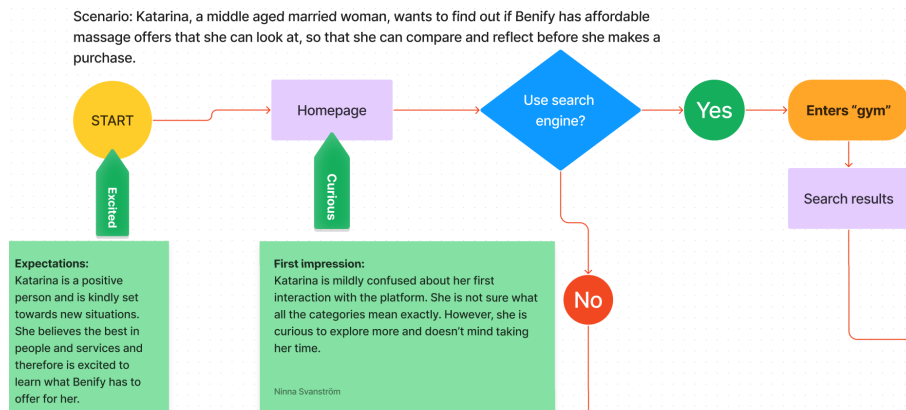


Figure 4.14: A part of a flowchart

A thorough understanding of the users and how they engage with the platform was established through the use of scenario-based design techniques. The insights were useful in the next design step, which involved developing design concepts to be tested on participants.

4.2.3 Onboarding strategy definition

Based on all the collective key findings from the scenario-based design methods and the product teardowns, design strategies for the upcoming prototype of the project were formulated using the previously formulated How Might We statements as a framework.

1. How might we make users realize how simple and efficient the process of using Benify's service is?
 - Value-proposition and "aha!"-moments: Clearly state the value of the mobile app to the user, by explaining how it can help them reach their goals. Let the value propositions serve as "aha!"-moments.
2. How might we make users realize the large range of valuable deals that Benify offers?
 - Value-proposition and "aha!"-moments
3. How might we make it easier to understand how the platform works?
 - In-mobile app tutorials: Implement integrated in-mobile app tutorials that reside within relevant screens for processes that might need extra assistance.
 - Tutorials: Design tutorials that scaffold understanding of the functions inside the platform.
 - Tooltips: Implement a restricted amount of tooltips inside the mobile app to highlight features and aid navigation.
4. How might we make the platform more personalized and targeted towards individual users?
 - Personalization nudge: Implement a personalization nudge to increase goal-specificity and encourage the user to reflect over what they can achieve by becoming a registered user.

- Notifications and newsletters: Implement a screen which asks the user to enable notifications of personal recommendations, and asks the user for permission to send newsletters about the latest campaigns and deals.
5. How might we retain users that are struggling on the platform?
 - Customer support: Support reading to do, study and locate by implementing a help center at the homepage where guides and tutorials can be revisited.
 - Commitment nudge: Implement a commitment nudge to help the user make tangible progress, guide them towards a quick win, and to encourage action-oriented learning.
 6. Other
 - Simple sign-up: Streamline the sign-up and registration process by keeping the user inputs to a minimum. Only ask the user to enter essential input in order for them to be able to enter the platform.

4.3 Implementation

During this step, the designers get the chance to implement their final solution to test what impact it has in the real world [34]. Based on the insights from the data analysis and design challenges and opportunities that surfaced from the user personas and their respective journey maps and flowcharts, prototype variations of an onboarding which addressed these design challenges and opportunities were created. To invite users for collaboration, feedback of the prototypes were collected which in turn guided following iterations of the prototypes. Based on the iterations, a wireframe of the final solution was created which served as a sketch of the infrastructure for the final design.

4.3.1 Iterative prototyping

Based on all of the feedback, insights, and results from previous methods, nine design concepts were generated in Figma, a collaborative web application for interface design [24]. As recruiting 5 participants have been proven to be enough to reach saturation in usability tests [60], 5 participants were recruited to look at the prototypes and express their opinions about them. The participants were recruited through convenience sampling, where one of them was a Benify user.

The participants were informed that each feedback session could take up to an hour and that their personal information would be kept anonymous. In total 14 iterations were carried out over the course of three feedback sessions. In the first feedback session, nine iterations were tested. In the second feedback session, five more iterations were tested. During the third and final feedback session, wireframes of the design flow were tested. Many of the iterations included at least two alternatives of a prototype with slightly different design techniques, which the participants were asked to compare and evaluate. The participants were asked to disassemble the

prototypes and express what features they liked more or less in each alternative, express their opinions regarding the value of the prototypes, and give suggestions of improvements. As the prototypes were low-fidelity, the participants were asked to specifically focus on the functionality, content, and value of the screen, and try to disregard visual elements such as aesthetics and the UI. To eliminate primacy bias [81], the order in which all versions were presented was distributed across participants. The feedback that was given by the participants guided the forthcoming iterations.

The feedback sessions followed a semi-structured approach. The participants were asked a number of questions regarding the prototype, but were asked follow-up questions based on their answers. Furthermore, the participants were asked to think out loud while they interacted with the prototypes. The most frequently recurring questions were:

1. Which alternative do you prefer and why?
2. How did this design make you feel?
3. How did you feel about [a specific feature in the design]
4. Was it complicated or simple to understand the design?
5. What do you expect from the app from seeing these screens?
6. Would you like to:
 - (a) add something?
 - (b) remove something?
 - (c) change something?

However, most iterations included more questions which were specifically related to the prototype that was being tested. The researcher took notes of the participants' feedback, which was compiled inside a word document. Based on the notes, summaries of each prototype were created which exposed possible improvements, which in turn guided further iterations of the prototypes. The assessment that saturation had been reached for the iterative prototyping feedback sessions was made when the participants had no more feedback to give.

4.3.1.1 Feedback session 1

For the initial feedback session, the onboarding strategies that were tested were the following:

- Value proposition, key features and "aha!"-moments
- In-mobile app tutorial
- Tutorials
- Tooltips
- Personalization
- Notifications and newsletters
- Customer support
- Commitment nudge
- Simple registration and sign-up process

4.3.1.1.1 Iteration 1.1: Value Proposition, key features and "aha!"-moments

Some users struggled to experience an “aha!”-moment and could therefore not realize what value the platform could provide them. Therefore, two versions of screens that communicate how the users will benefit from using the platform were created (see Figure 4.15).

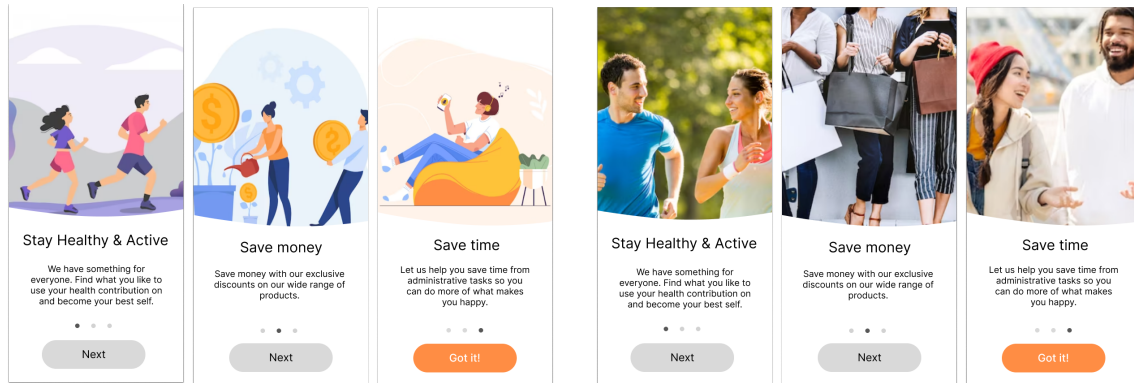


Figure 4.15: Two alternatives to the value proposition

The results from the feedback was the following:

- Illustrations were preferred over stock images, as they felt more casual and friendly.
- The titles and the descriptions were mobile appreciated, as it gave a good first impression of the platform and raised the expectations.
- The descriptions would benefit from being more simple and straight forward.
- The first screen could be less fitness related and more wellness related.

4.3.1.1.2 Iteration 1.2: In-mobile app tutorial Interviewees expressed that registering their wellness receipts was surprisingly simple but that it initially seemed like an overwhelming and complicated process. Moreover, the interviewees confirmed the observation that making larger tasks on the mobile app felt more unsafe compared to the computer. A prototype of an instruction screen describing steps taken to handle their wellness receipts was created to give the users extra guidance and increase feelings of safety. Additionally, two versions of a screen that congratulated users on a successful order and displayed information about how much wellness allowance they had remaining was also created, to create a positive conclusion (see Figure 4.16).

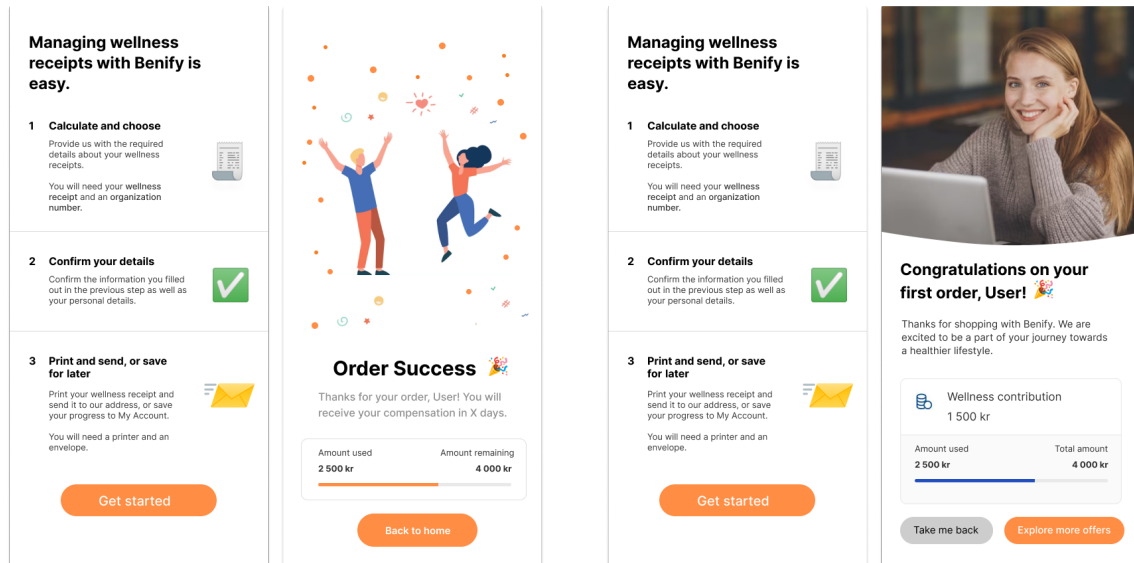


Figure 4.16: Two alternatives to an in-mobile app tutorial

The results from the feedback was the following:

- Participants liked the idea of introducing a simple overview of the process of handling wellness receipt to a new user.
- However, some participants expressed uncertainty towards including a guide, stating that it might be redundant.
- Participants mentioned that the text could be even more clear.
- All participants preferred the illustration the over stock image.

4.3.1.1.3 Iteration 1.3: Tutorials One prevalent complaint from interviewees was that it was difficult to find what they were looking for on the platform. Specifically, differentiating between the categories inside the benefits page was confusing to many. To address this, tutorials that introduce the different categories in the benefits page were created. Participants were presented with two versions, where one included a looping animation that shows how to navigate a page in the mobile app. The other version included a four-step tutorial made out of image slideshows and explanations of navigation (see Figure 4.17).

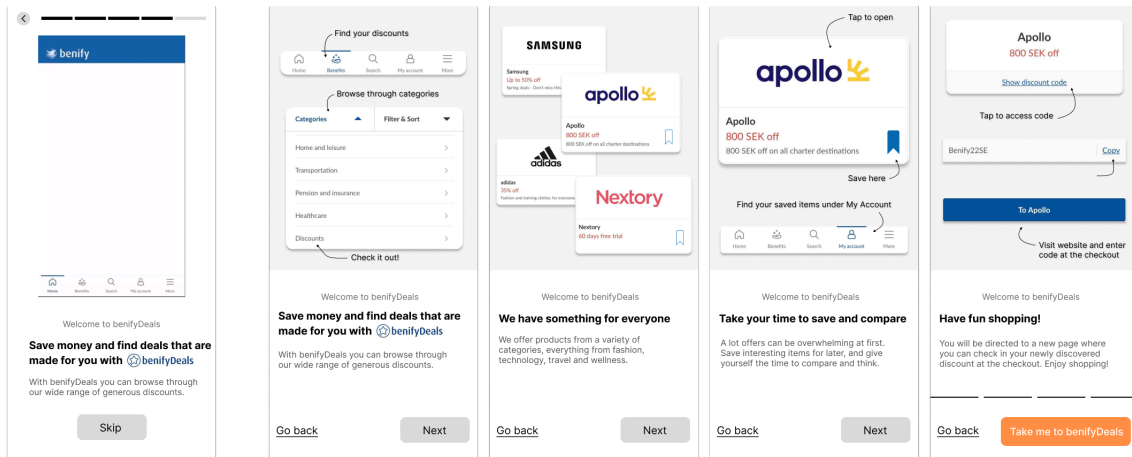


Figure 4.17: Two alternatives to a tutorial

The results from the feedback was the following:

- Animations were preferred over image slideshows, as it is a more compact and efficient way of communicating a lot of information.
- Most of the participants did not like the idea of the animations residing inside the initial tutorial, and especially not if it would mean that a number of animations would be presented in a sequence. Instead, they preferred animations to be located inside the mobile app in the screens relevant to what was being shown.
- One participant mentioned that the animation could be more clear by playing at a slower speed, include a cursor and better signalize clicks, and include a progress bar to clarify when the animation starts and ends.

4.3.1.1.4 Iteration 1.4: Tooltips As previously stated, several interviewees experienced difficulties navigating the mobile app. Therefore, two versions of tooltips were designed to help users navigate the mobile app. The only difference between the two versions was that the first included an overlay to draw the user's attention to the tooltip, and the other version did not use overlays.

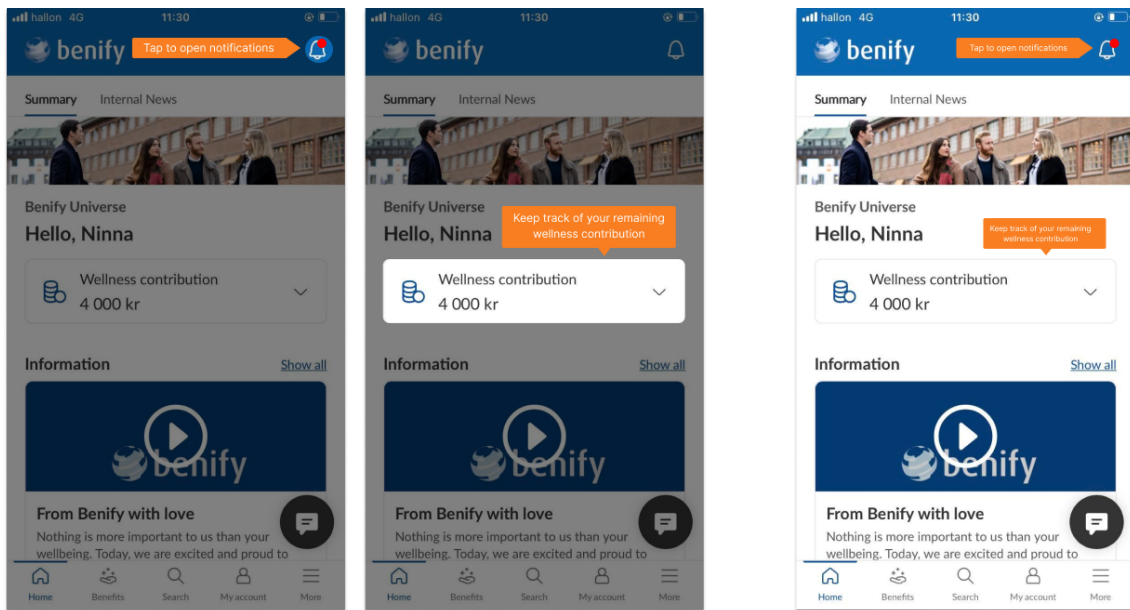


Figure 4.18: Two alternatives to tooltips

The results from the feedback was the following:

- The majority of the participants did not prefer overlays, as they felt that it violated their freedom of exploration. They preferred tooltips to act as passive and silent support, and be used in moderation.
- Some participants also thought that the tooltips could be larger, more clear, and easier to understand.

4.3.1.1.5 Iteration 1.5: Personalization Some respondents mentioned a desire to personalize the platform. To create a personalization nudge, a screen which asks users to enter their interests and goals was prototyped (see Figure 4.19). The assumption was that users would mobile appreciate being able to customize the experience, and start reflecting over their goals and what they could achieve by using Benify, by being prompted to enter this type of information during the onboarding experience. Following these screens, participants were shown two versions of a screen which confirmed that the platform had registered their input. Two versions were created, where one simulated a loading screen that was busy customizing the experience, and the other one included bullet points that highlighted the value of using Benify's platform. This feedback was thought to increase goal-specificity, and to once again emphasize the value of the platform.

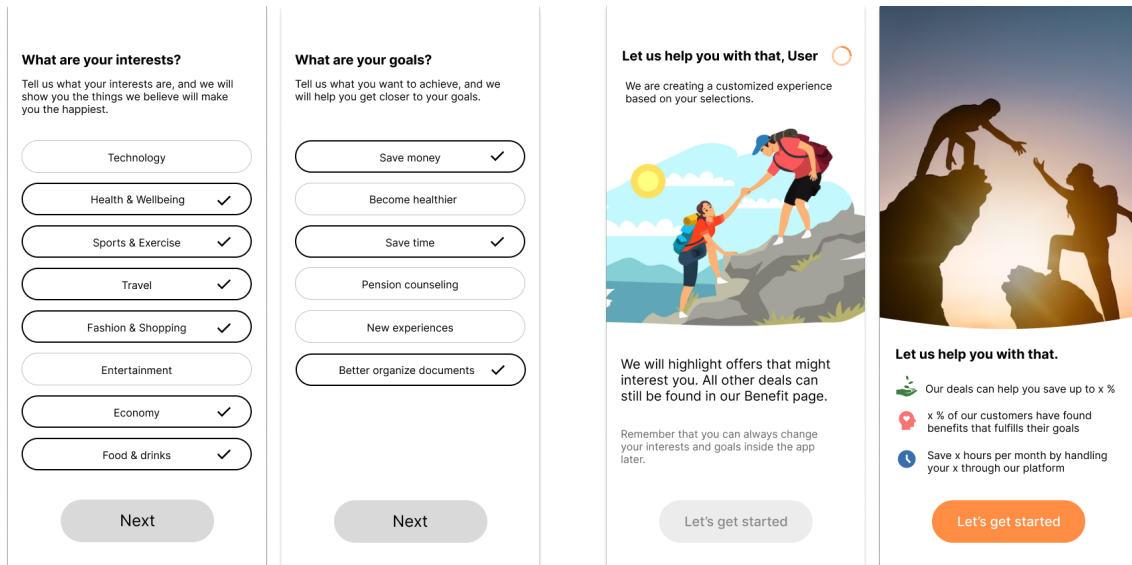


Figure 4.19: Personalization nudges, with two alternatives to confirming the user input

The results from the feedback was the following:

- All participants were positive towards allowing users to personalize the interface.
- One participant pointed out that it should be more clearly stated that this step is skippable and not compulsory to fill out, as some users may not know what they are interested in as they are entering the platform for the first time.
- The participant also mentioned that there should not be a minimum nor maximum amount of options that the user can choose from, and that the screen should clearly state that these settings can be changed later
- All the participants agreed that the confirming message with the progress wheel was preferred, as it looked less like advertisement and made it feel like the interface was customizing the experience.
- All the participants preferred illustrations over stock images.

4.3.1.1.6 Iteration 1.6: Notifications and newsletter Receiving notifications and newsletters is essential for onboarding because it can engage dormant users [32]. Participants were given two versions of a screen with a description of notifications and newsletters, as well as the option to subscribe or not. Version one allowed users to enable only one of the options if desired, however version two had a single button that enabled both notifications and newsletters (see Figure 4.20).

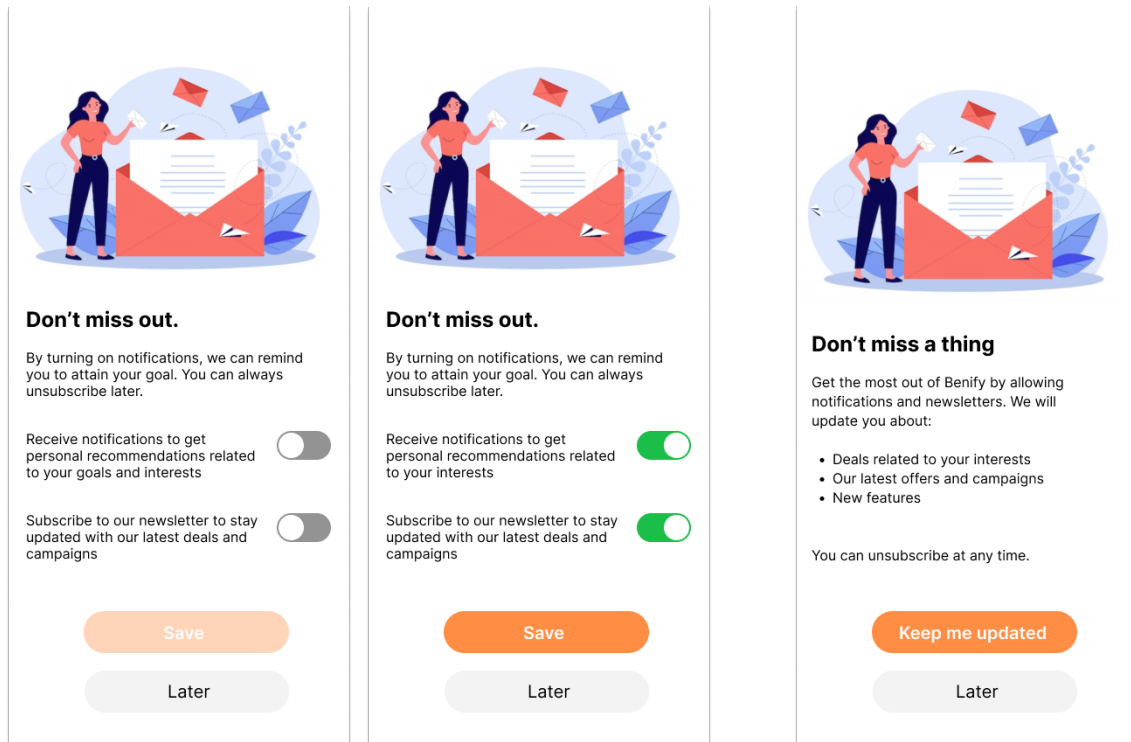


Figure 4.20: Two alternatives to notifications

The results from the feedback was the following:

- All the participants preferred the first alternative, where they could customize the settings according to their preference.
- One participant mentioned that the text was wordy and could be shortened.

4.3.1.1.7 Iteration 1.7: Customer support Since interviewees expressed that it was challenging to navigate the mobile app, a prototype of a screen which was intended to include all the onboarding steps was created (see Figure 4.21). The page would be accessed through the homepage, where the onboarding could be revisited, in case the user had quickly skipped through the process or would like to return to refresh their memory.

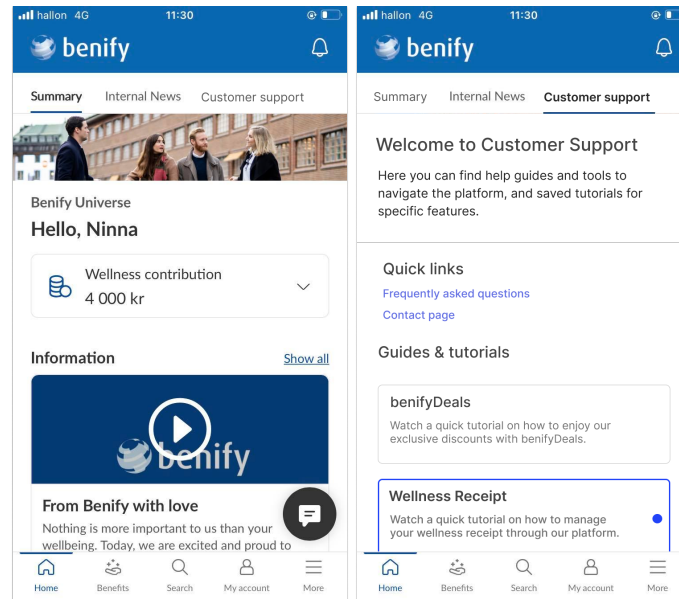


Figure 4.21: Customer support

The results from the feedback was the following:

- All the participants were in great favour of having an accessible customer support page. They especially liked that it was a part of the onboarding strategy, by including onboarding guides that the user could revisit.
- Some participants thought that "Customer support" did have misleading connotations, and thought that a term including the word "Help" would be more mobile appropriate.
- Some participants argued that the design of the page could be simplified by better distinguishing different onboarding categories.

4.3.1.1.8 Iteration 1.8: Commitment nudge A commitment nudge was created to both use action-oriented learning, and to investigate how users responded to committing to a seemingly trivial activity in order to maximize the likelihood of committing to the larger assignment of becoming an active user. The chosen task was to follow a guide of how to search for and save an offer (see Figure 4.22).

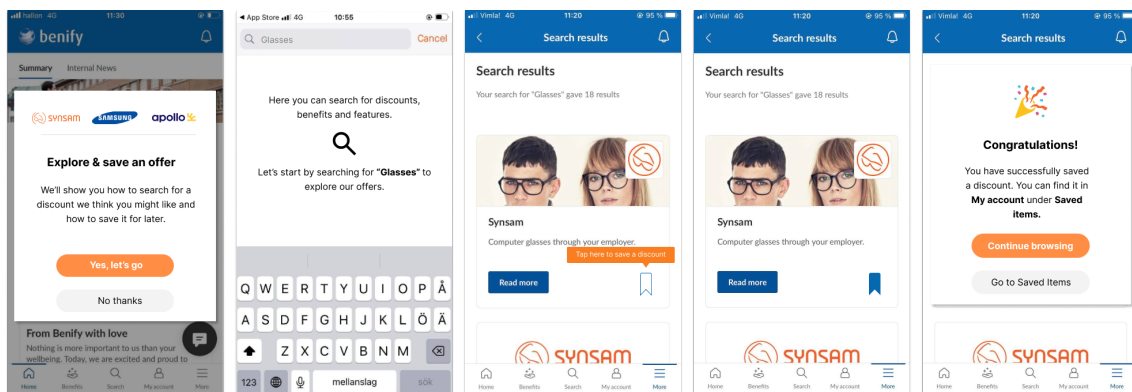


Figure 4.22: Commitment nudge

The results from the feedback was the following:

- All the participants liked the save function.
- Participants were in disagreement of the execution of the commitment nudge. All participants agreed that it was pedagogical, helpful, and cheerful with the congratulating message, but some believed it to possibly be too invasive and pushy by immediately demanding attention on the first visit to the platform.
- One participant wanted the onboarding to include an option where the user could choose to either see or skip guides like this one.
- One participant thought that a nudge like this should not mobile appear immediately as a new user explores a platform, but rather on the third or fourth visit if the user has not yet used the search engine or save function.
- Some participants stated that the design of the prototype could be mistaken for advertisement.

4.3.1.1.9 Iteration 1.9: Simple registration and simple sign-up process

The assessment was made that Benfy's current registration process could be more streamlined and minimalistic. Two versions of the registration process were generated (see Figure 4.23), where only the essential input needed to enter the platform was included. Participants were asked if they preferred having all of the input on the same screen or divided into two screens. Participants were also shown two different versions of a password selection screen (see Figure 4.24). In one version the user must write their password twice to confirm it. In the second version, they only had to write it once, with the option to check spelling with a Show/Hide function. Additionally, the list of requirements were redesigned to give dynamic feedback whenever a requirement had been met, instead of presenting as a static list.

4. Process

Tell us about yourself
Alright, let's set this up! First, introduce yourself to us.

What is your first name?
Enter your first name here

What is your last name?
Enter your last name here

What is your social security number?
Enter social security number here

Continue

Contact information
We need your email address so we can reach you.

Private email address
Enter your private email address here

Work email address
Enter your work email address here

Continue

Tell us about yourself
We need your email address so we can reach you.

What is your first name?
Enter your first name here

What is your last name?
Enter your last name here

What is your social security number?
Enter social security number here

Private email address
Enter your private email address here

Work email address
Enter your work email address here

Continue

Figure 4.23: Two alternatives to contact information

Set a new password
Your new password needs to fulfill these requirements:

- Can't include your first name or last name
- Needs to contain at least 8 characters
- The characters can't be repeated more than twice
- It needs to contain at least two numbers
- It needs to contain at least two letters
- You can't use a password that you have used the last 36 months

New password
Enter your password here

Confirm password
Confirm your password here

* Your password is valid for 36 months. You will receive a reminder to update your password 30 days before it expires.

Continue

Set a new password
Your new password needs to fulfill these requirements:

- Can't include your first name or last name
- Needs to contain at least 8 characters
- The characters can't be repeated more than twice
- It needs to contain at least two numbers
- It needs to contain at least two letters
- You can't use a password that you have used the last 36 months

New password

Confirm password

* Your password is valid for 36 months. You will receive a reminder to update your password 30 days before it expires.

Continue

Set a new password
Your new password needs to fulfill these requirements:

- Can't include your first name or last name
- Needs to contain at least 8 characters
- The characters can't be repeated more than twice
- It needs to contain at least two numbers
- It needs to contain at least two letters
- You can't use a password that you have used the last 36 months

New password
••••••••

* Your password is valid for 36 months. You will receive a reminder to update your password 30 days before it expires.

Continue

Set a new password
Your new password needs to fulfill these requirements:

- Can't include your first name or last name
- Needs to contain at least 8 characters
- The characters can't be repeated more than twice
- It needs to contain at least two numbers
- It needs to contain at least two letters
- You can't use a password that you have used the last 36 months

New password
Benify123

* Your password is valid for 36 months. You will receive a reminder to update your password 30 days before it expires.

Continue

Figure 4.24: Two alternatives to password details

The results from the feedback was the following:

- All of the participants preferred the registration process where the inputs were divided in two screens, as it became less overwhelming and more concise.
- The majority of the participants were in favour of including a "Confirm password" input, but keeping the "Show/Hide" icons as well to increase the sense of control.

- One participant mentioned that the password input should reside above the requirements list to attract attention, as it is the primary element of the screen and the requirements are secondary.
- All of the participants were all very positive towards the dynamic feedback from the password requirements list, and agreed that it was an effective way of supporting the process of entering a password with many requirements.

4.3.1.1.10 Key takeaways The majority of the participants were in favour of the onboarding design, with some suggestions of improvements. Along with the suggestions, some general key takeaways from the feedback session was noted, in order serve as guides the upcoming iterations. The key takeaways were the following:

- The participants agreed that the prototypes were pedagogical, helpful, and user friendly.
- Some participants stated that the onboarding was slightly too long, and could be scaled down or more embedded inside the interface.
- One participant was particularly hesitant towards designing an onboarding that users are forced to complete. They in particular emphasized the importance of giving the users the freedom to explore. This participant argued that it is important to make the onboarding as skippable as possible, and suggested to implement a feature which gives the user the option to either follow or skip the onboarding completely. The participant also stressed the importance of making it easy for users who decided to skip the tutorials to able find them again at a later stage.

4.3.1.2 Feedback session 2

For the second feedback session, the suggestions of improvements and key takeaways from the previous feedback session had been considered and guided the second round of iterations. The prototypes that were tested for this session were the following:

- Password selection
- Interface tutorials
- Possibility to skip tutorials and guides
- Help center

4.3.1.2.1 Iteration 2.1: Password selection Feedback from the first iteration resulted in two versions of the password screens. The user is requested to write and confirm their password in both versions, while also having access to the Show/Hide feature. However, in one version, the list of password requirements reside below the password inputs, whereas in the second version, it reside below the password inputs (see Figure 4.25).

The results from the feedback was the following:

- All of the participants liked the "Show/Hide" option combined with the "Confirm password" input, as it they argued it could scaffold memory and control.
- All of the participants preferred to have the password input to be above the requirements list.

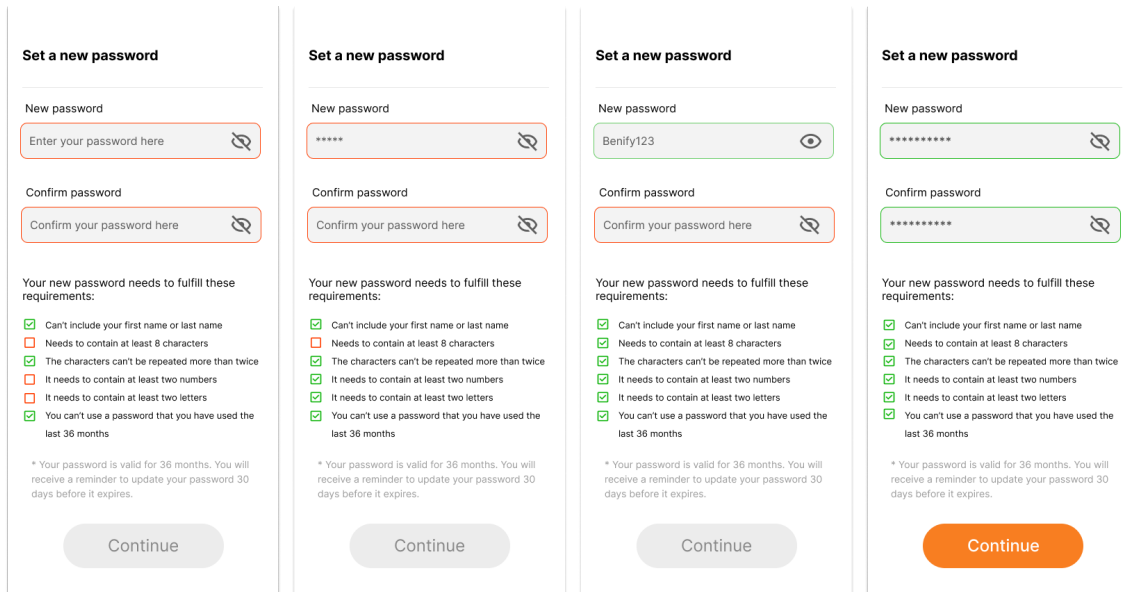


Figure 4.25: Password selection

4.3.1.2.2 Iteration 2.2: Interface tutorials To clarify when the looping animation starts and ends, a progress bar displaying the length of the animation was added. A cursor and gestures were animated as well, and the speed of the animation was decelerated to make it more easy to follow (see Figure 4.26). Moreover, the participants were informed that this kind of animation would not mobile appear in the initial onboarding phase, but inside the mobile app in relevant screens.

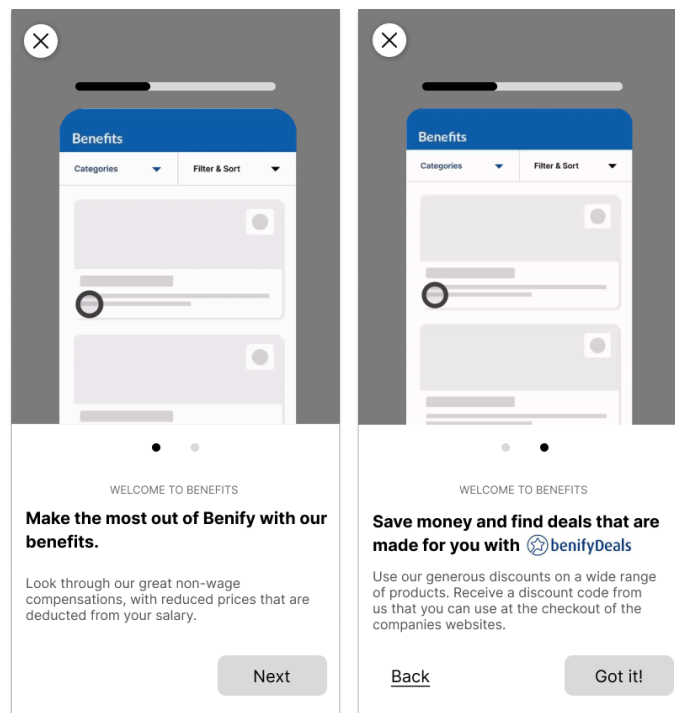


Figure 4.26: Interface tutorials

The results from the feedback was the following:

- All of the participants liked the idea of having the animation reside inside the platform, instead of being a part of the initial tutorial. They agreed that it supported exploration, increased goal-specificity, scaffolded learning, and made the first experience less overwhelming.
- All of the participants thought that including a cursor, showing clicks, and implementing a progress bar improved the understanding of the animation.
- Some participants thought that the descriptions below the animations could be improved to better distinguish between the different features that the animations showed.

4.3.1.2.3 Iteration 2.3: Possibility to skip tutorials and guides During the first round of iterations, some participants expressed that the onboarding flow was slightly too long, with an abundance of tutorials and tooltips. One participant argued that having the option to skip guides and tutorials was important. As a result, two versions of a screen which asks the users whether they want to receive assistance or not was created. One version was a full screen prototype which would reside within the initial onboarding phase, and the other version was created as a modal which would mobile appear when the user entered the platform (see Figure 4.27). The tutorials and guides that would be skippable would refer to the ones that would be embedded inside the platform and not included inside the initial onboarding phase.

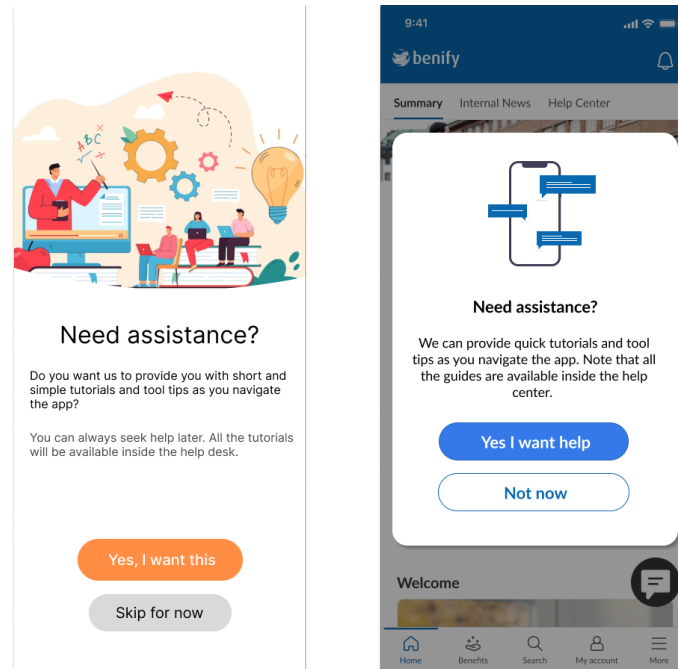


Figure 4.27: Two alternatives of giving the user the possibility to skip tutorials and guides

The results from the feedback was the following:

- All of the participants liked the idea of being presented with the option of following or skipping tutorials. They recognized the fact that some people may need assistance, whereas some other people need to have the freedom of exploring a platform without disturbing and nudging elements.
- The majority of the participants preferred the modal rather over the full screen design.

4.3.1.2.4 Iteration 2.4: Help center The prototype of the Customer Support page was redesigned to simplify navigation further, and the page's name was changed to "Help Center" (see Figure 4.28). The content inside the help center was more distinguished by being more separated into different chapters.

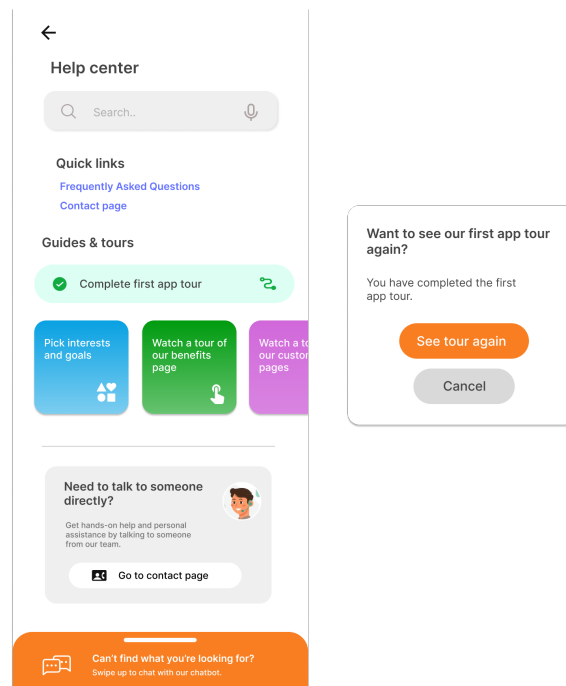


Figure 4.28: Help center

The results from the feedback was the following:

- All of the participants liked the new design, as it increased curiosity and clearly showed that the different categories represented unique steps in the onboarding.
- Some of the participants expressed that they mobile appreciated the feedback that explained whether the onboarding had been fully completed or not.

4.3.1.3 Feedback session 2

The third and final feedback session involved presenting the participants to low-fidelity wireframes of the final design, in order for them to assess the workflow.

4.3.1.3.1 Iteration 3.1: Wireframes Low-fidelity wireframes which represented the workflow of the design were implemented in Figma. The participants

were guided through all the screens in chronological order and asked to give their input. All the participants were in agreement that the workflow was logical and well-designed, and had no further critique. Thus, the assessment was made that full saturation for the collaborative prototyping had been reached. Based on the wireframes, a high-fidelity prototype of the onboarding was created in Figma which followed design principles and laws from HCI research, and Benify's own design system and component library. A mock-up of their platform with limited interaction possibilities was also created in Figma, as well as a mock-up of their current onboarding phase on their mobile application, which was to be used for the upcoming A/B testing.

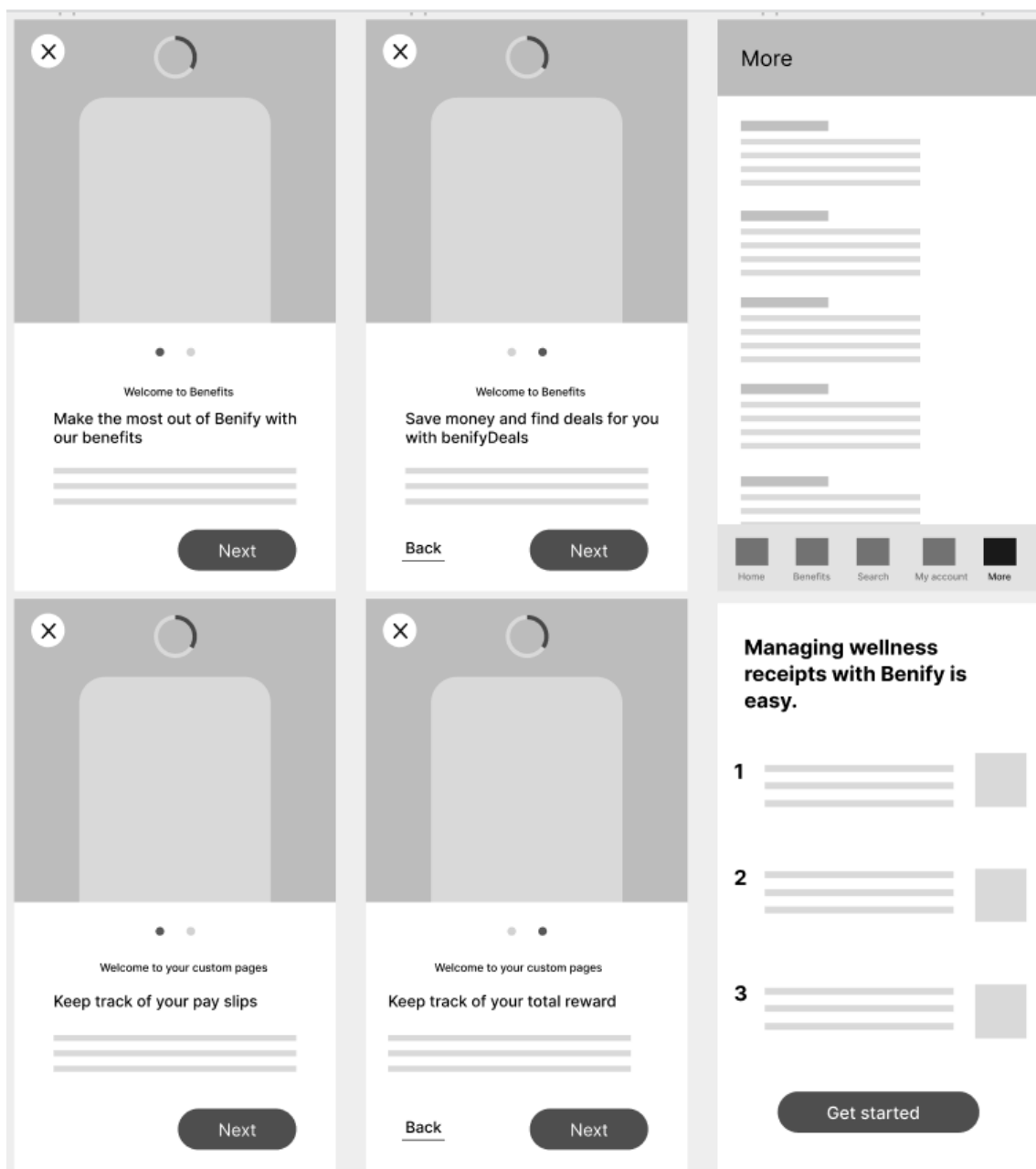


Figure 4.29: A snapshot of a part of the wireframes

4.4 Evaluation

The purpose of this phase was to evaluate the final design through A/B testing with recruited participants, and a heuristic evaluation method conducted by the researchers. The aim of the A/B test was to investigate whether the new onboarding version compared to the old onboarding version would increase the participants perceived usability and motivation of using the mobile app again. The aim of the heuristic evaluation was to evaluate if the final design had fulfilled established usability principles and laws.

4.4.1 A/B Testing

An A/B test was created using the software Maze to test the final prototype. The A/B test included two conditions: a control group which was exposed to a mock-up of Benify's current onboarding design, and an experiment group which was exposed to the new onboarding design. Participants were recruited through convenience sampling, and through the social media platforms Reddit and Facebook. Before the test was launched, it went through two pilot studies with two members of Benify's UX team in order to identify any confusions, pitfalls, and improvements.

4.4.1.1 Introduction to the test

Both groups followed a similar introduction protocol, (see figure A.9, A.10, and A.11 in the appendix). The participants were invited to participate in the test through clicking on a URL. When they opened the URL, they were first introduced to a consent form which explained how research was going to be conducted, the requirements to participate, and finally asked the participants to confirm that they met the necessary requirements, and to give their consent to participate. After they had given their consent, they were greeted with a default welcome screen from Maze which briefly explained how A/B tests in Maze works.

4.4.1.2 Test conditions

After the welcome screen, the participants were exposed to a research participant agreement in which they were informed about the terms and had to approve to continue. Subsequently, an introduction screen stated: *"You will be presented with a scenario and directed to interact with an app. Following that, you will do a brief task linked to the scenario. Finally, you will respond to eight survey questions about your experience."*

After the participants had read the scenario, they were exposed to their respective conditions. Both groups completed their respective onboarding phases by interacting with the prototypes. As the onboarding phases included two separate steps - the first step being an initial tutorial before entering the platform, and the second step being tutorials from within the platform - the onboarding phase in the test was also separated into two different steps. First, the users interacted with the initial tutorials. Following the completion of the first interaction, another educational screen

appeared to divide the two onboarding phases. This instructive screen informed users that they had finished the first onboarding stage of creating their account and were about to enter the platform and begin the second step of onboarding. Furthermore, depending on which condition they belonged to, the two groups were required to accomplish two different activities. The control group was instructed to locate an onboarding video on the homepage, open it, and watch or skip it as desired. The experiment group was instructed to follow the interface guidance to complete the rest of the platform onboarding. The guides appeared on the screen as tooltips, modals, and full-screen animations. The A/B test did not include all the prototyped screens of the new onboarding design, as some did not fit into a natural and logical flow of interaction inside Maze. The remaining screens can be found in the appendix (see Figure A.8).

4.4.1.3 Task

When all the participants from both groups had successfully completed the interactions, they were exposed to another screen which informed them that the onboarding phase was complete and were asked to complete a short task. The task asked the participants to find and save a discount of choice. After they had confirmed that they understood the task, they were introduced to a semi-interactive mock-up of the platform. When the participants had found and saved a discount of their choice, the task was registered as completed. If the participants wanted to give up the task, they could press a button on the screen with the label “Stop task”.

4.4.1.4 Survey questions

After being exposed to the task, the participants were asked to fill out 8 survey questions as a final step of the test. The questions were presented with a 5-point Likert-scale reaching from “Highly disagree” to “Highly agree”, except the last question which reached from “Very bad” to “Very good”. The questions were included to examine participants’ perceived motivation, engagement, and comprehension of the application, and to explore their opinions about being able to save discounts in the app, which is a new feature that Benify was currently launching. In order to avoid leading questions, the questions were formulated so that every other question had positive connotations, and every other question had negative connotations. The survey questions were the following:

1. I feel that it was difficult to complete the task
2. I feel motivated to use my wellness contribution on the app
3. I feel that it was difficult to understand the app
4. I think that I would like to use this app again
5. I feel like I would need more assistance to understand the app
6. I feel like the app is personalized for me
7. I think that being able to save deals is useful
8. How was your experience using the app?

An A/B Test provided information on what participants felt about various aspects of the design. However, a final evaluation technique was performed to assess the design's usability, which is described in the following section.

4.4.2 Heuristic Evaluation

To evaluate how well the design fulfills fundamental usability principles, the method 10 Usability Heuristics for User Interface Design [61] was conducted. The usability heuristics that were analyzed were the following:

- 1. Visibility of system status:** The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.
 - Communicate clearly to users what the system's state is — no action with consequences to users should be taken without informing them.
 - Present feedback to the user as quickly as possible (ideally, immediately).
 - Build trust through open and continuous communication.
- 2. Match between the system and the real world:** The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.
 - Ensure that users can understand meaning without having to go look up a word's definition.
 - Never assume your understanding of words or concepts will match that of your users.
 - User research will uncover your users' familiar terminology, as well as their mental models around important concepts.
- 3. User control and freedom:** Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.
 - Support Undo and Redo.
 - Show a clear way to exit the current interaction, like a Cancel button.
 - Make sure the exit is clearly labeled and discoverable.
- 4. Consistency and standards:** Users should not have to wonder whether different words, situations, or actions mean the same thing.
 - Follow platform and industry conventions.
 - Improve learnability by maintaining both types of consistency: internal and external.
 - Maintain consistency within a single product or a family of products (internal consistency).
 - Follow established industry conventions (external consistency).

- 5. Error prevention:** Good error messages are important, but the best designs carefully prevent problems from occurring in the first place. Either eliminate error-prone conditions, or check for them and present users with a confirmation option before they commit to the action.

 - Prioritize your effort: Prevent high-cost errors first, then little frustrations.
 - Avoid slips by providing helpful constraints and good defaults.
 - Prevent mistakes by removing memory burdens, supporting undo, and warning your users.
- 6. Recognition rather than recall:** Minimize the user’s memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another. Information required to use the design (e.g. field labels or menu items) should be visible or easily retrievable when needed.

 - Let people recognize information in the interface, rather than forcing them to remember (“recall”) it.
 - Offer help in context, instead of giving users a long tutorial to memorize.
 - Reduce the information that users have to remember.
- 7. Flexibility and efficiency of use:** Shortcuts — hidden from novice users — may speed up the interaction for the expert user so that the design can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

 - Provide accelerators like keyboard shortcuts and touch gestures.
 - Provide personalization by tailoring content and functionality for individual users.
 - Allow for customization, so users can make selections about how they want the product to work.
- 8. Aesthetic and minimalist design:** Interfaces should not contain information that is irrelevant or rarely needed. Every extra unit of information in an interface competes with the relevant units of information and diminishes their relative visibility.

 - Keep the content and visual design of UI focused on the essentials.
 - Don’t let unnecessary elements distract users from the information they really need.
 - Prioritize the content and features to support primary goals.
- 9. Help users recognize, diagnose, and recover from errors:** Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.

 - Use traditional error-message visuals, like bold, red text.
 - Tell users what went wrong in language they will understand — avoid technical jargon.
 - Offer users a solution, like a shortcut that can solve the error immediately.

10. Help and documentation: It's best if the system does not need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.

- Ensure that the help documentation is easy to search.
- Whenever possible, present the documentation in context right at the moment that the user requires it.
- List concrete steps to be carried out.

5

Results

This chapter will present the end results of this thesis, which consists of the final prototype design, as well as the results from the A/B test and the heuristic evaluation. Based on the collected findings and insights throughout the design process, guidelines of how to design an onboarding experience have been formulated and will lastly be presented in this section.

5.1 Final design

In this section, the final prototype of the new onboarding design will be presented. The final prototype is divided into two parts: the registration which the user interacts with before entering the platform, and in-app guides while the user is inside the platform. The design decisions were based on the findings gathered throughout the design process, specifically the onboarding frameworks collected during the literature study, and insights gathered through the qualitative research methods. The prototypes will be presented in chronological order.

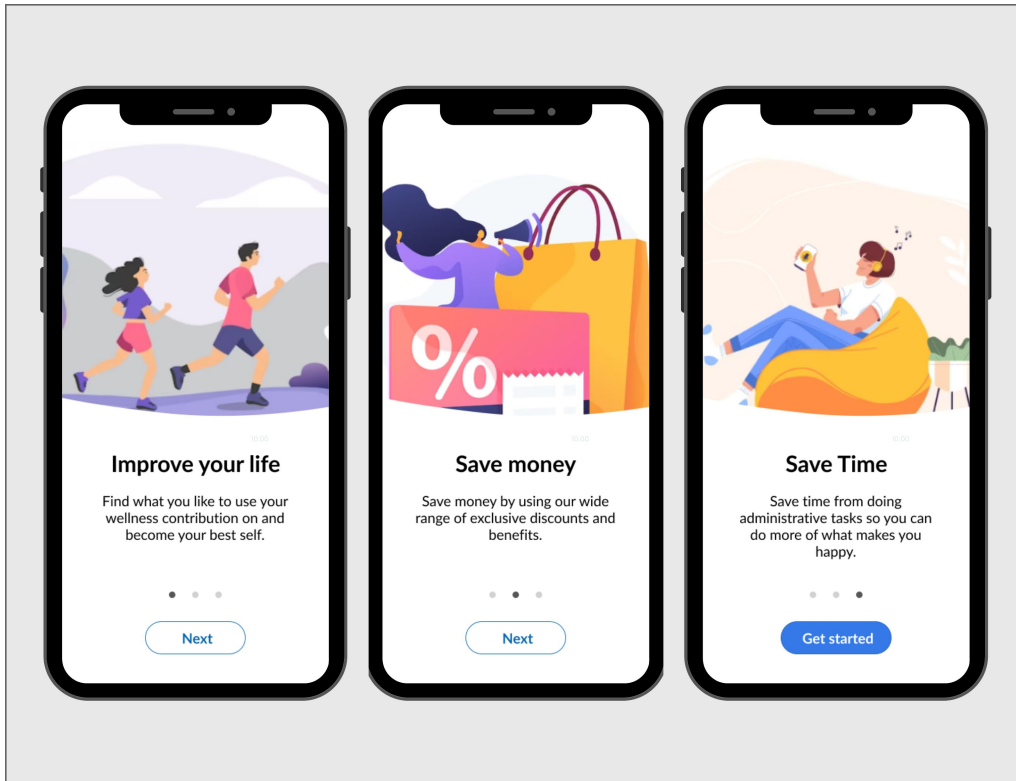


Figure 5.1: Registration: Value proposition

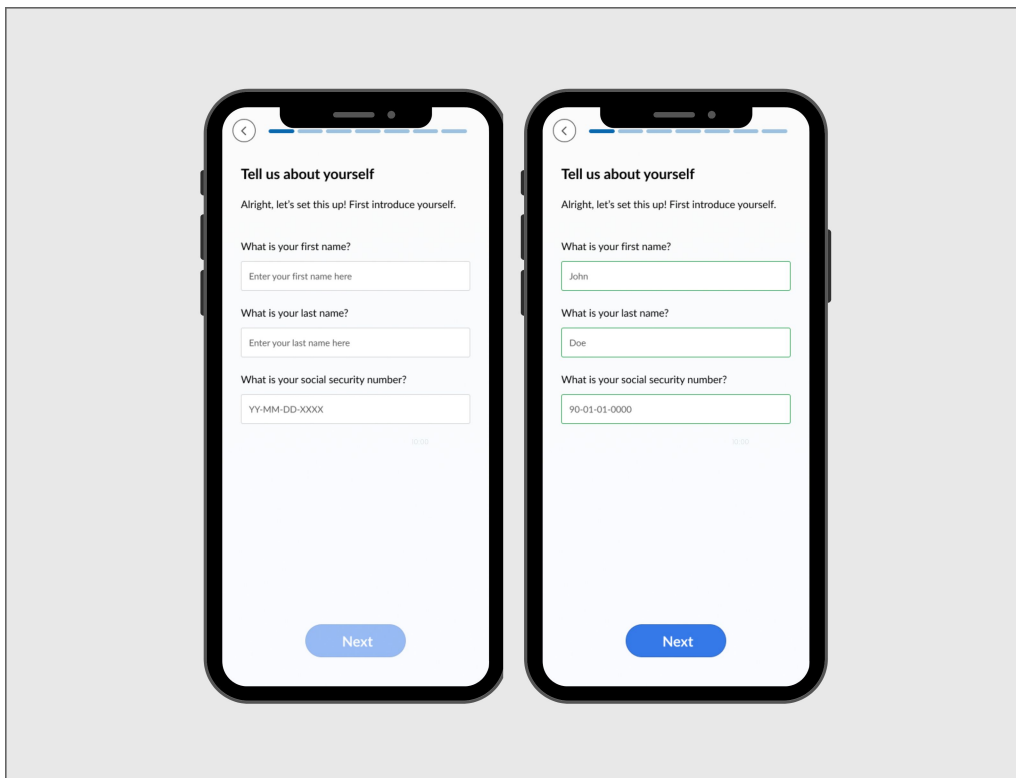


Figure 5.2: Registration: Personal information

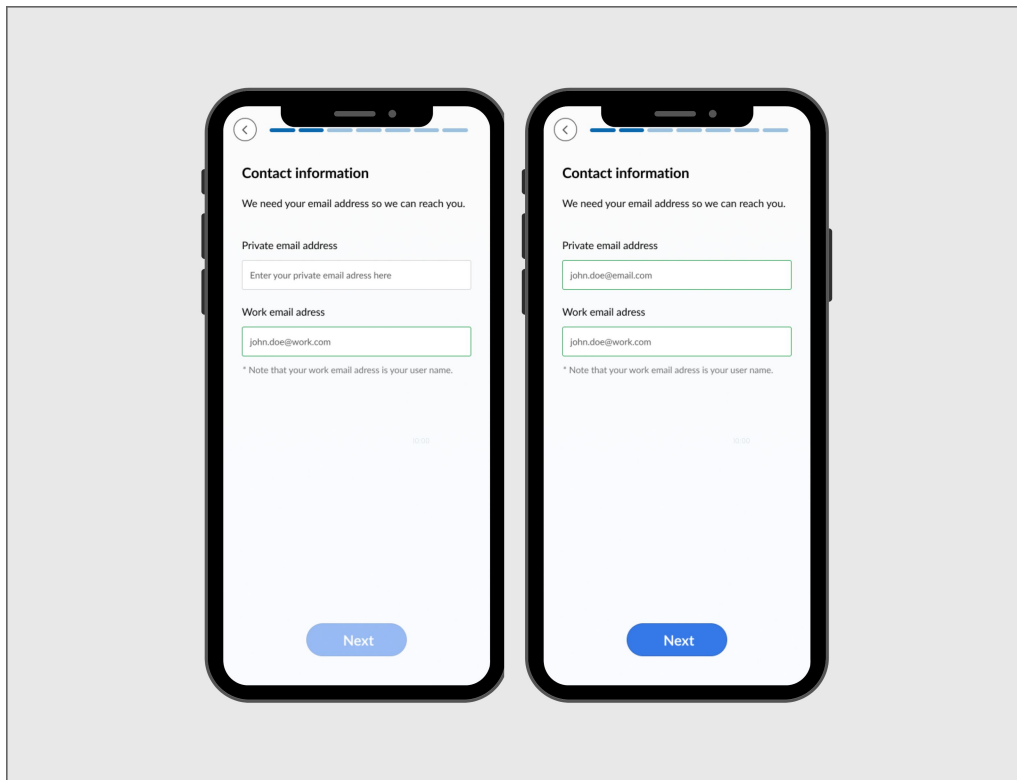


Figure 5.3: Registration: Contact information

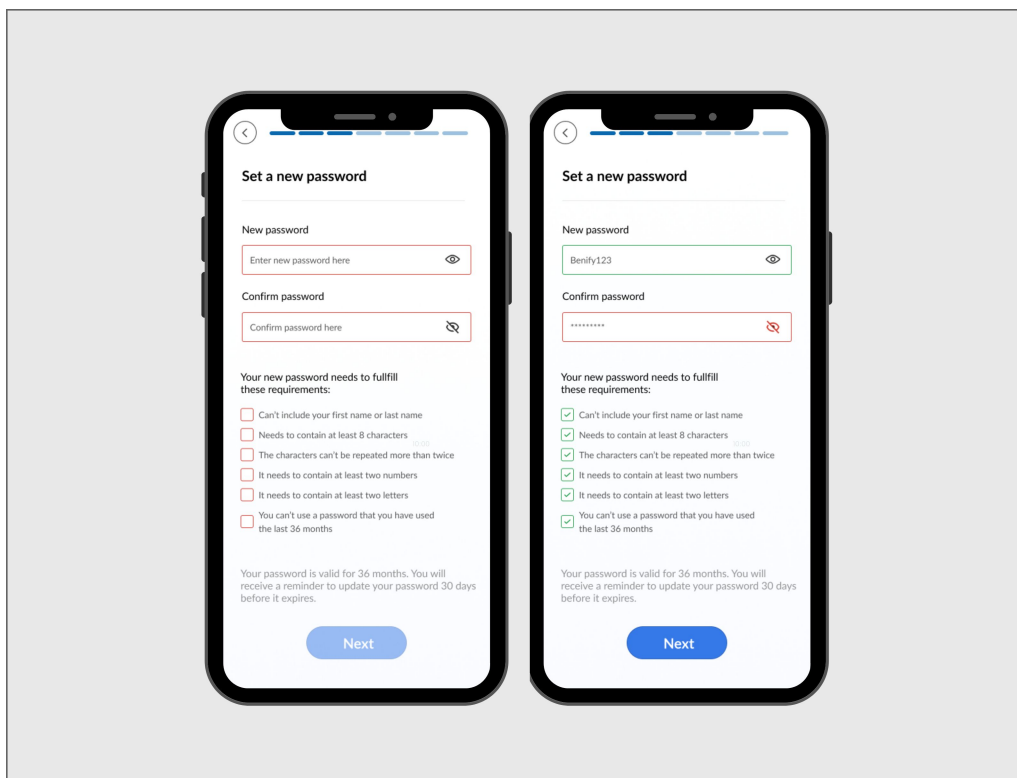


Figure 5.4: Registration: Password settings

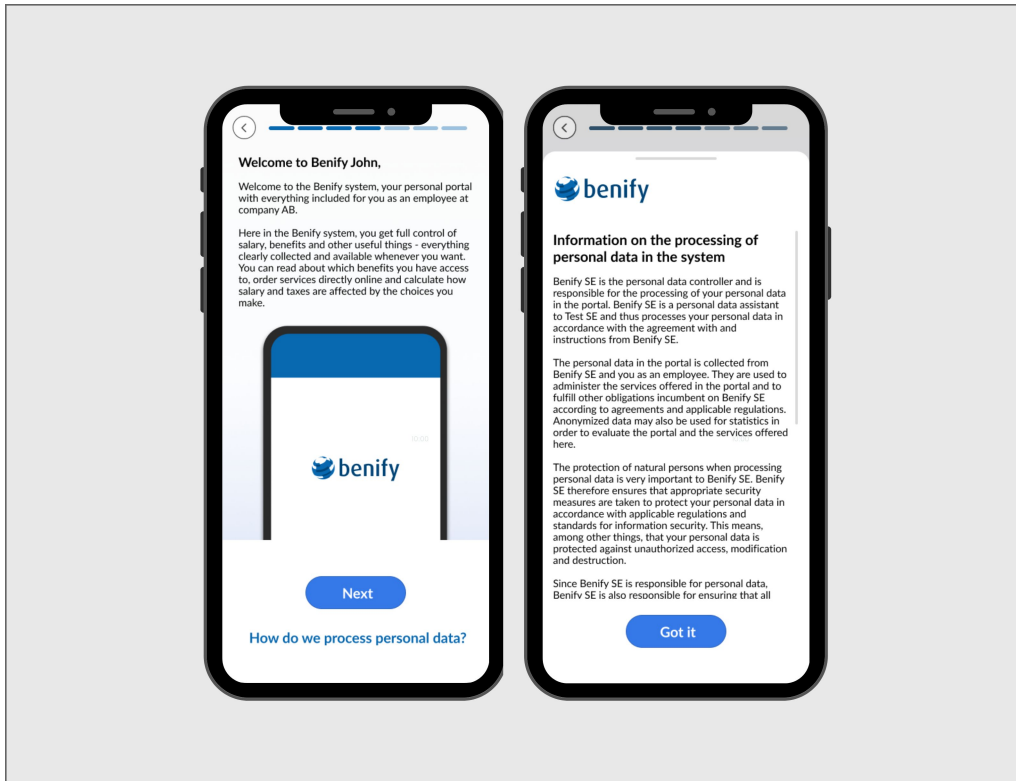


Figure 5.5: Registration: Benify’s platform and how Benify treats personal data

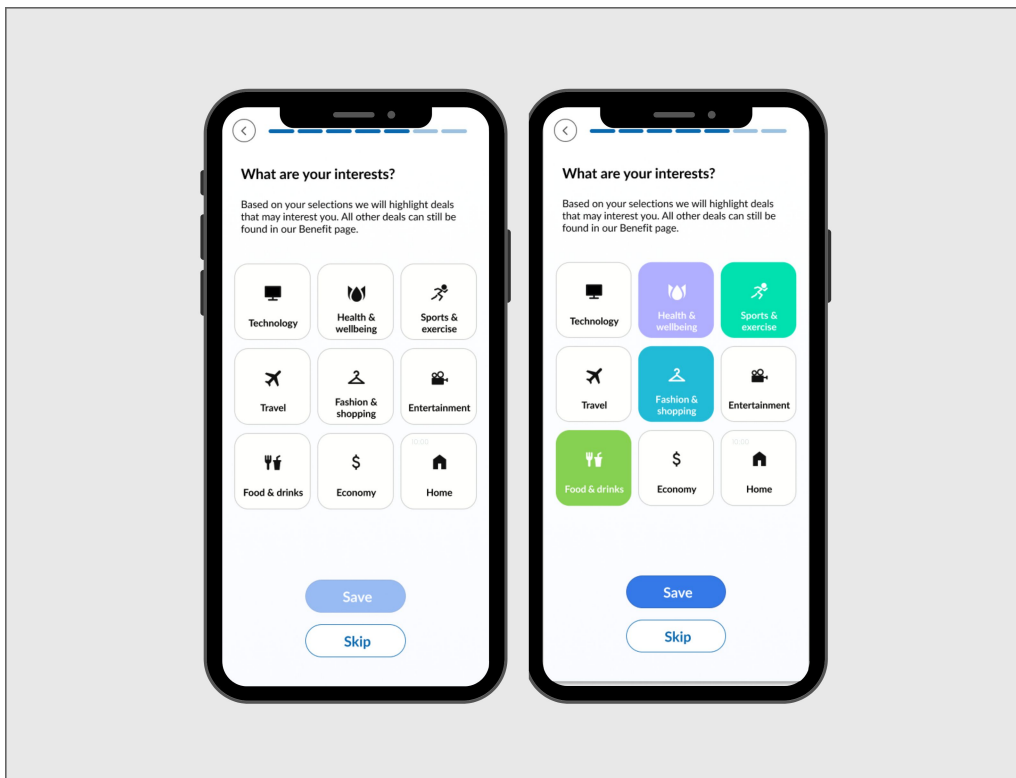


Figure 5.6: Registration: Personalization nudge (interests)

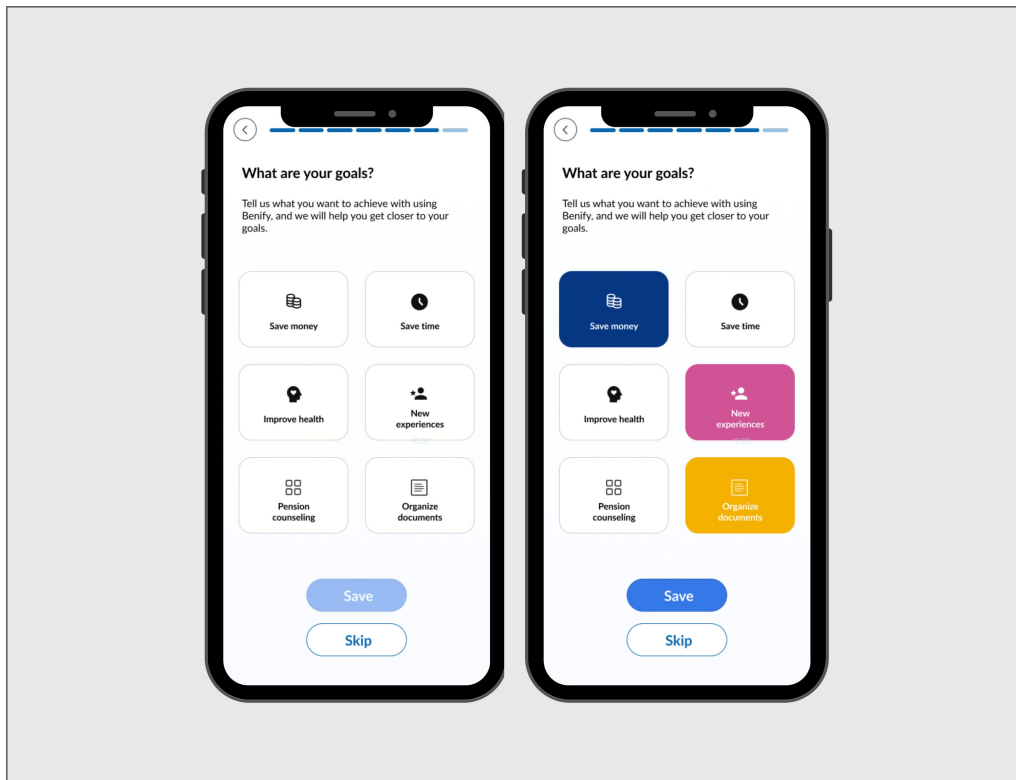


Figure 5.7: Registration: Personalization nudge (goals)

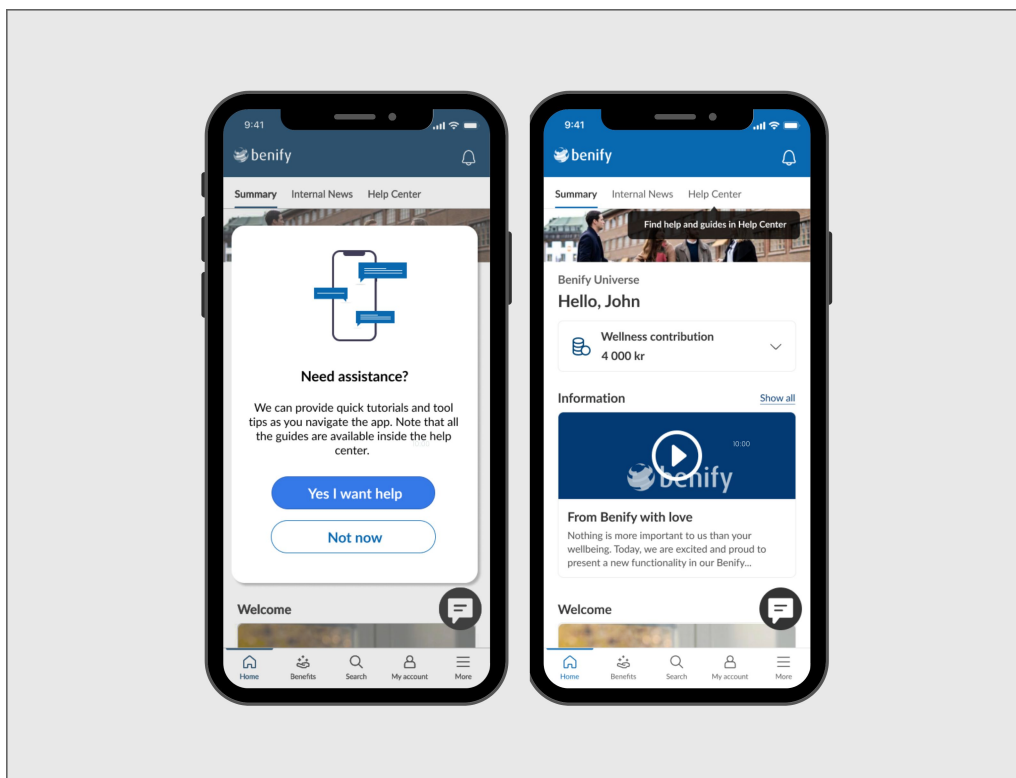


Figure 5.8: In-app: Guidance option and tool tips

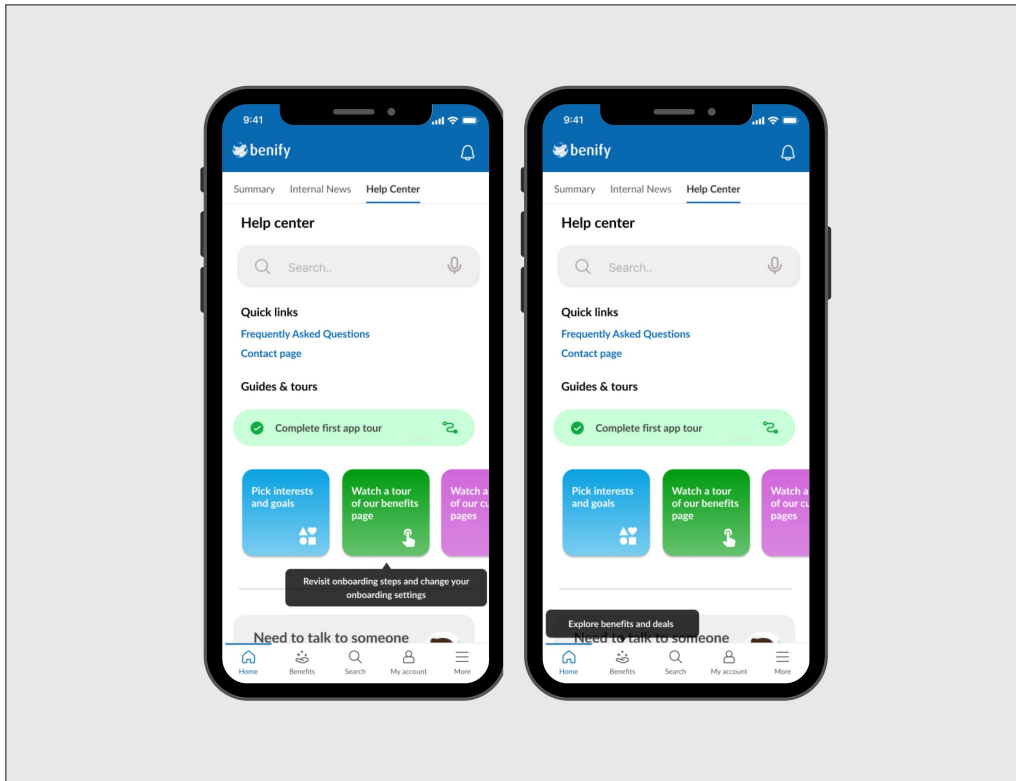


Figure 5.9: In-app: Help center

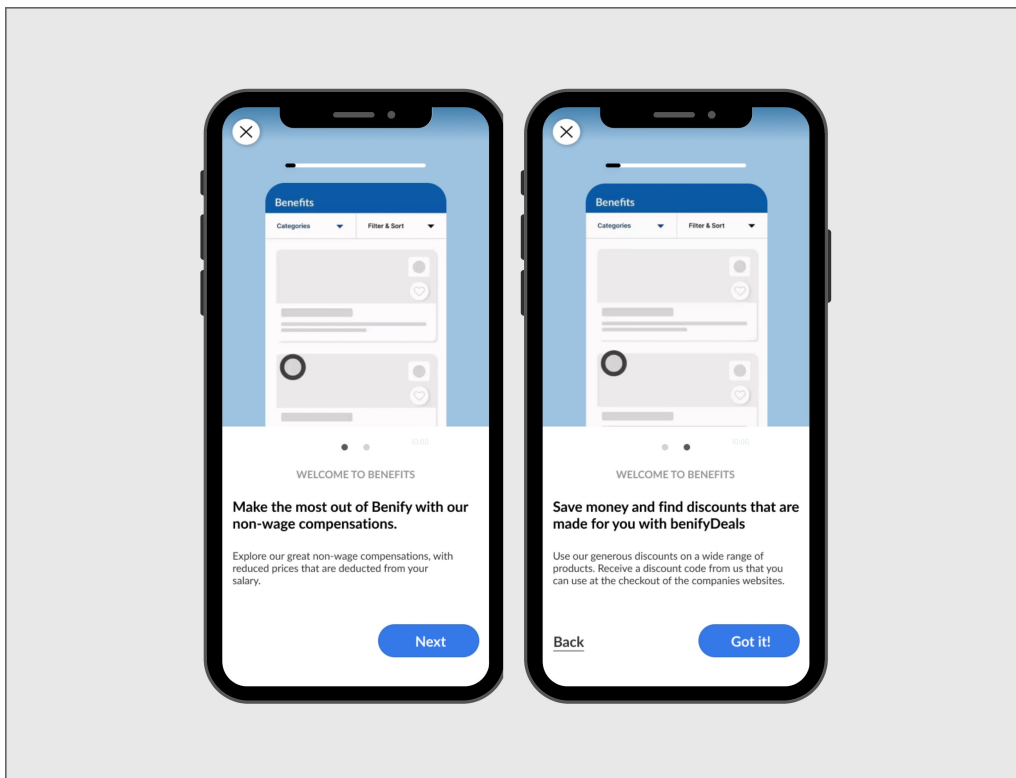


Figure 5.10: In-app: Animations inside Benefits page

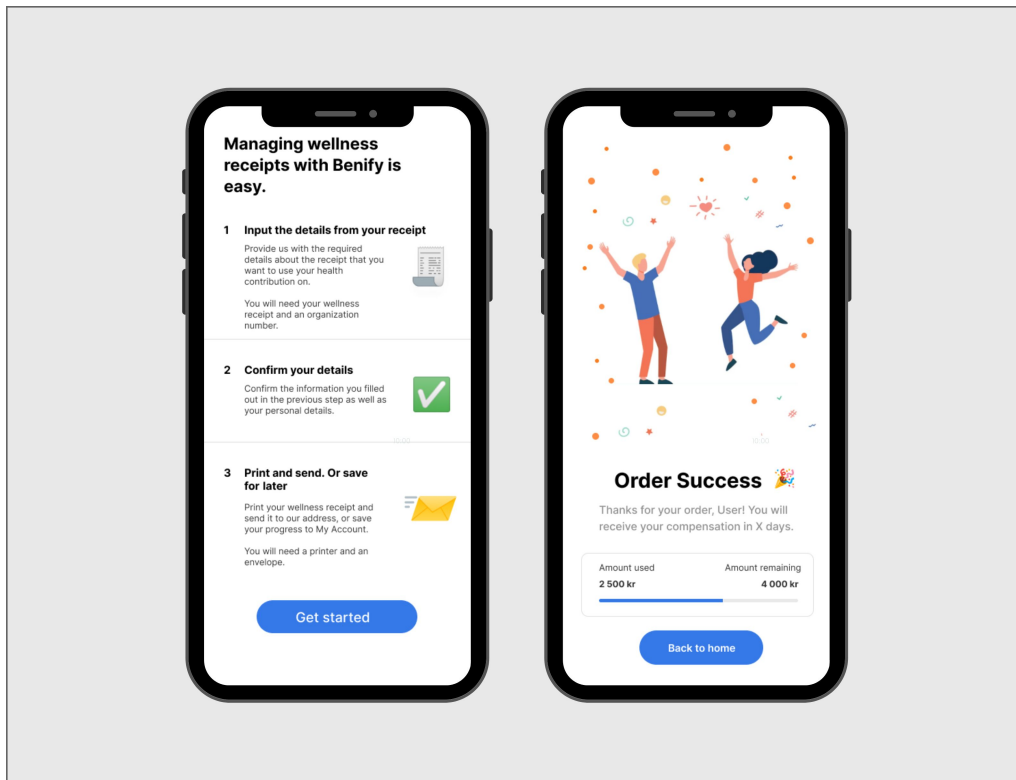


Figure 5.11: In-app: Overview of how to manage wellness receipts with order success message

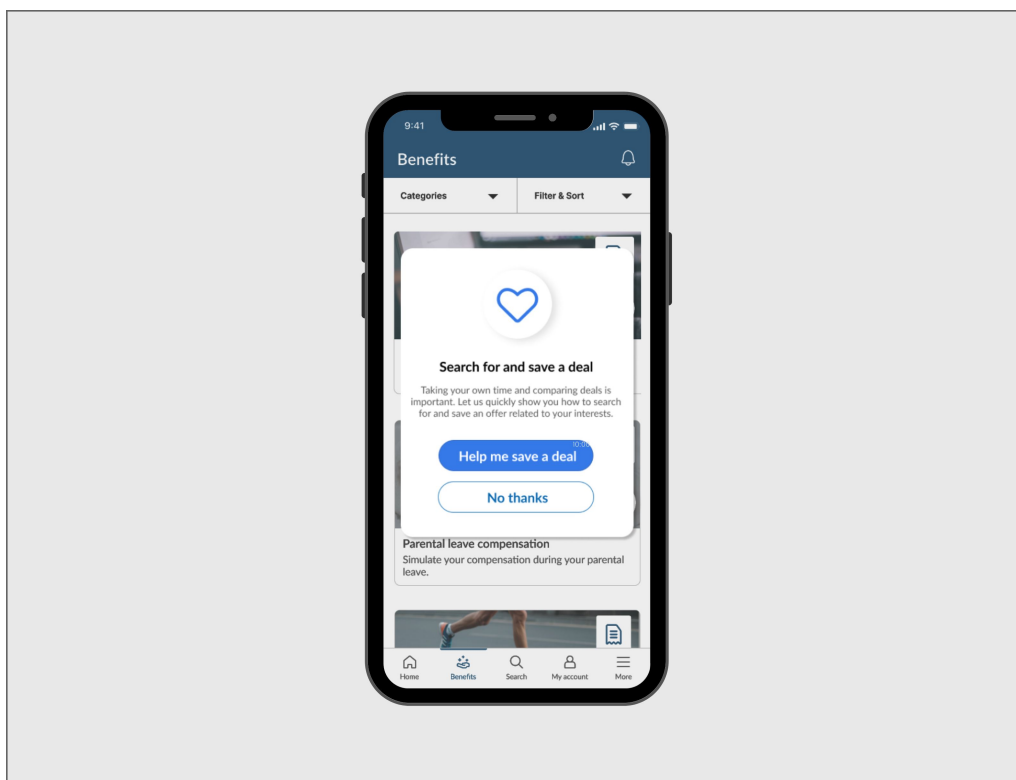


Figure 5.12: In-app: Commitment nudge

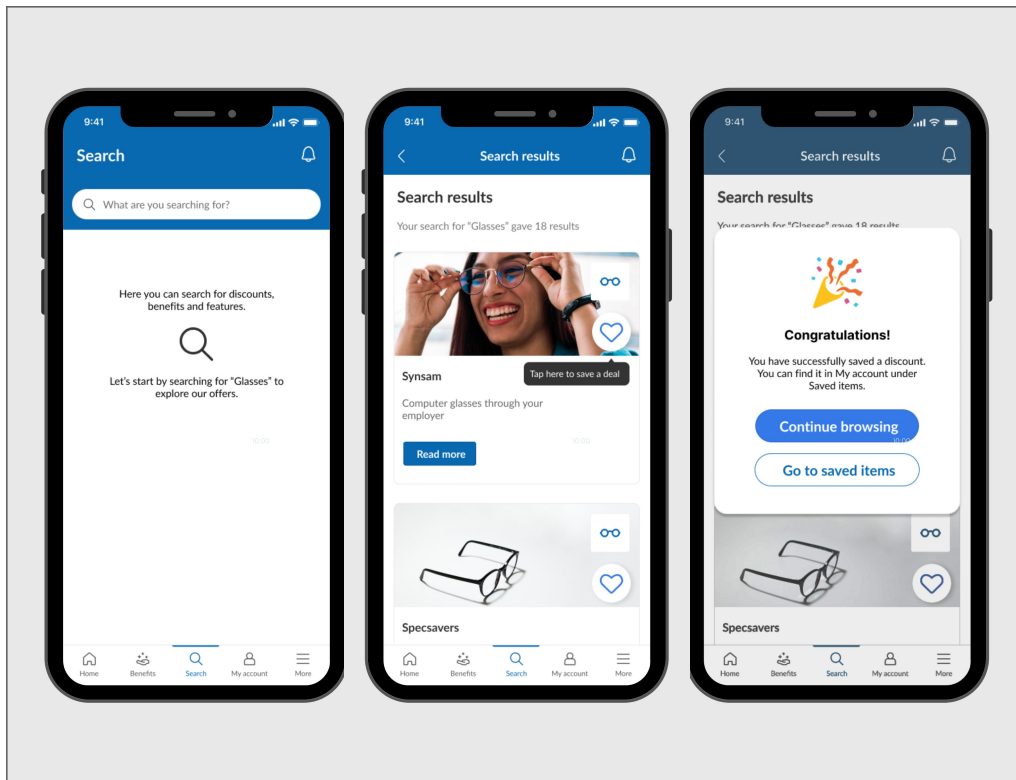


Figure 5.13: In-app: Commitment nudge - Search for and save a deal

5.2 A/B Testing

To investigate how the original onboarding and the new onboarding design affected the overall user experience of the Benify mobile app, an A/B test in Maze was conducted. The dependent variable for the test was which onboarding version the participants were exposed to, which led to two groups: a control group which were exposed to the original onboarding design, and an experiment group which were exposed to the new onboarding design. After being exposed to their respective onboarding variation, both groups were asked to perform a task inside the mobile app. The independent variables were the eight survey questions that the participants filled out at the end of the test.

5.2.1 Participants

A total of 95 people participated in the test. 24 data points were removed because the participants withdrew from the test. In the control group, 10 data points were removed and in the experiment group, 14 data points were removed. Therefore, a total of 71 data points were statistically analyzed in SPSS, with 36 test subjects in the control group and 35 test subjects in the experiment group (see Table 6.1).

Condition	Test subjects
Control group	36
Experiment group	35

Table 5.1: Number of participants in each condition

5.2.2 Survey questions

Table 6.2 provides an overview of the average scores of the two test groups for each survey question. G1 represents the experimental group, while G2 represents the control group. The survey questions followed the Likert scale with 5 options, where 1 equaled “Highly disagree” and 5 equaled “Highly agree”. In the last survey question, 1 equaled “Very bad” and 5 equaled “Very good”.

Table 5.2: Sample table with the average scores of the two conditions for each survey question

Questions	G1	G2
Q1: I feel that it was difficult to complete the task	2.5	2.1
Q2: I feel motivated to use my wellness contribution on the mobile app	3.5	3.1
Q3: I feel that it was difficult to understand the mobile app	2.2	2.2
Q4: I think that I would like to use this mobile app again	3.4	3.2
Q5: I feel like the mobile app is personalized for me	3.3	2.7
Q6: I think that being able to save deals is useful	4.3	4.0
Q7: I feel like I would need more assistance to understand the mobile app	2.8	2.8
Q8: How was your experience using the mobile app?	3.7	3.7

5.2.3 Sample characteristics

The answers to the survey questions were separately analyzed statistically in the software SPSS through independent t-tests with the significance level set at 0.05. Therefore, if the p-value was < 0.05 , the result was statistically significant, resulting in rejecting the null hypothesis. Conversely, if the p-value was > 0.05 , the result was not statistically significant, and the null hypothesis could not be rejected. The hypotheses for the questions (Q1, Q2, Q3, Q4, Q5, Q6, Q7 and Q8) were the following:

H0_{Q1}: There is no significant difference in the perceived level of difficulty to complete the task between the control group and the experiment group.

H1_{Q1}: There is a significant difference in the perceived level of difficulty to complete the task between the control group and the experiment group.

H0_{Q2}: There is no significant difference in the perceived level of motivation to use the wellness contribution on the mobile app between the control group and the experiment group.

H1_{Q2}: There is a significant difference in the perceived level of motivation to use the wellness contribution on the mobile app between the control group and the experiment group.

H0_{Q3}: There is no significant difference in the perceived level of difficulty to understand the mobile app between the control group and the experiment group.

H1_{Q3}: There is a significant difference in the perceived level of difficulty to understand the mobile app between the control group and the experiment group.

H0_{Q4}: There is no significant difference in the perceived level of likelihood to use the mobile app again between the control group and the experiment group.

H1_{Q4}: There is a significant difference in the perceived level of likelihood to use the mobile app again between the control group and the experiment group.

H0_{Q5}: There is no significant difference in the perceived level of personalization in the mobile app between the control group and the experiment group.

H1_{Q5}: There is a significant difference in the perceived level of personalization in the mobile app between the control group and the experiment group.

H0_{Q6}: There is no significant difference in the perceived usefulness of being able to save deals between the control group and the experiment group.

H1_{Q6}: There is a significant difference in the perceived usefulness of being able to save deals between the control group and the experiment group.

H0_{Q7}: There is no significant difference in the perceived need for further assistance to understand the mobile app between the control group and the experiment group.

H1_{Q7}: There is a significant difference in the perceived need for assistance to understand the mobile app between the control group and the experiment group.

H0_{Q8}: There is no significant difference in the experience using the mobile app between the control group and the experiment group.

H1_{Q8}: There is a significant difference in the experience using the mobile app between the control group and the experiment group.

The analysis revealed that the p-values for all questions (Q1, Q2, Q3, Q4, Q5, Q6, Q7 and Q8) were > 0.05 (see Table 6.3), resulting in none of the null hypotheses being rejected. However, Q5 (p-value = 0.067) was bordering towards significance, indicating that the onboarding that the experiment group experienced was slightly more personalized than the onboarding that the control group experienced.

Questions							
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
0.303	0.215	0.724	0.698	0.067	0.223	0.918	0.741

Table 5.3: p-values of each survey question

5.3 Heuristic Evaluation

The following observations and conclusions were made from mobile applying a heuristic evaluation to the design.

1. Visibility of system status
 - The progress bar inside the initial set-up of the onboarding phase visually informs the users where they are throughout the process and how much they have left in order to complete the process.

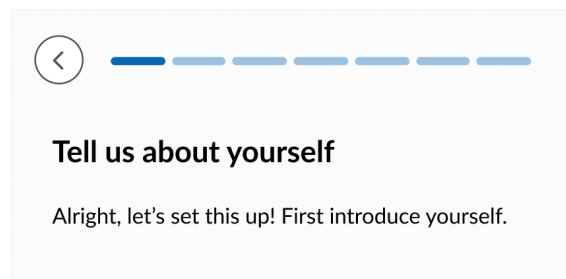


Figure 5.14: Progress bar

- A number of visual feedback cues have been implemented to the password screen in order to inform the user about the state of the interaction. The input box uses color codes to inform if the password fulfills all the requirements and if the confirmed password matches. The password requirements are listed on the screen and dynamically updated by being checked whenever the password has fulfilled the requirement (see Figure 5.15).

Figure 5.15: Password feedback

- Disabled ghost buttons have been implemented in certain screens to communicate that a required action needs to be taken by the user before they

can proceed. Whenever the user has taken the required action the button becomes clickable (see Figure 5.16).

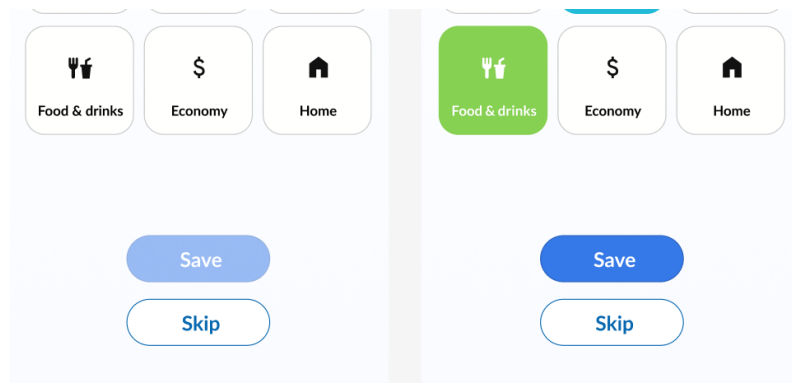


Figure 5.16: Ghost buttons

- The help center clearly shows if the user has or has not completed the mobile app tour. The single guides do not however indicate whether they have been completed or not, which can be a potential flaw in communication (see Figure 5.17).

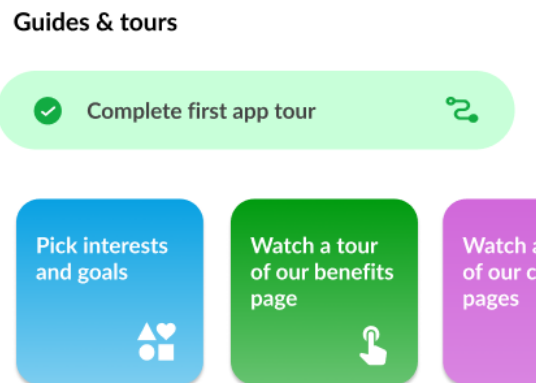


Figure 5.17: Help center feedback - The single guides does not indicate if they have been completed.

2. Match between the system and the real world
 - Simple and clear terminology has been used for the buttons, which clearly state the action that is taken when pressing the button (see Figure 5.18).

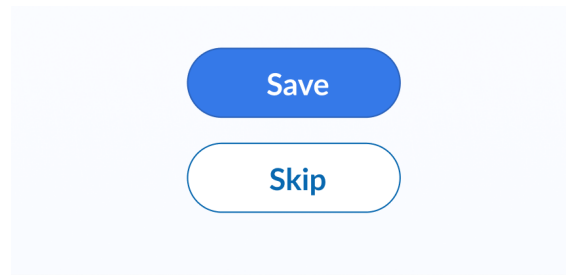


Figure 5.18: Buttons

- The selections inside the screens where the user selects their interests and goals could be unclear in regards to what they mean for a novel user who does not know what the mobile app provides. For instance, it might not be obvious what “entertainment” or “new experiences” refer to, and that might also make it harder for users to know what to choose when they are presented with the choice (see Figure 5.19).

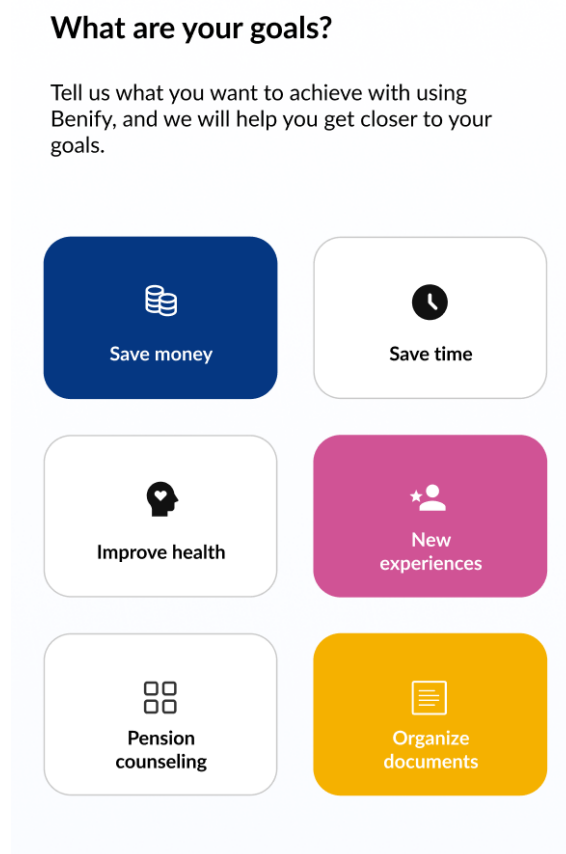


Figure 5.19: Goals selections

- Whether the screens are presented in the most natural and logical order is unclear. The first screens of the onboarding introduces the users to the platform. The first screens are the first impression, which is why the decision was made to put the value proposition there. It informs the user

about what they can achieve using the mobile app and emphasizes the “aha!”-moments. After the value propositions and the introduction, the user is asked to introduce themselves and to modify personal settings. The users are asked to provide information like name, email, and a password. After this process, but before the process of selecting interests and goals, the users are presented with a screen that informs the user in more detail about what the Benify platform is (see Figure 5.20). This placement may disrupt the logical order, as it is a screen which informs the company and the platform just like the first screens with the value propositions, but it is placed in the middle of a process where the user is still introducing themselves and giving input to the platform.

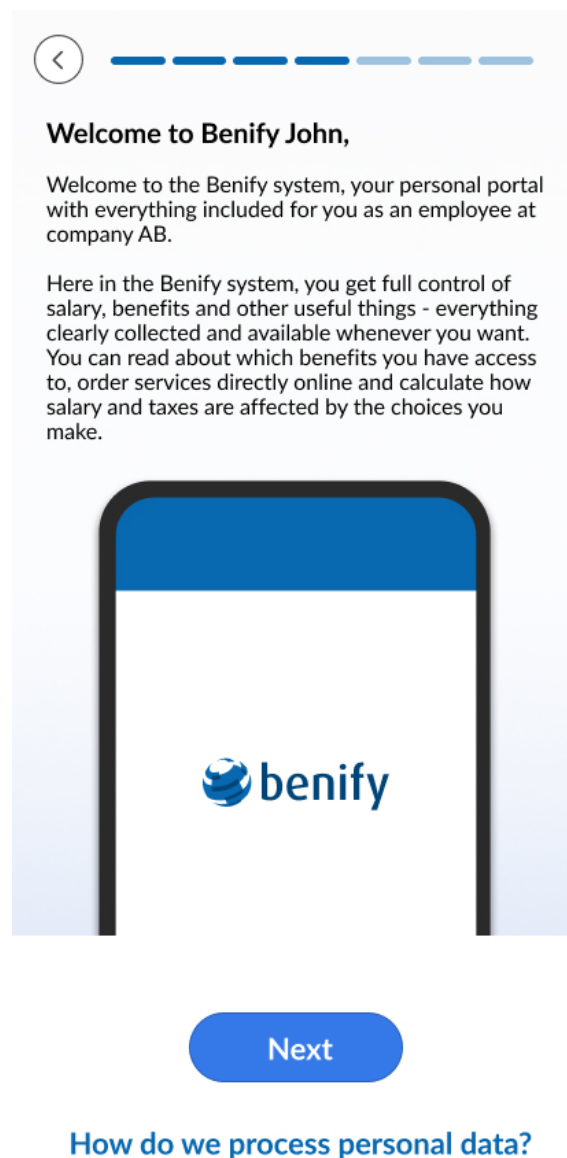


Figure 5.20: Buttons

- Integrated in-mobile app tutorials such as animations, modals, and tooltips are strategically placed inside the mobile app where they belong in order to make them logical, relevant, contextual, and task-focused (see Figure 5.21).

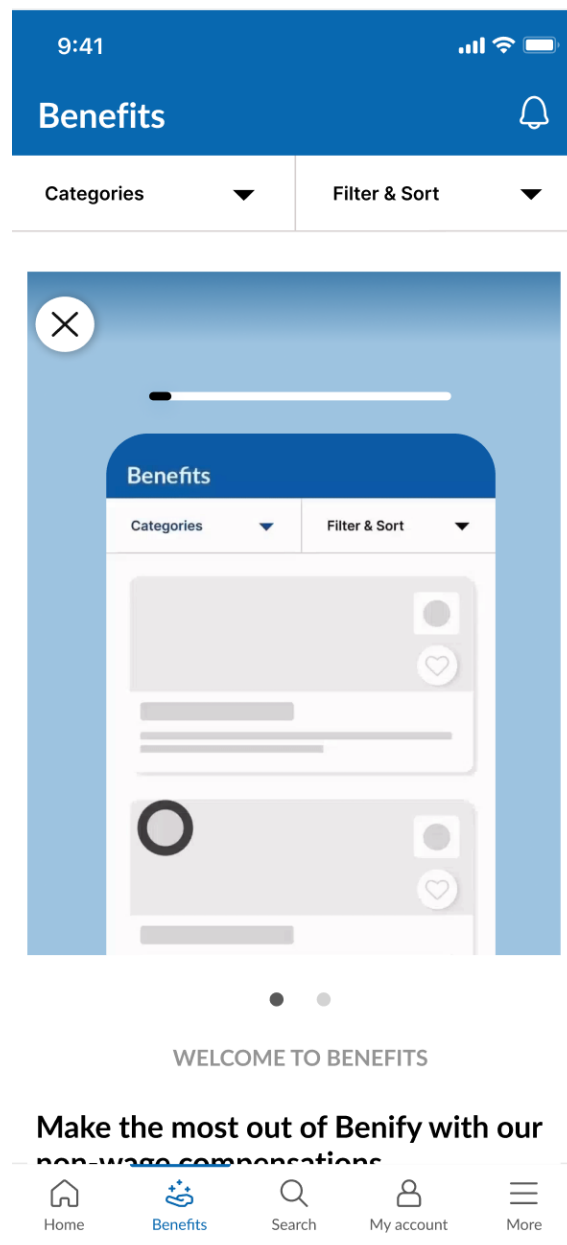


Figure 5.21: Mobile app integrated animation tutorials

3. User control and freedom

- As some onboarding frameworks, such as the MI framework, have highlighted the importance of freedom of exploration, the new onboarding design has made only essential information and required action visible and unskippable.
- Inside the initial set-up the progress bar offers a back button so the user

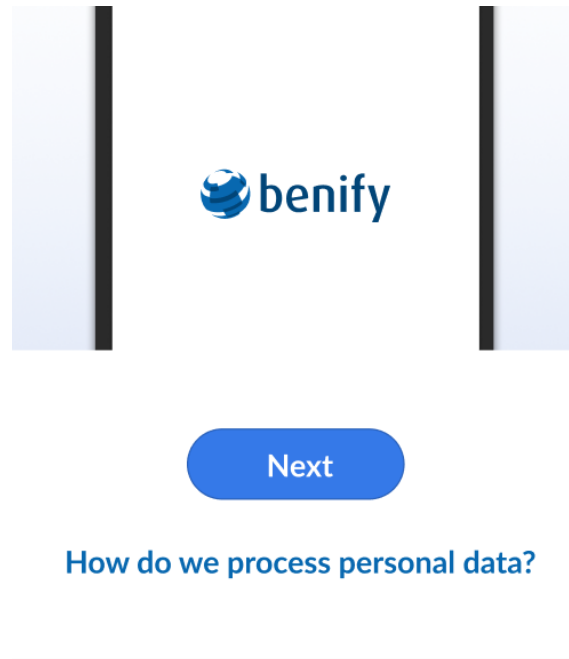


Figure 5.22: Previously visible information being hidden and accessed through pressing a button

- can go back and change settings if they would like (see Figure 5.14).
- When the users enter the platform for the first time after completing the initial setup, they are given the freedom of choosing whether they want guides and tutorials or not (see Figure 5.23).

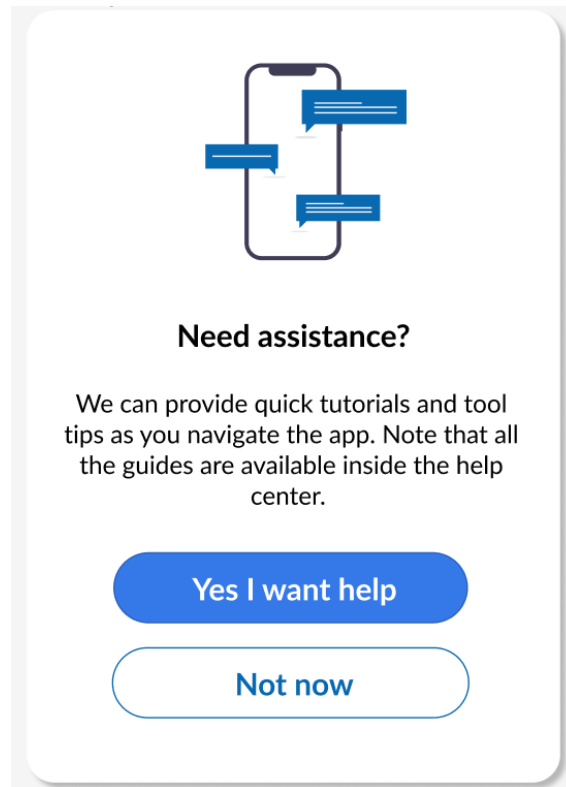


Figure 5.23: Modal asking the user if they want assistance

- The onboarding can be revisited inside the help desk where onboarding settings can be changed. If the user has declined to be presented with guides and tutorials they can seek help from inside the help center at any time (see Figure 5.17).
 - Erase buttons could have been added to the inputs in order to facilitate use and increase control.
4. Consistency and standards
- There is slight inconsistency where some screens use buttons with the word “Next” and some others with “Save” (see Figure 5.24). “Save” buttons have been used where users modify settings, such as choosing interests and goals, and choosing notification settings. “Next” buttons have primarily been used to navigate through screens, but also when the user is entering their personal information such as name, email, social security number and password. Entering personal information is also a form of modifying settings and could therefore benefit from having a “Save” button instead of a “Next” button to increase consistency.

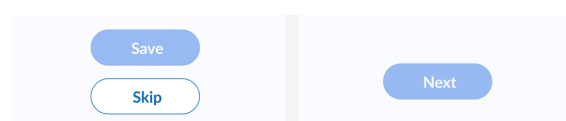


Figure 5.24: Save button and Next button

- The list of requirements for the password is accompanied by checkboxes that dynamically gets checked or unchecked whether the password has or has not currently fulfilled the requirement (see Figure 5.25). Using checkboxes can confuse the user as checkboxes are normally clickable and used for input. This could be reiterated in order to decrease the users confusion about pliancy and about the meaning of the checkboxes.

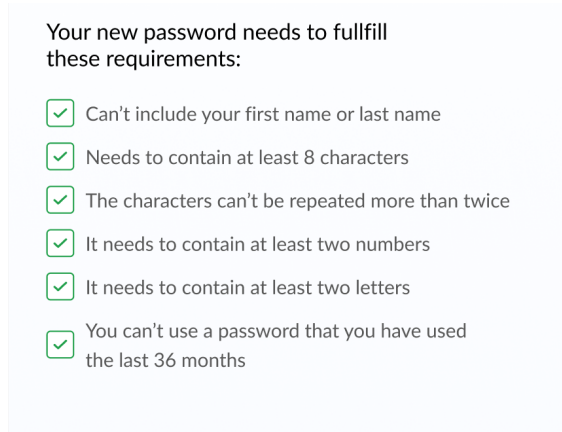


Figure 5.25: Dynamic password requirement feedback using checkboxes

5. Error prevention

- The design provides error feedback by notifying incorrect inputs inside the password screen. Red color indicates that the input is either incorrect by not fulfilling all the requirements, or if two password inputs do not match (see Figure 5.15). The “Next” button which is clicked to continue to the next screen is disabled until all the criteria has been fulfilled and the password inputs match.
- Constraints to the social security number input have not been implemented. However, the interaction of entering the social security number has been considered to be outside of the scope of this project.

6. Recognition rather than recall

- The help center has been developed to remove memory burden by letting the users revisit the onboarding, and see tutorials and guides (see Figure 5.17).

7. Flexibility and efficiency of use

- There have been no implementations done to satisfy this condition. A possible implementation would be to use the interests and goals input to customize the home page.

8. Aesthetic and minimalist design

- To avoid information overload, only information considered to be essential to each screen is visible. A lot of the information inside the old onboarding phase was shortened and some was hidden and can only be accessed by pressing a button (see Figure 5.22).
- To make the design consistent and aesthetics, the design components are following similar patterns across all screens, such as selection buttons, inputs, and modals.

9. Help users recognize, diagnose, and recover from errors
 - No error messages have been designed as they are considered to be outside of the scope of this project.
 - The password input has been designed to use error prevention to a certain degree, by stating the requirements and dynamically updating them whenever the user has fulfilled a requirement, along with color codes around the input field to signal if the password is accepted or declined by the system. The hide/view icon buttons inside the password input also helps the users to see what they have typed in order to prevent errors (see Figure 5.15).
10. Help and documentation
 - The help center has been developed for users to return to if they need assistance (see Figure 5.15).
 - The single guides inside the help center are not presented in a numbered or chronological order, which can cause confusion regarding which steps should be carried out in which order (see Figure 5.17).

In conclusion, completing a heuristic evaluation was a quick and effective way to analyze the results. Some areas required work, such as inconsistencies with screen buttons and indicating whenever a single guide has been completed. Some flaws were identified, such as using incorrect input methods which might cause confusion for the user (see principle 4 "Consistency and standards"). Moreover, some principles were not fulfilled as they were considered outside of the scope of this project. Principle 7 for instance, "Flexibility and efficiency of use" was not successfully fulfilled. For other design solutions the new design variation performed very well, for example by having a list of requirements that dynamically gets checked or unchecked whether the password has or has not currently fulfilled the requirements.

5.4 Guidelines

Although the A/B test did not yield statistically significant results, a wealth of information and knowledge about things to consider when designing an onboarding experience has been identified throughout this design process. A combination of knowledge obtained from the literature study, the qualitative research methods, and the product teardowns has been compiled into a list which constitutes of design strategies to consider when designing a successful onboarding experience.

Design strategies to consider when designing an onboarding experience:

- **Allow customization of onboarding:** It was noted that some individuals require freedom of exploration and learn by doing when interacting with a new application, while others appreciated and were in great favor of pedagogical guidance. Through dialog, it became clear that it is of utmost importance to respect individuals need to not be overwhelmed with educational content, as this can have a negative impact on their experience. Balancing the needs of individuals that want to explore on their own with the needs of individuals

that need guidance can be achieved through making the onboarding experience customized. We recommend asking new users if they need guidance, and to implement a Help Center which collects all guides so that they can be accessed at all times.

- **Include a personalization nudge:** Many interviewees expressed frustration over the current uncustomized experience on Benify's platform. Likewise, the participants during the iterative prototyping were in great favor of the personalization screens. From the statistical analysis, the survey question which investigated whether the experience was personalized (Q5) was bordering to significance. Furthermore, the literature supports goal-specificity and recommends that successful onboarding designs must prioritize the new users goals with signing up. Therefore, including personalization nudges which allows the users to personalize and customize their experience is a highly recommended design technique.
- **Guide users towards their "aha!"-moments:** An effective way of increasing goal-specificity is to identify and guide users towards their "aha!"-moments. Focusing onboarding around the "aha!"-moments is a great way of reducing information overload and increasing personalization. Making users goals with signing up central implies that all other information which is irrelevant to the users goals should be reduced as much as possible. This denotes the importance of keeping the onboarding experience to a minimum, where only relevant information is included and prioritized. For products with a long path to value, designers should try to showcase how the product can benefit the users in the future if they commit to the process. "Aha!"-moments share many similarities with *threshold concepts*, and thus also support the MI framework which in a similar manner states that bulks of knowledge must be reduced and only relevant transformative educational content should be prioritized. Therefore, we strongly suggest that an onboarding should be goal-specific by focusing the experience around the users "aha!"-moments.
- **Include a clear value proposition:** Previous research has shown that new users are quick to abandon new applications. However, a clear value proposition can increase user retention. Some interviewees expressed that Benify's current platform did not leave a strong impression, and that they did not clearly understand the benefits of the different features. The same participants were highly unengaged users and showed little to no interest in making an effort to understand such applications. During the product teardown method, it was noted that Benify's current onboarding lacks a clear value proposition, and that other applications with successful onboarding designs often stated the value of the applications multiple times. Therefore, we recommend that onboarding designs include a clear value proposition, and that it may be repeated multiple times throughout the the onboarding experience.
- **Onboarding as a long-term integrated holistic system:** According to the literature, an onboarding experience must be treated as a holistic expe-

rience which is well integrated with the rest of the system. A way of accomplishing this is to integrate onboarding strategies inside the platform - preferably over a longer period of time - rather than treating it as a sequence of steps that the user completes during their first interaction with a new platform. Integrated onboarding designs include tool tips, animations or other educational content that resides inside relevant screens, help centers, among more. During iterative prototyping, some participants mentioned that integrated educational content would benefit from being personalized, meaning that they could be based on algorithms which estimate the users usage and suggest relevant educational content to boost their experience. For instance, one participant suggested that the commitment nudge could appear after a few visits, in case the user had not already used the features that the commitment nudge suggested. Moreover, many participants agreed that a lot of onboarding design strategies that they evaluated were appreciated, but that they would not prefer to be introduced to everything at once. They expressed that the guidance would benefit from being spread out over time, where relevant educational content would appear at relevant times in order to respect their freedom of exploration and purpose of visiting. Therefore, we recommend that an onboarding must be well integrated with the rest of the platform and the user experience. Educational content should not be received in bulks, but be spread over time to reduce information overload and respect freedom of exploration. To increase goal-specificity, the educational content could be based on algorithms which can help suggest relevant content to the users.

6

Discussion

This chapter will discuss the results from the statistical evaluation as well as the methodology and design process of this research. Finally, suggestions for future work that can build upon this project will be presented.

6.1 Result Analysis

None of the A/B test questions were statistically significant, making it difficult to draw any conclusions. Therefore, the results suggests that the new onboarding does not increase users perceived motivation of engaging more with the product. Although there was no statistical significance to any survey questions, some of the questions yielded slightly better results on the new onboarding variation. This could be worth investigating further. A longer period of time for a similar test would have been advantageous. As onboarding is an ongoing process, a 10 minute test cannot determine the potential of the new onboarding experience. One would need to look at churn rates and user engagement over time. For instance, the new onboarding design included a help center where customers could revisit tutorials and other features. This function would necessitate a longer testing period. Furthermore, some elements, such as tool tips and commitment nudges, would arrive gradually. Moreover, as previously stated by Allan [3], it is critical to get as close to the experience of value as possible with products with a long path to value. Make it as realistic, specific, and tangible as possible for new users. An A/B test may not have been a suitable method due to Benify's long path to value because it is difficult for participants to experience Benify's value in a 10 minute test.

The participants were not notified that if they had previously used Benify's platform, they should not participate in the A/B test as they would understand the platform better. This might have influenced the outcome of the result. It is also not possible to rule out the possibility that some participants took part in both tests. It would have been preferable to do the test in a controlled environment, but due to time constraints this was not possible to achieve. Another option would have been to implement the redesign in Benify's platform and solicit feedback from actual users in their natural context of use. However, time and resource constraints did not enable such an implementation.

An issue occurred inside Maze for one of the experiment conditions during A/B Testing. There was a higher number of leaving participants in the test with the new

onboarding experience as some participants encountered errors that caused the test to stop working. It is unknown how many people withdrew for this specific reason; however, it is probable that this influenced the results and the experience for this specific test group.

It was decided to add a personalization nudge in the new onboarding design as it can boost the feeling of commitment to continue using a product and ultimately become long-term users. In the A/B test however, participants were given a situation in which they had to act as a fictional character. Since the participants had to fill in the fictional characters' goals and interests instead of their own, this might have affected their sense of personalization. Furthermore, personalization would imply a tailored experience within the platform, which was not prototyped or tested due to time constraints. A more personalized platform experience could have influenced the results. Many interviewees expressed a desire to be able to tailor their own platform; simply asking what their interests and goals are is insufficient. As survey question 5 ("I feel like the mobile app is personalized for me") resulted in a p-value which was close to being statistically significant ($p = 0.067$), it is reasonable to believe that the utilization of a personalization nudge is a promising onboarding technique. However, actually implementing a targeted experience based on personal input might be a necessity to gain the full experience of personalization.

Some parts of the redesign were not included in the A/B test, for example a screen showing how to manage one's wellness receipts. Even though it was not included in the A/B test, feedback on this design was received from participants during iterative prototyping. The decision to exclude these screens was based on the observation that they did not manage to fit into the natural flow of the user journey that the participants would follow in the A/B test. Moreover, including too many onboarding screens at once, which in a real context would appear gradually, was thought to potentially lead to informational overload. Thus, excluding it from the A/B test may have had an effect on the results because their answers to some questions may have differed if these screens were included.

After going through the the two different onboarding designs, all participants regardless of condition were asked to interact with the same mock-up of Benify' platform by executing a similar task, before answering the survey questions. It is probable that some of the answers were based on the impression of the mock-up of the platform, when in fact feedback on the different onboarding experiences were sought after. This could explain the similarities in responses between the control and experiment groups.

According to Galavan [32], an onboarding experience must be a holistic system that is integrated with the rest of the system. Platform and onboarding design should not be separate processes, but rather work in tandem to provide a complete experience. Although it was possible to make suggestions for Benify's current platform, the time limit did not make it possible to redesign larger portions of the platform.

In conclusion, the A/B test results were not statistically significant, which could be due to a variety of factors. Because onboarding is an ongoing process that can last several weeks or months, a lengthier test time would be required to examine certain aspects of the onboarding experience. Moreover, the flaws of the A/B test discussed in this subsection would benefit from being overlooked and improved before conducting a similar A/B test again.

6.2 Methodology Discussion

This thesis involved both quantitative and qualitative methods to gather and analyze data about Benify's users. The following section will present reflections about the methods used in the design process.

6.2.1 Inspiration

Several onboarding frameworks were used in this thesis, including "aha!"-moments, quick wins, digital nudges, and the MI framework. In retrospect, using fewer frameworks may have been advantageous, as incorporating more can make determining each framework's impact on this thesis more challenging.

Conducting user analytics on Benify's users with Qlik Sense revealed a wealth of information about their online behavior. However, a clear vision of what to focus on at the start of our research was not defined. As a result, a lot of time was spent on obtaining data points that were not used for the research. Focusing on generational differences was considered, but when it was time to recruit interview participants, getting individuals from all generations proved to be unfeasible, so the idea was abandoned. It would have been intriguing to investigate generational differences in a future project, but this would necessitate additional resources devoted to locating participants. During user analytics, time was also spent on investigating other factors such as occupation, country disparities, and device usage. Finally, device usage was chosen for further investigation as it proved to be the variable where most interesting data was discovered. The user analytics process took roughly four weeks, which could have been more effective and shorter if the focus user group had been formulated in advance. On the other hand, entering user analysis without a predetermined goal can be beneficial because it forces the researchers to look for more interesting data points rather than focusing on a specific subject, which may increase the risk of bias by only trying to confirm predetermined assumptions.

As Hulick [41] previously stated, interviewing users who have just crossed the finish line to become highly engaged users is preferable. However, only one of the seven interviewees was a highly engaged user, and their switching moment to a highly engaged user occurred a long time ago, so they were less likely to recall what prompted them to become an engaged user. The remaining interviewees were not highly engaged users, so the design centered around what was hypothesized to be their switching moment, based on their expressed dissatisfactions with the platform. Interviews with users who had recently become highly engaged users would

have been valuable in identifying specific switching points.

Although a lot of information was gathered from the seven interviews, further interviews could have helped in learning more about Benify's users. Two out of the seven interviewees were obtained through Benify, with the others being recruited through convenience sampling. The decision to stop seeking for interviewees and continue with other methods was made due to time constraints during the project.

Recruiting individuals for interviews from diverse generations in order to obtain viewpoints from people of varied ages was attempted. However, it did not prove to be feasible to recruit individuals from the 1980s and 1950s, which would have provided a more comprehensive knowledge of Benify's users since users from different generations might have dissimilar goals and needs.

6.2.2 Ideation

As earlier mentioned, Chapman and Milham [13] states that it is difficult to tell how many people a persona represents, making it difficult to determine whether a persona is relevant for intended users. Three user personas were based on similar attributes in the seven interviewees and the insights from the user analytics method. It is difficult to determine how relevant the created personas were and how many of Benify's users they actually represent. There is also a possibility that the personas that were created were biased, as they are created by the designer and insights which appeared the most relatable might have influenced the creation of the personas. However, using personas aided in reaching a consensus on who were being designed for.

6.2.3 Implementation

A total of 14 iterations were carried out on 5 participants, yielding numerous insights that were included in the final design. During several iterations, half of the participants' opinions were diametrically opposed to the other half, making it difficult to make a design decision. In retrospect, including more participants in the iterative prototyping process would have been advantageous.

Except for in the third session, when the participants were shown a flow of wireframes, the majority of the screens shown to the participants were separate screens rather than a sequence of screens. This resulted in isolated feedback and not a holistic view of the design. Participants' perceptions of the new design prototypes might have been impacted if they had encountered an extensive flow rather than isolated screens.

For the vast majority of participants, this was their first encounter with Benify's platform. This means they did not have a thorough understanding of the platform prior to participation and hence could not determine whether the new design prototypes were relevant and appropriate Benify's platform. In retrospect, it could have

been better to assign the participants a task and let them explore the platform before presenting them to the new designs prototypes.

During the feedback sessions, it became clear that many participants had widely disparate opinions about whether the onboarding should be brief and devoid of pedagogical guides, or whether it should be more extensive and include more guides. Age appeared to be a relevant factor, with older individuals preferring a longer onboarding and younger people preferring a shorter onboarding, which suggests that the onboarding experience could be further customized based on personal preference and needs.

6.2.4 Evaluation

Because the A/B test was conducted digitally and without a moderator, no environment validation was evaluated. Moreover, as the test was conducted in English, participants' fluency in English might have had an impact on their performance and survey answers. Participants were instructed to take the test on a computer or laptop; nevertheless, screen size and loading time may have varied for individuals, which may have affected their results.

The low degree of user interaction on Benify's platform was one of the primary problems raised. As previously stated by the Interaction Design Foundation [29], one of the fundamental principles of HCD is identifying and understanding the root problems. That being said, an onboarding redesign may not be one of the fundamental causes of Benify's platform's low degree of user interaction. Although better onboarding may slightly enhance engagement, a higher increase in user engagement may demand a platform redesign. A more rigorous attempt of trying to identify the root issues to the problem of low user engagement would therefore have been beneficial.

During heuristic evaluation, it was noted that the new design successfully fulfilled a lot of the usability principles but that some principles could have been improved. Conducting a heuristic evaluation as the final method during a design process was not an optimal decision, as it would have been better to use the results as a guide for further iterations before implementing it in an A/B test.

In conclusion, the research's findings from user research and a literature review gave useful information for designing a better onboarding experience. However, because the findings were not statistically significant, no inferences regarding whether the new onboarding design was preferred or not over the old onboarding can be reached. Two possible explanations are that (1) additional qualitative user research is required to discover user switching moments that are crucial to examine and include in the design, or (2) longer testing periods are required as onboarding is an ongoing process that can last several weeks or months.

6.2.5 Future Work

Only likert scale questions were included in the A/B test. Incorporating open-ended questions would yield more thorough responses from the participants. This would, however, take substantially longer, which is why it was decided against. However for future work, it would be good to examine the participants responses in greater depth by adding qualitative methods.

As mentioned earlier, Hulick [41] states that one must conduct qualitative study with users who have recently experienced their switching moment, which is the point at which they transitioned from new or inactive users to active users. During the interviews none of the participants had recently experienced their switching moments. For future work, recruiting participants who recently experienced their switching moment could aid designers in aiming towards guiding new users towards the same switching moment.

As mentioned previously, the Interaction Design Foundation [29] states that one of the fundamental principles of HCD is understand root problems. A redesigned onboarding experience might not be the root problem. For a future work it would be beneficial to explore possible root problems for Benifys low user interaction.

In this thesis, several onboarding frameworks were applied, including "aha!"-moments, quick wins, digital nudges, and the MI framework. Choosing one framework to focus on in the future would be good in order to investigate its' individual impact on the onboarding process.

As earlier mentioned by Ruairí Galavan [32], onboarding is an ongoing process without a defined ending. A brief A/B test may not have been the greatest way to test certain components of the design, such as commitment nudges, personalization, tool tips, and other features that are expected to appear gradually or be available over longer time periods. In a future project, it may be preferable to test the new onboarding on real users over a period of several weeks or months.

7

Conclusion

This study's research question was:

"What design strategies should be considered when developing an onboarding experience, in order to raise users perceived motivation of interacting more with a product?"

To investigate this, an extensive literature review on human-computer interaction, behavior theories related to motivation, onboarding design strategies, and frameworks was done. In addition, a literature study on design research and methodology, specifically the HCD, GDD, and PD frameworks, was undertaken in order to develop a design process for this thesis. To understand how Benify users navigate and interact with the platform, an analysis of quantitative data already collected by Benify was conducted. Based on the insights made while reviewing the quantitative data, semi-structured interviews with real end-users were developed to provide in-depth responses to the reasoning behind the users' behavior on the platform. Afterwards, a product teardown on Benify's current onboarding experience was conducted to fully grasp the current experience that the product provides. Furthermore, a state of the art analysis was performed by conducting product teardowns on five different applications with well designed onboarding experiences. Common onboarding strategies and insights were identified and collected. Data from interviews was analyzed using an Affinity Diagram, leading to five main insights. These insights were transformed into design opportunities through How Might We Statements. User personas, journey maps, and flowcharts were created based on the insights. Iterative prototyping produced nine design concepts, tested with participant feedback. A final design was wireframed and tested through an A/B test and heuristic evaluation to assess usability. Lastly, guidelines on what design strategies should be considered when designing an onboarding experienced was formulated based on the collected knowledge and insights gathered throughout the design process.

The data indicate that the new onboarding did not increase users' perceived motivation to engage more with the product because none of the A/B test questions were statistically significant. Because onboarding is an ongoing experience, a quick A/B test to measure customers' perceived motivation to engage further with the product may have been poor choice. A test that lasted several weeks could have shown different results because some of the onboarding concepts, such as commitment nudges, guidelines, and tool tips, should be experienced by users over time.

7. Conclusion

Some of the strategies utilized in this study included collecting qualitative data from consumers. Participants were asked to share their opinions and emotions through interviews and iterative prototyping. However, during the A/B testing, participants were only asked to answer Likert scale questions, with no option to provide more detailed responses. This was due to time constraints, as assessing their responses would take too long. Collecting and analyzing participants' in-depth answers from A/B testing may have supplied us with more information about their onboarding experience.

In conclusion, an onboarding experience is a highly complex design project which must be based on extensive user research. Aiding a vast number of diverse users towards reaching their personal goals and realizing their "aha!"-moments can be challenging, but theory and research nevertheless support the notion that it is the most crucial experience that a user has to go through during their entire user journey. This research provides some suggestions of future work which can be used in order to investigate further how an onboarding experience can be designed in order to potentially increase user motivation.

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A

Appendix 1

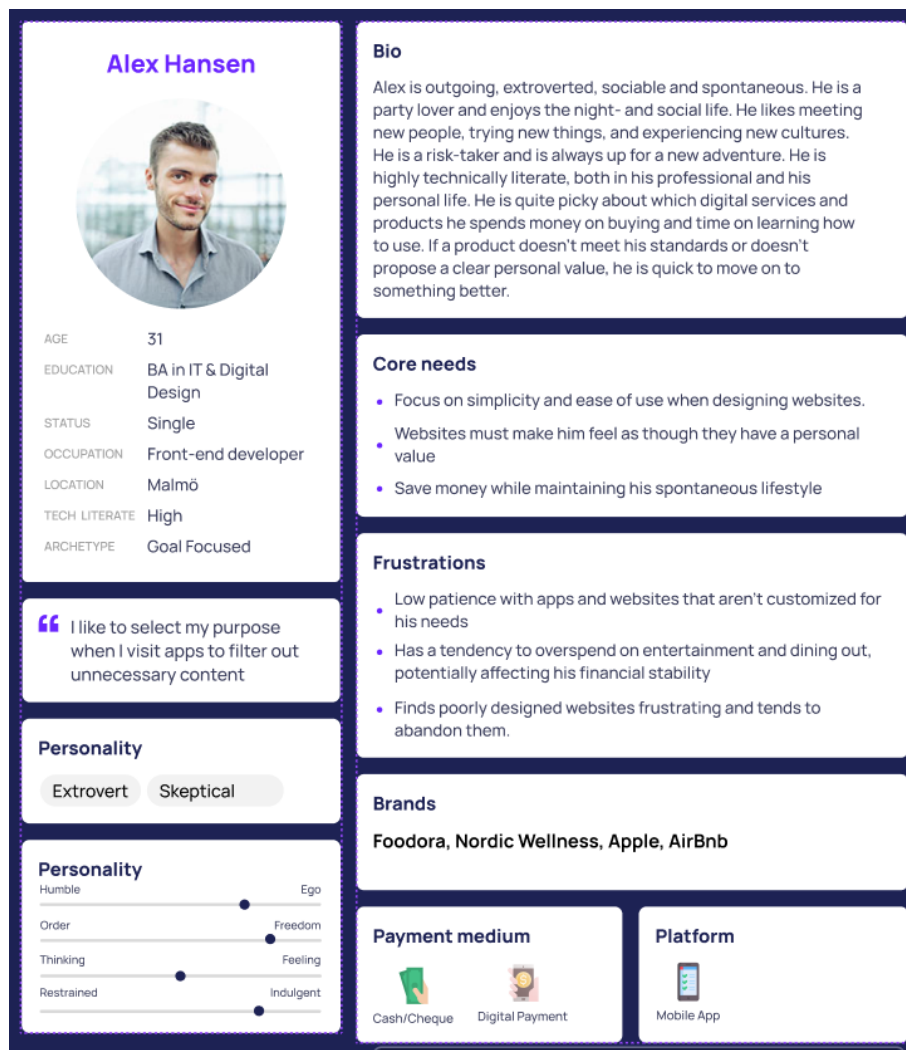


Figure A.1: User Persona - Alex



Figure A.2: User Journey - Alex

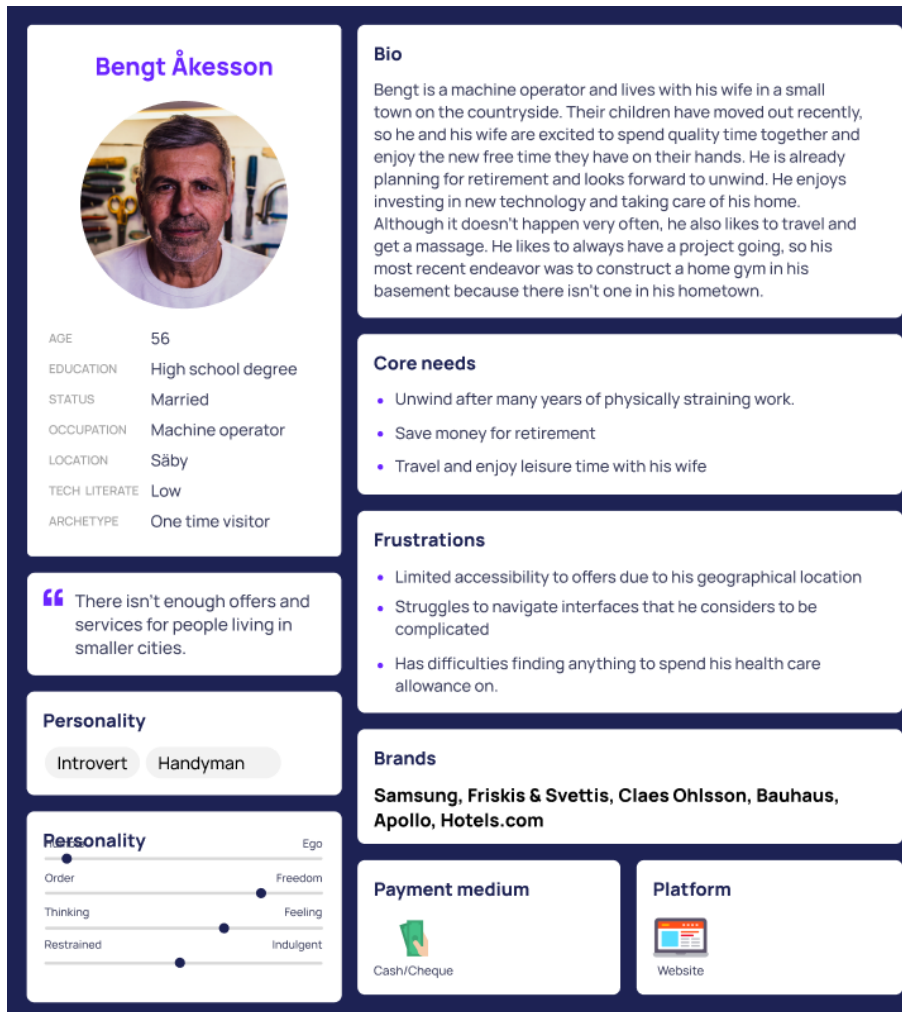


Figure A.3: User Persona - Bengt



Figure A.4: User Journey - Bengt

Alex Hansen

Buying a gym membership

Scenario: Alex, a young single guy, wants to buy a gym membership with his wellness contribution on through Benify's app after getting login details from his employer.

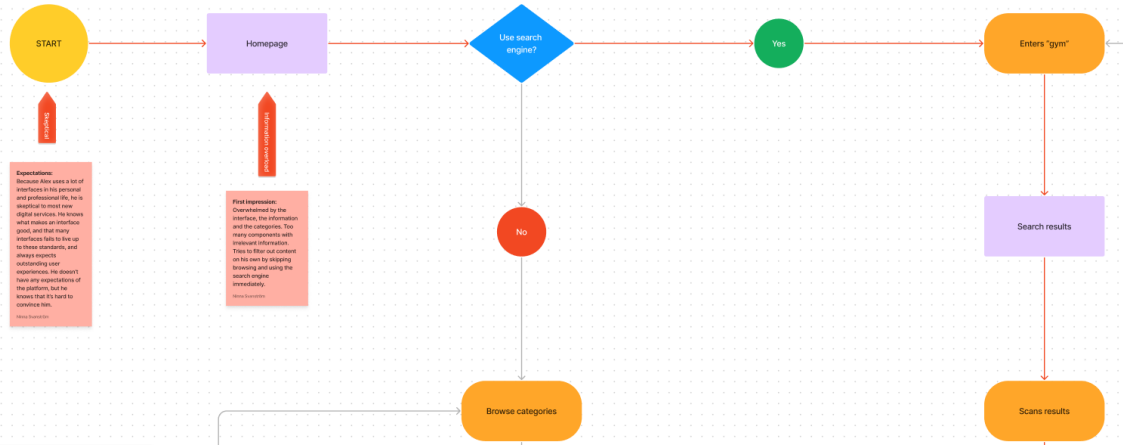


Figure A.5: A part of a task flow - Alex

Bengt Åkesson

Before onboarding

Finding a gym offer

Scenario: Bengt, a middle aged married father, wants to find a gym offer to use his wellness contribution on through Benify's app after getting login details from his employer.

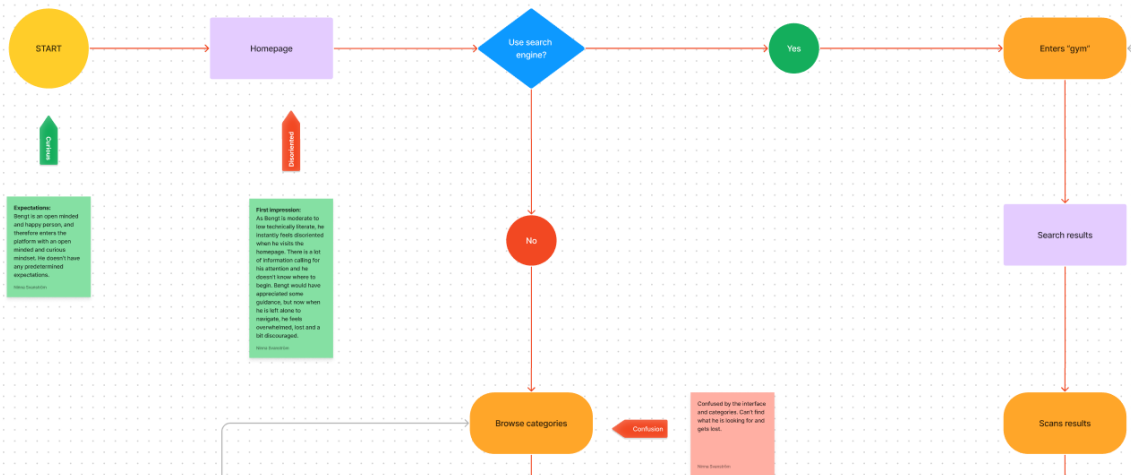


Figure A.6: A part of a task flow - Bengt

Research participant agreement

Benify is carrying out research to better understand how people use our products and services. Your participation in this study will help us improve the user experience of our products. In the study, Benify will record one or more session(s) of your use of a prototype product to gain insight for product improvement purposes. The personal data processing activity is carried out on the basis of your given consent to the processing of your personal data.

If you decide to take part in our research, Benify will collect information about you which may include personal data, such as:

- Your email address,
- Demographic information such as age, gender, education, employer, and professional role,
- Metadata automatically gathered by Maze, including operating system, browser version, browser type and language of the device,
- Video, screen, and audio recordings gathered when interacting with the prototype.

Benify uses the research platform Maze (Maze.co – MAZE.DESIGN LIMITED) to conduct this research. Maze acts as a processor of the personal data collected on behalf of Benify to host the service and store your personal data. The processing of your personal data also involves a transfer of your personal data outside of the European Economic Area (EEA) to the United States. As Maze is based in the U.S., it is subject to potential surveillance by U.S. intelligence agencies. Benify has entered the EEA controller to processor Standard Contractual Clauses with Maze.

Furthermore, whenever personal data is transferred outside of the EEA, Maze ensures a similar degree of protection is afforded to it by implementing measures which comply with applicable privacy law, including, but not limited to, the EU:s Data Protection Regulation 2016/679 ("GDPR").

All user data is transported securely, encrypted in transit, and encrypted at rest. More information about Maze's privacy commitments may be found at <https://maze.co/security/> and <https://maze.co/privacy-policy/>.

Your personal data listed above will also be processed and analyzed by employees at Benify, with the purpose to understand user needs and improve the current experience and interface of our products. Benify employees involved in the design of the products may watch the recording of your session in the future. These recordings will be treated as confidential and will not be shared with any third parties other than Maze. Benify will not store your personal data or recordings longer than necessary for the purposes stated in this agreement. Maze may retain the data for up to 32 days after the removal of the Benify account.

Benify may publish research reports that include your comments and actions, but any such information will be completely anonymous. This means your name, identity or any other information that can be connected to you will not be shown in the research reports.

Your participation in this study is completely voluntary and you may withdraw your consent to the processing of your personal data at any time, without providing a reason thereto. Any withdrawal of consent will not impact your ability to continuously use any Benify services. If you have any questions or concerns about this study or if you wish to withdraw your consent, please email user.research@benify.com.

Figure A.7: Research participant agreement for A/B test

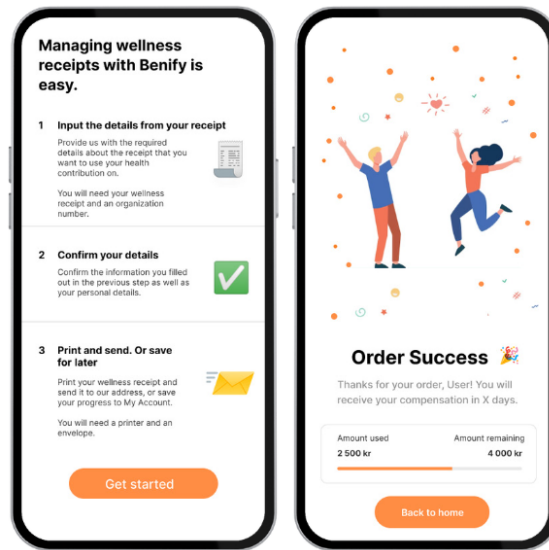


Figure A.8: Final design excluded from A/B test - Wellness receipts



Introduction

Context Screen

You will be presented with a scenario and directed to interact with an app. Following that, you will do a brief task linked to the scenario. Finally, you will respond to eight survey questions about your experience.

Figure A.9: A/B Test - Introduction screen



Welcome!

- 1 You will soon start to complete a series of missions and questions. There's no right or wrong answer; just do what comes naturally!
- 2 What follows is a succession of interactive screens, these are designs and the final product may differ.
- 3 When asked to complete an action, you only have to click or tap. If something doesn't respond, don't worry - this just means it's not clickable.

[Get started](#)

Figure A.10: A/B Test - Welcome screen

Registration

Imagine that your name is John and you just started working for Company AB. Your employer has provided you with login details to Benify and asks you to log in to their platform.

Benify is an HR platform where employees for instance can spend their wellness contribution, get access to exclusive benefits and deals and review their payslips, and more.

You open the mobile application of the platform for the first time and are now about to go through the registration.



Get started

Figure A.11: A/B Test - Registration screen

A. Appendix 1

Welcome to this meeting. We are two master students in Interaction Design from Chalmers University, doing our master thesis in collaboration with Benify. Our task is to do user research to suggest improvements to Benify's platform, which is why we reached out to you, and we are very thankful that you agreed to talk to us today. We estimate this interview to take about 20 minutes, but it depends how much you have to say to us of course. If we surpass 20 minutes, then feel free to interrupt the interview or continue to talk if you have time!

During this interview we will be asking you a few questions about how and why you use Benify, and what you like and what you dislike about the platform. The interview will be recorded so that we can transcribe it later, but as soon as the transcript is done, we will delete these recordings. No one but us two students will have access to the recordings and the transcriptions. Once we have extracted insights from the transcriptions, all the data will be anonymized and no information that we have gained will be connected to any of the research participants. We won't share any of this information from these interviews with any third parties, it will only be used for our master thesis for Chalmers, and for Benify to improve their service to you users. You are allowed to withdraw from this interview at any point if you would like to, just let us know and we will end this call and not use any of your information for our research.

Do you have any questions, or does everything feel clear?

So we would like to ask you:

Do you give your consent to participate in this interview?

Figure A.12: Interview manuscript - part one

Interview questions

1. When & how often do you visit Benify's platform (hour, day, week, month)?
 - Do you log in and out or do you stay logged in on an advice and just open the platform?
2. Can you tell us about what you normally do on the platform when you login?
 - Do you normally just log in to browse/have a clear goal (e.g. place order, view your ~~pay slip~~ ~~pay slip~~? Why/why not?
 - How often do you look at discounts/~~benifyDeals~~ ~~benifyDeals~~, benefits or custom pages? Why?
 - What do you feel about the range of deals on the platform? Is there something you like or something you feel like is missing?
 - Is it important for you to keep up with the latest deals and benefits?
3. What device do you use to log in to Benify platform? Why? Do you usually use the same device or do you vary?
 - What device (app/computer) do you prefer for what purpose?
 - Do you feel this is something for the desktop, mobile, or both?
4. Can you recall and tell us about your first experience with the app when you were a new user? (was it easy/hard to understand/learn how to use it?)
 - Did you feel that you had sufficient knowledge to understand how to use the platform or did you rather have to figure out on your own how to use it?
 - Do you wish that you would have gotten more help with how to use the platform when you were a new user?
 - Did you have any expectations on Benify when you were a new user?
 - Do you have new expectations today?
 - Has Benify been able to live up to your expectations, or failed to live up to your expectations? How and why?

Figure A.13: Interview manuscript - part two

5. Can you tell about the last time you encountered a problem on the platform?
- Do you remember any problem you encountered / What other problems have you encountered?
 - When you run into problems/can't find what you're looking for, how do you go about to solve that problem? Who/what do you consult for help?
 - In general, do you think that the interface is easy or hard to understand? Why/Why not?
 - Do you think it's easy/hard to find what you are looking for? Why/Why not?
 - Tell me about a task that was easy to accomplish.
 - Tell me about a task that was challenging task to accomplish
6. What do you like the most about Benify/the platform?
- What do you like the least about the platform?
 - Is there any way [project website or application] isn't supporting your needs currently?
 - What are your suggestions of improvements (offers, interface, etc.)?
 - What would you need on the platform to make you more interested in visiting the platform more often?
7. Does Benify have a personal value Benify for you (in your personal life)? If so, how or why not?
8. Do you feel that Benify is created for you? Why or why not?
- Do you feel that the Benify platform is adapted for your age group/target group? Why/why not?
9. Can you tell about the last time you made an order?
- How often do you place orders? When throughout the year do you make purchases?
 - What makes you place an order/what makes you not place orders?
 - How often do you place order through the platform vs. Outside of the platform? Why/Why not?
 - When you do spend money through Benify (on the platform our outside), what do you normally spend it on?
 - Do you normally take your time to think before making purchases or are you often quick and more spontaneous when shopping?

Figure A.14: Interview manuscript - part three

10. Can you tell me about the last time you used the search engine?
- How often do you use the search engine?
 - For what purpose would/do you use the engine? What do you search for?
11. What more would be valuable for us to know?
- End:
- That was all our questions for you. How did it go? Do you have any questions that you would like to ask us?
- Thank you so much for taking your time to talk to us, we appreciate it a lot. We hope that this will help us help Benify to improve their user experience. Please feel free to contact us at any point if you would have any more questions, you have our email (the one we used to contact you).
- I hope you have a good rest of the day, good bye!

Figure A.15: Interview manuscript - part four

AirBnB

- It has a simple sign-up process to facilitate the process of becoming a registered user.
- The guides are anchored in the task domain by being embedded inside the mobile app where they are relevant to the task at hand. For instance, many screens contain short descriptions of their purpose and how they can be used, in order to educate the user while they are "on-the-go" of exploring the mobile app. The mobile app also provides educational pop-ups with several guides about the purpose and features of a page, whenever the user goes to that specific page.
- Some complex processes, such as posting a new ad as a host, use educational explanations inside each step of the process, making the tutorial integrated in the mobile app and action-oriented.
- Most of the onboarding strategies are overall non-invasive and support freedom of exploration, by passively explaining how the user can use the platform on each screen. Thus, the onboarding is well integrated into all different parts of the interface which is a wise design strategy considering that the mobile app has a long path to value, which can make the use of commitment nudges and goal-specificity difficult.
- It supports reading to do, study and locate by including a "Questions?" button in many screens where the user is going through a process, such as posting an ad as a host.

Figure A.16: Key findings from product teardown of AirBnb's onboarding

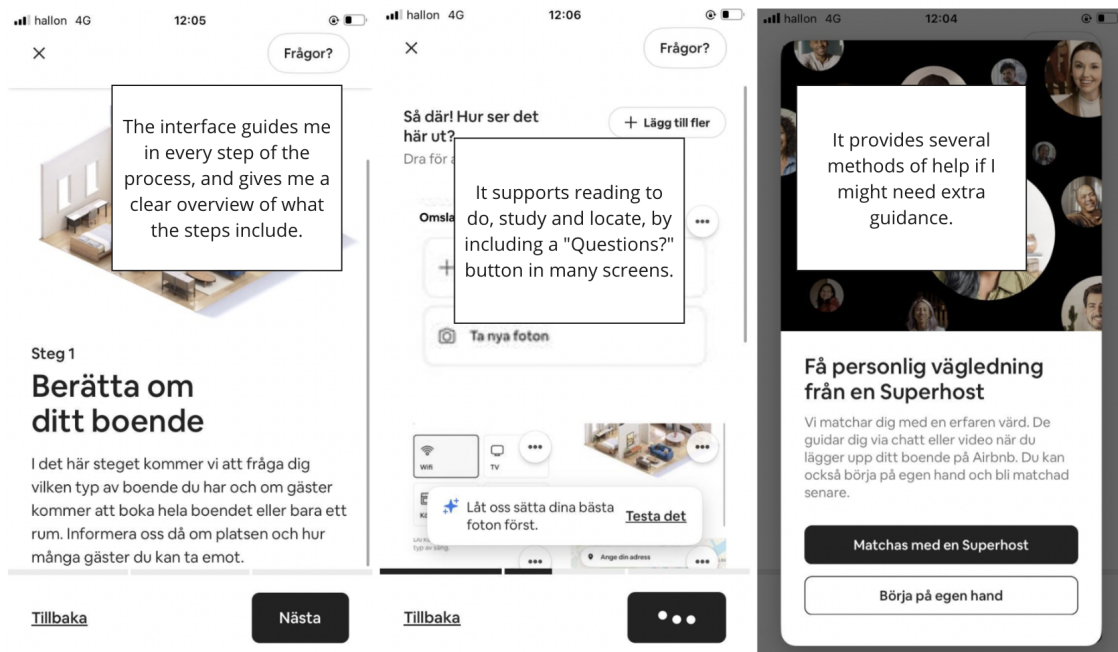


Figure A.17: A snapshot from the product teardown of Airbnb's onboarding

Mailchimp

- It welcomes the user by having a clear value proposition at the beginning of the onboarding, helping the user to instantly experience an “aha!”-moment.
- It has a simple sign-up process to facilitate the process of becoming a registered user.
- The onboarding is mostly embedded in the mobile app and highly action-oriented, thereby supporting freedom of exploration. Each screen that the user visits is explanatory through the use of illustrations and short descriptions. The descriptions explain the functionality and purpose of the screen.
- Simple guides and tutorials are included inside the mobile app which explains certain functions, news, and tips, that the user is free to pay attention to or ignore.
- It supports reading to do, study and locate by including a "Learn More" button on certain screens which takes the user to the help center

Figure A.18: Key findings from product teardown of Mailchimps onboarding

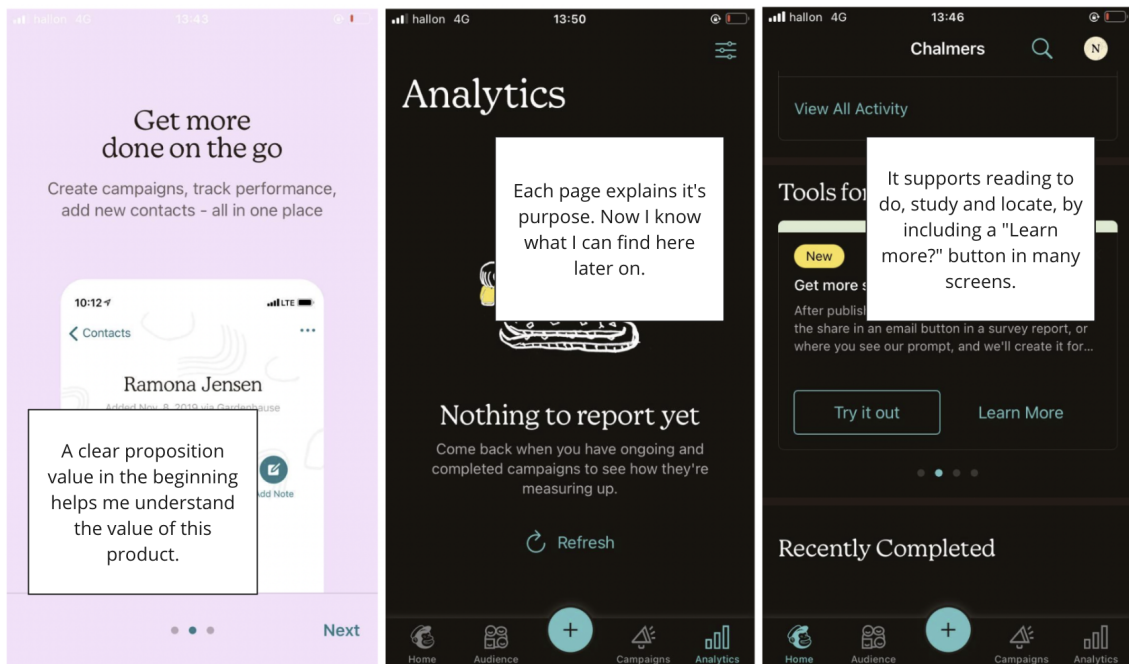


Figure A.19: A snapshot from the product teardown of Mailchimp’s onboarding

Fastic

- It has a simple sign-up process to facilitate the process of becoming a registered user.
- It includes several screens with value propositions throughout the onboarding, helping the user to experience “aha!”-moments.
- It has implemented a personalization nudge by asking the user about their experience with fasting, their goals of becoming a user, and what challenges they are currently facing with achieving their goals. Moreover, the mobile app creates a personal plan for the user based on their input and data.
- It is highly goal-specific by having a customized home page based on the personal information provided by the user.
- It uses various UI elements such as progress bar, gamification, and tokens to give feedback of progression and achievement.
- It supports freedom of exploration by providing optional tutorials inside the mobile app inside relevant screens, making the onboarding action-oriented and task specific.

Figure A.20: Key findings from product teardown of Fastics onboarding

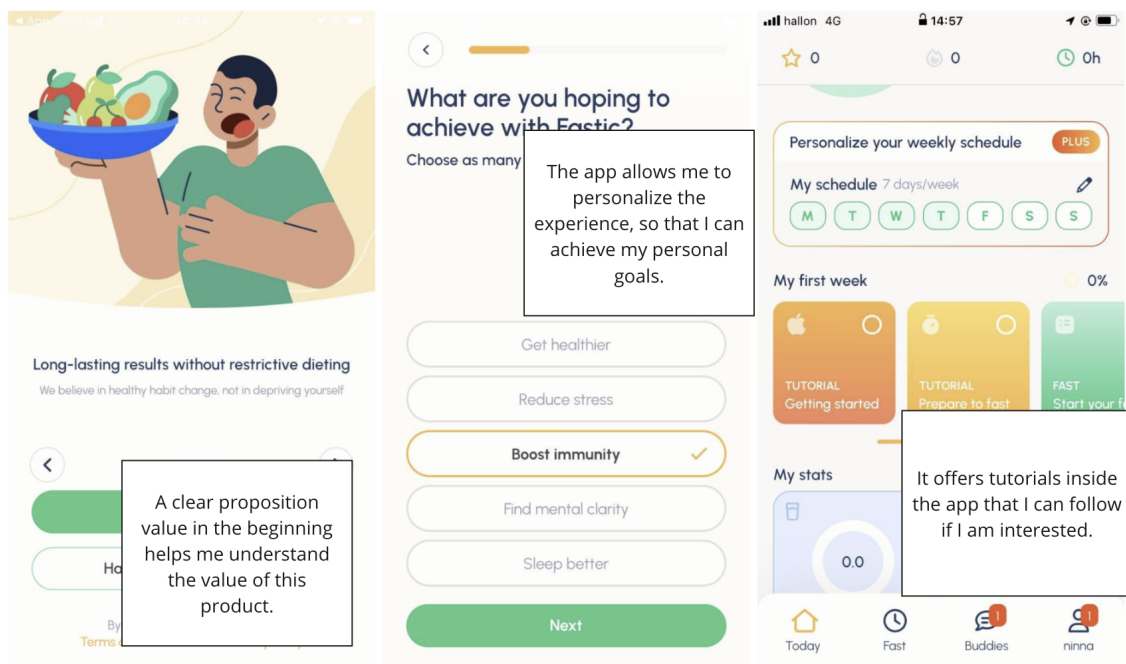


Figure A.21: A snapshot from the product teardown of Fastic's onboarding

Strava

- It has a simple sign-up process to facilitate the process of becoming a registered user.
- It has implemented a personalization nudge by asking the user what they want to achieve by becoming a registered user.
- It has implemented several commitment nudges by asking users to commit to small tasks inside the mobile app, which the user is free to decline. Thus, the onboarding is action-oriented as the user learns to navigate the platform by performing these tasks. Performing these small tasks can lead to quick wins, as they make the user achieve a small benefit.
- It supports freedom of exploration by providing optional tutorials inside the mobile app inside relevant screens, making the onboarding action-oriented and task specific.
- The platform uses tool tips to highlight new features.
- It does not have a clear value proposition and does not clearly guide the user

Figure A.22: Key findings from product teardown of Stravas onboarding

A. Appendix 1

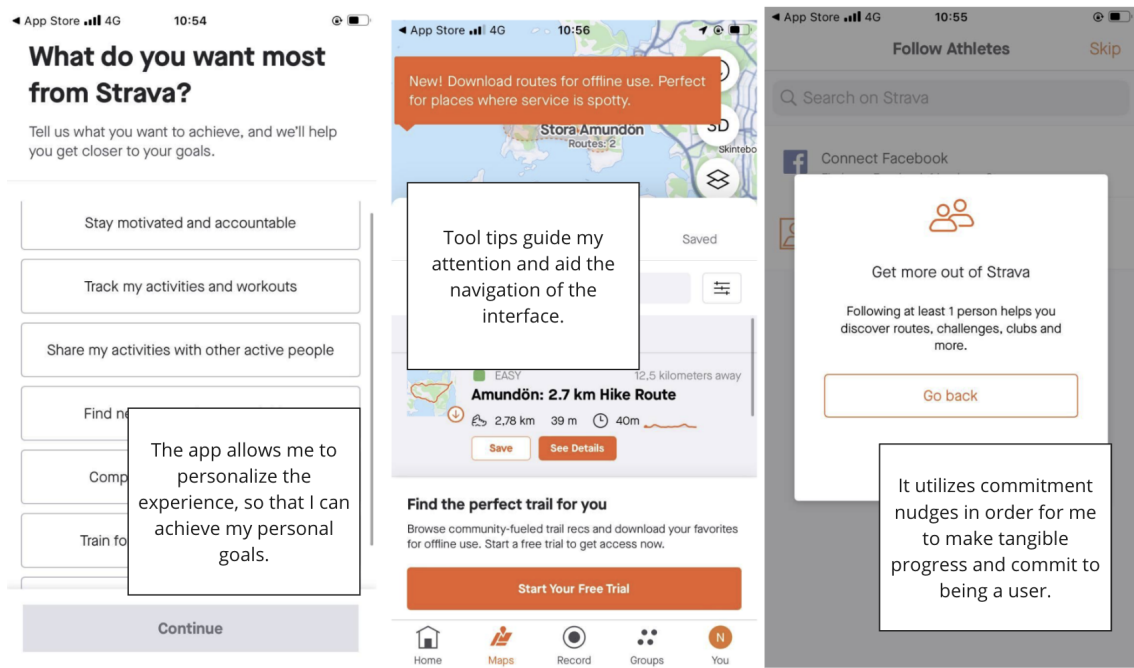


Figure A.23: A snapshot from the product teardown of Strava's onboarding