
# Designing a student health care portal page

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## Abstract

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Patient-centered healthcare stands as a pivotal benchmark in assessing healthcare quality, prioritizing individual needs and preferences. The evolving landscape emphasizes an increasing demand for healthcare systems to adopt a patient-centric approach. Collaboratively involving patients in their care becomes imperative for medical professionals, as patients contribute invaluable insights to cultivate a more patient-centered healthcare environment. User experience design (UX) also known as design thinking plays an important role in the helping creating usable, successful services, and products. Design thinking can be used in the medical field to help cultivate a more patient centric health care.

This product-based thesis explores design thinking principles into healthcare design. The project focuses on with a focus on improving student health portals for the student health care of Finland (YHTS) patient portal. The primary goal of this project is to showcase design thinking about how it can be used in the medical field. Aligned with patient-centric thinking, design thinking positions the user at the center of service delivery, promoting accessible and user-centered design.

The theoretical section of this thesis aims to describe what are currently problems with health care today. As well considering patient-centered care and its overarching objectives. Subsequently, an exploration of design thinking within the medical field is undertaken. This involves an examination of how design thinking can play a pivotal role in comprehending patients and addressing the student's needs.

The project follows the framework of design thinking. By using this process, it helps keep the user at the center of the product and helps show fully deliverable product. In the chapter on research and understanding the reader will learn more about the research conducted in this thesis and how it applies to the student health care system. The next chapter will show the process of creating a prototype and how the data gathered in the discovery phase was used to design it. Finally, a chapter on testing will show how user test were conducted to help refine and reshape the prototype.

The recommendations promote a unified portal design, improved symptom information accessibility, and transparent communication about wait times. This thesis highlights design thinking's transformative potential in reshaping student healthcare in Finland, emphasizing patient-centric care and enhancing user satisfaction.

**Key words**
Healthcare, Usability, Patient centered healthcare, Accessible design, Design thinking, Patient portal, Healthcare

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# 1 Introduction

Imaging you are a student with an urgent condition and desperately are seeking an appointment with student health care of Finland. You're met with an unintuitive scheduling system that seems to add to your stress rather than lower it. Or you're a student with a less sever condition and you have been waiting months to hear about an appointment and cannot locate any relevant information when an appointment will be offered. This struggle highlights the human side of healthcare and underscores the importance of improving user experience for all student patients in Finland.

This frustration not only has effects for the patience, but also has implications for the student healthcare system on a whole. For example, missed appointments, delays, and miscommunications can lead to a confused patient care and increased cost for the system. The challenges in the healthcare system, originating from scheduling to information understanding, can be effectively addressed through user experience and design thinking. By actively assisting and guiding patients through healthcare services, these methodologies contribute to the establishment of patient-centered care. This not only enhances the overall user experience but also provides healthcare providers with valuable insights to tailor services more precisely to individual patient needs.

The author of this thesis is working in the field as a user experience designer. This field can also be described as product design, which is the practice of creating more visual designs for companies. Service design is the practice of understanding the user needs and alleviating their pain points. This is not limited only to digital solutions but extending to various other areas where a type of service is given.

The author of this thesis will be focusing on the methods used in the field of user experience design for this project thesis. He is a student of Haaga-Helia University of applied sciences and has studied in the field of User experience design at the school. The content of this thesis is to follow the principles of design thinking and apply it to the student health care system.

## 1.1 Background to the topic

The background of this thesis is the existing student health care system in Finland. The service is called YTHS and is under the ministry of Social Affairs and Health. This falls under the banner of the Social Insurance Institution of Finland (KELA). Within the current system, students can seek information about medical problems by searching within its website and landing page. Also, within the system students to make appointments and seek out other services to assist them. There are other services and resources offered withing the portal such as videos and online applications for the students to take advantage of.

Also, the current process within student health care for making appointments typically involves navigating a range of channels, including chatbots and phone calls. This system has the potential to cause frustrations with students as they attempt to schedule appointments. This intern leads to students looking to services such as private health clinics or seeking help from the local health clinics over student health care. The lack of a unified and user-friendly system expands the difficulties that many students are facing within the student health care. This data was based from the data derived from the research and understanding of this thesis. This study does not attempt to change the system but make the user experience and system flow easier to access for students.

### 1.2 Objectives and deliverables

This thesis has two major goals. The first part of the thesis will focus on the theoretical study of the current medical field and what is user experience design and the need for it. The second will be developing a prototype using the process of user experience and testing it with students to observe the overall value of it.

The design of the interface will be rooted in the principles of design thinking, with a primary emphasis on gaining insights and feedback from the students themselves. By using design thinking principles, the primary objective is the engage with the students via interviews and testing during the design process. Such as they're over all perspectives, experiences and over all needs. These will play major roles in the crafting of the design. Their overall insight will help making informed decisions in creating the interface. As well as understanding their paint points and understanding how to solve them with the newly implemented design.

This thesis has the objective of crafting a functional prototype designed for the purpose of testing and assessing the overall effectiveness of the proposed design. The prototype will be developed using design tools, such as Figma and Adobe Illustrator. This prototype will serve as a valuable instrument for evaluating the broader significance of User Experience (UX) in the medical field, with a particular focus on creating an easier way for students to understand symptoms and making appointments via the health care portal.

### 1.3 Project scope

This thesis focuses on creating a better patient portal for the Student Health Care of Finland. The end user of this product will be both Finnish students and foreign students studying within Finland. The project thesis is focused of the methods used in the practice of User Experience. Therefore, it will implement these practices to create a product-based thesis. These methods will be furthered described in chapter two. In short, the product will evolve in three phases. The first phase is user understanding. This is accomplished by conducting in person interviews as well as other research

methods to understand the user's needs. The second phase is prototyping, in this phase the goal is to create a high-fidelity prototype that can be used to test with users. The final phase is focused on user testing and understanding of the products value.

This product thesis is not commissioned by the Finnish healthcare authorities. Its purpose is to stimulate a conversation on potential adaptations to the system, with a specific focus on enhancing the efficiency of healthcare access for students. The author of this thesis intends to share the findings to with the student health care with the desire that it will contribute value to their service to students.

### 1.4 Structure of the thesis

This thesis will be written in the traditional sense. However, the overall thesis type is a product-based thesis and will represent that style of writing throughout this thesis. The author will describe terms that are relevant to user experience and the methods used in the theory part. The subsequent sections of this thesis will be structured represented in the development of a UX-centered product.

Chapter one focused on creating a backdrop of what kind of thesis would be produced, introducing the reader to its nature, and outlining the types of products to be generated. Additionally, it provides insight into the overall flow of the thesis, enhancing the reader's comprehension of its structure.

The theoretical framework chapter of the thesis aims to go into detail about a few things. The first aim is to explain what user experience is and explain the terminology and overall theory of it. When describing the theory of user experience, it is important to comprehensively explain design thinking and underscore its significance in creating user-centric products. The secondary objective of the theoretical section is to expound upon the significance of design thinking within the medical field. This includes a broader exploration of the fundamental user requirements in medical services, encompassing research, and appointment scheduling.

The following chapters are dedicated to the progression of UX design is structured into two chapters along with subchapters to show the process of this product. Chapter three will focus on the understanding and focus on empathizing and defining the problem. Chapter four and five will focus on the design and testing of the product which includes, ideating, prototyping, and testing. Each subchapter outlines the tasks and deliverables, providing comprehensive descriptions of them. These chapters will present a thorough account of the entire UX design process, from the initial problem analysis through to the proposed solution.

Finally in the conclusion the goal is to show what the future of user experience can mean for the medical field. Also, it will include final thoughts and questions to ask for what user experience can mean for making the medical field more accessible.

# 2 Theoretical framework

This chapter includes the theoretical foundation of User Experience (UX) and its application within the medical field. It places a significant emphasis on comprehending the present challenges inherent to the healthcare landscape, while highlighting the potential of design thinking as a strategic approach to solve these issues. Alongside this there will be a description of the theory behind user experience and design thinking. The goal is to show what way in which these processes can be used to solve problems seen in the medical field today.

## 2.1 The medical field landscapes in Finland

The focus of this research will be on the Finnish health care, but more focused on the student health care services. Finland has a health care system with a highly decentralized administrative, multiple funding sources with three provisional channels for services for contact care, they are the municipal system, the national health insurance system, and the occupational health care. Local authorities are responsible for organizing financing for specialized care in the public sector (Kesikimaiki, I. Tynkkynan, L., Reissell, E., Syriä, V., Rachel, B., Karanikolos. 2019, 15-25). Figure 1 illustrates that in Finland, municipalities act as purchasers and fund their functions, whether service provision occurs within the municipality or under regional federations of municipalities, such as hospital districts, with primary and specialist care organized accordingly (Keskimäki & al. 2019, 15-25).

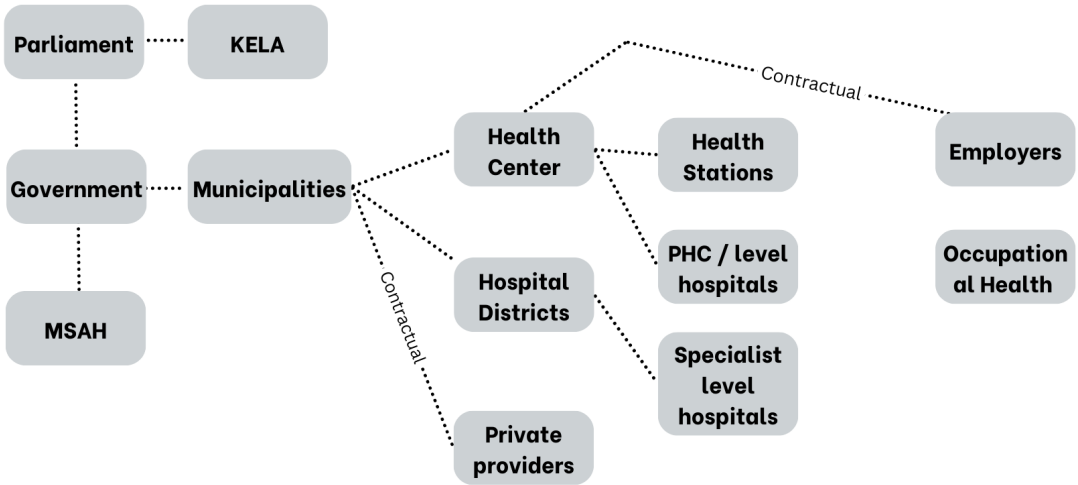



Figure 1. Organizing of the Finnish health care services (Adapted from Keskimäki & al. 2019)

The Finnish student healthcare system, known as Ylioppilaiden terveydenhoitosäätiö (YTHS), is as well funded by the same municipalities structure and rests under the monitoring of the Finnish Institute for Health and Welfare (THL). It manages healthcare centers and clinics strategically located near university campuses and delivers a wide range of healthcare services tailored to the needs of students. YTHS is funded as well by annual healthcare fees paid by eligible students and plays a crucial role in ensuring that students have access to quality healthcare throughout their academic journey (Keskimäki & al. 2019).

### 2.2 Challenges with the health care services

Traditional patient care can be quit passive. This is prevalent when the first-time patient arrives to the doctor seeking help with their medical issue that needs solving. The doctor is the professional and is in charge over the outcomes to the patient. The person therefore receiving the care is simply a bystander observing the caregiver-er. In this scenario there is a lack of understanding with the patient and care giver. There is another style of care that is patient-focus care. In this case each person brings their own experiences and knowledge of the topic during the time for appointments. This means the interactions between the health care worked and patient is vital for giving quality care. In a study on diabetes education in the UK explained that diabetes patients bring their own understanding and beliefs and even their social circumstances when working with a care giver, and the care giver acts more as a facilitator (Windrum & GarciaGoni 2008). This also gives value to the patient because the doctor aims to under-stand them more and give them valued care. It is further argued that having this type of care suited and beneficial for those dealing with chronic diseases such as Diabetes (Hampson & al. 1990).

This is important because n the realm of patient care, it is imperative for individuals to possess a com-prehensive understanding of their medical conditions and be adept at effectively communicating with healthcare professionals. In a previous mentioned study focused on diabetes education, a multi-location initiative was established across the United Kingdom to facilitate educational meetings, fostering awareness and knowledge among patients grappling with this chronic illness. This program was developed to maximize the outcomes of patients in the UK (Windrum & Garcia-Goni 2008). This educational style of care helped the diabetes patients to communicate with the care givers more effectively. This gave the care givers better opportunities to give patient centered care. With the understanding that this style of care is important, the challenge is how to help teach and educate the patient who is dealing with more minor issues. For example, a student going to student health care for a sprained knee or a dental issue. This student will need to learn about his or her injury and be able to communicate that to the caregiver. Ensuring a comprehensive understanding of medical needs, whether the condition is serious or minor, is essential for all types of

patients. This commitment to understanding aligns with the principles of patient-centric care, acknowledging the significance of addressing the unique medical requirements of everyone. The challenge confronting healthcare portals and websites is the facilitation of patient-centric care.

In establishing a patient-centric system conducive to prioritizing patient-focused care, it becomes important to evaluate the fundamental elements that must be considered. This will be further explained in detail later when showing the data gathered from this study. A study conducted in South Africa when considering mobile health technology, came up with a list of items that should in fact be included when it comes to these types of services. Items such as in-depth resources should be included to help give a place for patients to conduct research. In addition, giving a place where someone can locate resources and information easily. Finally giving diagnostic and treatment support to the patients within the portal. It is also important to understand different kinds of users such as expert user and novice users to the system (Ouma 2013). These types of portals though will only be sustainable if they are designed with the user in mind.

### 2.3 Understanding the terminology of design thinking

Design thinking can bring value to patient portals, and overall create essential value to them. In this section the concepts of design thinking and user experience design, beginning with a precise definition of design thinking before delving into an exploration of its attributes and principles. Design thinking is a human based approach when creating new products of re-imagining others. It aims to create innovate ideas and effective business models while focusing on the needs of the people (Müller-Roterberg 2020, 20-23). This could be understood in ways of researchers. Researchers gather information to make informed decisions. Design thinking, as a methodology, not only accumulates information for the purpose of theoretical knowledge but is primarily geared towards addressing and resolving specific user-centric issues. The overall goal of design thinking is to keep the user at the forefront of all decisions. The lead designer at Amazon explains our problem with make products that fail because of misalignment. Product designers are making a product “circle peg” and are baffled when the users “square peg” is simply not interested in using the product or service (Conta 2023).

It is good to note when speaking about user experience is typically dealing with technology and end user design. There is however another term within this field that has implications for the medical field and the service of patients, that is a Service Design. Service design not only deals with the end user but aims to aid value, and it also aims to bring value to the entire ecosystem of a company or service. This can involve the business, internal partners working within the B2B and the

B2C markets. Because you're not only dealing with the end user you are dealing with all areas of the product and service. It can also explain as dealing with the backstage elements of a service to bring value to the front end of a service (Stickdorn, Lawrence, Hormess & Schneider 2018, 35).

### 2.4 Role of Design Thinking in creating better services

Design Thinking aims to examine problems through the lens of users, aiming to discern their specific challenges. In this approach, designers diligently seek to comprehend user needs, identify problem areas, and engage in testing to propose the most suitable solutions. Throughout the product development process, designers adopt a genuine empathetic perspective, considering the user experience and emotions evoked by their products. With this approach, Design Thinking facilitates the creation of user-centered products, ultimately designed for the users' benefit. To show an example of this is the real world we can examine products in the real world, like a door.

Don Norman has been seen as the father of design thinking. In his book "The Design of Everyday Things" he mentions the use of doors and the user experience of them. The door itself can cause user confusion with the use of handles or the language choice of the door.  The door is equipped with multiple signifiers designed to convey its operation. Prominently displayed in large lettering, clear instructions direct users to pull the door toward themselves to gain access. Furthermore, a substantial metal handle is thoughtfully incorporated, providing ample space for users to comfortably grip and facilitate the door's inward motion. However, there are instances when doors may lack intuitive usability, leading to situations where visual cues suggest a 'push' action, yet the correct operation requires 'pulling'. In essence, every human interaction with an object, be it a physical entity like a door or a digital product, can be deconstructed into two essential components: what the object communicates as permissible actions and what actions are functionally allowed. Signifiers serve the role of signaling the user about possible actions, as exemplified by a door handle indicating the option to pull, or a plate on a door suggesting the option to push. Affordance, on the other hand, represents the specific actions that can be taken, as demonstrated in the case of a door, where the options are limited to pushing or pulling (Norman 1988).

This is important because all things we interact with daily will have user pain points, and making all products human centered to fit the needs of all users. "Human-centered design is an approach to creating a program, policy, service, or product that is tailored to the needs of the person who will use it or be impacted by it (Bloomberg Cities, 2019). It is an approach that is grounded in the philosophy that empowers individuals or teams to craft products, services, systems, and experiences meticulously tailored to meet the fundamental needs of those encountering a particular challenge (DC Design 2017). There are certain stages that teams will use when implementing design thinking to their products. In Don Normans book "Design of Everyday things", he proposes four stages

when it comes to design thinking. The stages proposed by him are Observe, Ideate, Prototype, and Test.

### 2.5 Design thinking stages

The four stages are design thinking are equally important. They can also be broken into further stages. These stages are proposed by the Institute of design. The primary phases encompass the following: Empathize, Define, Ideate, Prototype, and Test (Interaction Design Foundation 2021). As seen below in figure 2 it represents the stages given forth by the Norman Nelson group. The Interaction Foundation presents the stages similar but worded in a different manor. The Interaction Foundations stages are Needs, Analysis, Design, Prototype, and Deploy. In this section we will aim to briefly examine each of these phases of Design Thinking and provide the framework for the design seen in this thesis. Seen in figure 2 shows the process and how each step is interconnected with one another (Gibbons 2016).


Figure 2: Design Thinking framework (Norman Nelson Group s.a.)

#### Empathize

Empathizing is the first phase of design thinking. In this phase the aim is to thoroughly comprehend the individuals for whom the product or service is for. This involves observing their behavior, identifying their challenges, and assessing their interactions within the service or product they are using. Throughout the observational process, comprehensive notetaking, and data recording to formulate a well-informed assessment of the issues that require resolution. There are many ways to understand and empathize with the users. In an article by Norman Nelson group, they explain user understanding by contrasting what users say and what users do. The approach could involve considering the perspectives of users, encompassing their thoughts and emotions regarding a particular situation. Attitudinal research involves recording individuals' responses to questions about their overall experience, assessing aspects such as intuitiveness, problem-solving capabilities, and alignment with their goals.

John Whalen in his book “Design how people think” proposes the best way to empathize with the user is to implement contextual interviews. This means spending time with the user while they use a service and product and interview them while they are using it (Whalen 2017). Empathizing serves as a pivotal step in enabling designers to form a comprehensive understanding of the end user, thereby facilitating a more holistic and nuanced perspective on the product's target audience. The tools used during this thesis will include interviews, surveys, personas, and user story maps.

**Define**

The Define stage is the gathering the research and begin brainstorming the problems and pain points. Designers dedicate their efforts to comprehension of users' motivation, objectives, decision-making processes, challenges, and pain points (Conta 2023). Methods include methods such as sketching, mapping, and create user profiles and journeys. Identifying the driving forces behind their actions, pinpointing the sources of frustration they encounter, and delving into the crucial aspects of their objectives and the impediments they face in reaching them are essential areas that require in-depth exploration. It is through this understanding that designers can craft experiences that help users avoid obstacles and successfully achieve their goals (Conta 2023).

**Ideate**

Now that there has been a problem stated it needs to be solved. This is accomplished in the ideating phase of the process. Ideation, a creative phase, involves generating a multitude of ideas to develop user-centric problem-solving concepts. It emphasizes the importance of first defining a clear problem before considering solutions. Ideation is a process that encourages the exploration of many ideas and possibilities to ultimately arrive at an effective solution (Interaction Design Foundation 2021). This phase is about generating ideas and putting them all out on the table to choose

which one might solve the users pain points best. It's not about coming up with the best and right idea, it's about generating a broad range of ideas (Plattnor 2010).

**Prototype**

In this phase the goal is to make a solution prototype to visualize the solution to the user. This is meant to be low-cost and simple, rather than implementing a full system without testing. The purpose is to develop a prototype, tailored to the needs of those directly affected by the issue. The previously learned phases should be also noted heavily. The paint points identified should be solved by the solution. Furthermore, the prototype should be guided by the user stories crafted in the ideate phase. In the case of both physical and digital products, this prototype typically embodies the envisioned design concepts (DC designs 2017). One effective way in prototyping is to create two solutions and conduct A/B testing of the solution. Typically, today most teams are designing products on tools such as Figma and Sketch and using them to build interactive prototypes. In service design, prototypes can be simpler or even something such as an MVP (minimal valuable product) to test.

**Test**

Testing can be conducted in a few ways. The common way is to have the users go through a set of questions and tasks to accomplish on the prototype. This as well can be tested by checking with eye tracking tools or touch point tools to see if the user is able to navigate thru the prototype. The data then will be collected and looked over. There are often new problems that will come into light that also need to be investigated. Therefore, teams will redefine the solution and make necessary adjustments after testing (Interaction De-sign Foundation 2021). Testing can be done again after the changes were made to the first prototype. This can give designers more ability to solving further pain points even in their prototypes.

**Accessibility**

Accessibility is also worth considering, especially when dealing with the medical field and website and portals. These principles have been regarded as website accessibility standards. These standards aim to help all people can access and use your website effectively. These guidelines underwent a comprehensive revision and reorganization with the release of the second edition of the Web Content Accessibility Guidelines (WCAG 2.0). The revised criteria were intentionally designed to be technology-agnostic, ensuring their relevance and applicability in future contexts. They were structured around four fundamental pillars, the POUR principles: (1) Perceivable, (2) Operable, (3) Understandable, and (4) Robust, represent the core tenets of digital accessibility (Vollenwyder & Petralito 2023). These standards are very important in the context of the medical

field. The portal should be able to allow any user with any condition be able to access and use the online resource.

# 3 Research and Understanding / Define

As mentioned above this thesis is a project-based thesis and will focus on creating a testable proto-type. The aim and goals of this project can be seen above in chapter one. In this chapter, the primary objective is to understand the research and gain insights into the perspectives of students studying in Finland. We will delve into the various research methodologies employed throughout this the-sis, and subsequently, we will analyze the data to derive valuable insights. Furthermore, following the standards of design thinking, this chapter would represent the understanding phase of the process.

## 3.1 Methodologies

There are a variety of methodologies used in the understanding phase of the design thinking process. These are all used to help the designer understand the user of a product more effectively. There were many tools and methodologies used in the development of this project. In this chapter, the progression will be structured systematically, commencing with an exploration of the methodologies employed to understand and frame the problem. These methodologies include SWOT analysis, competitive analysis, heuristic evaluation, and an examination of user pain points via surveys. Subsequently, the chapter will transition into a more qualitative research phase, involving in-depth interviews with students. The understanding will lead to analysis of the collected data, leveraging tools such as personas and journey maps to provide a comprehensive perspective.

## 3.2 Identifying the problem

To identify the problem, it is essential to do further investigation about what is happening in the medical field now and how are people using these tools and resources. This section will follow each methodology used in research and give a brief explanation of the results.

## 3.3 SWOT analysis

A swot analysis helps frame where the current solution of a product is at. The current portal of the student health care was the main consideration, as well as the overall thoughts of the health care services. The main use of this tool was to grasp what were the main strengths and weaknesses of the current website and system. The current system has lots of data and information. It would be a great opportunity to organize this data so that students could access the information in a less restricting way.

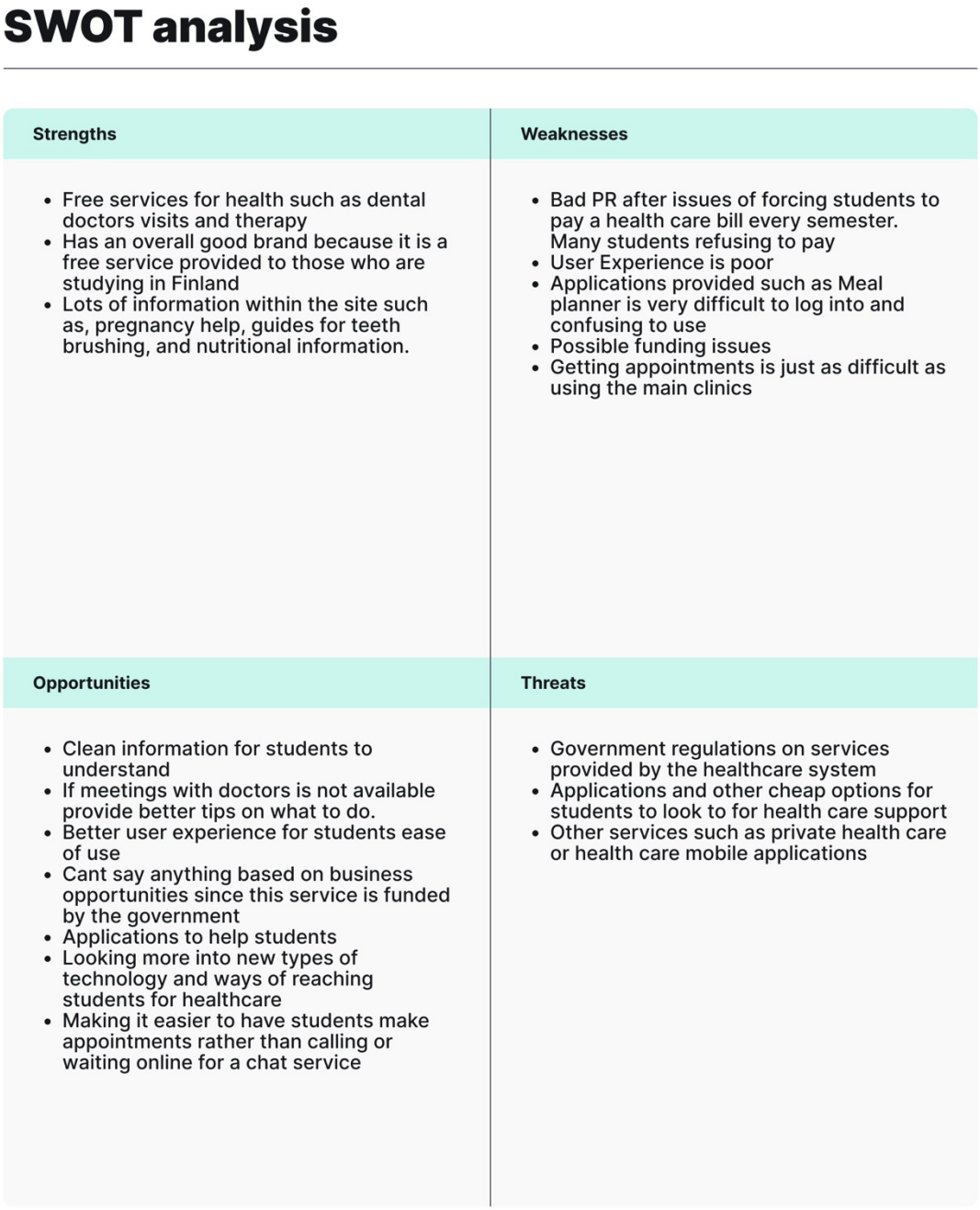



Figure 3: Swot analysis based on author's research

### 3.4 Competitive analysis

The competitive analysis is used to study all the solutions offered in Finland such as private health care and other various health related applications. The assumption by the author of the thesis was

that students would desire to have more services. Therefore, this competitive analysis reflects that assumption. To investigate this premise, a comprehensive competitive analysis was undertaken, focusing on the examination of tools utilized across Europe for scheduling online appointments with healthcare professionals, in addition to tools designed to address mental health and fitness needs. It was discovered that there are many health-related applications available within Europe. These applications offer a unique way of contacting doctors personally via chat and video call. Also, there are other applications that help with mental health and exercise. Teledoc which is a mobile application offers a simple booking system that might resonate with students. One chooses a type of symptom and your free time and choose the doctor. Doctor on demand offers information about well-being within their website.

There are two main private health care options within Finland. They both offers all the same services compared to the student health care. They give the patient the ability to choose which doctor they want that can help solve their health care issue. Furthermore, these companies give the user the ability to have a self-chat 24/7 to help them with their medical decisions.

| | yths | Teledoc | Terveystalo | Mehiläisen | Doctor on Demand |
|---|---|---|---|---|---|
| Appointment bookings | This is only done by calling or a chat service which never has open times | Scheduling system within the application showing free times | Available to make appointments | Available to make appointments | Ease of appointment making based on doctors free times |
| Nutritional guides | Using an application called meal planner which is very hard to use | Does not offer on website, possible offered by doctors on visits | Available from the private doctors | Available from the private doctors | Doesn't have this service |
| Well being courses | Links and videos to watch | Offered by doctors if needed | Doesn't have this service | Doesn't have this service | Links with information on the site, doctors also can assist with this |
| Exercise help and guides | Doesn't have this service | Doesn't have this service | Offered health advice from doctors but not exercise | Offered health advice from doctors but not exercise | Doesn't have this service |
| Chat service | Yes, but very slow and hard to connect | Yes | Yes 24/7 option | Yes | Yes |

Table 1: Competitive analysis

# 4 Further student understanding

To gather user pain points, a survey was distributed to 60 students currently enrolled in Finnish universities or schools of applied sciences. Approximately half of the recipients, totaling around 30, participated by completing the survey. The subsequent section outlines the survey's structure and presents the insights derived from the responses to each question.

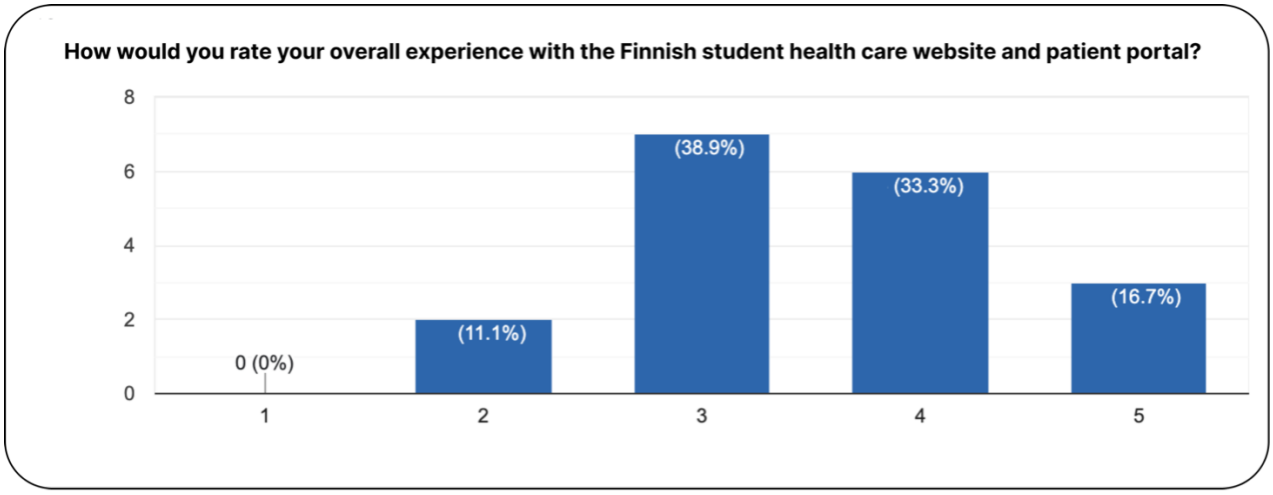



Figure 4: Question How would you rate you experience in the patient portal (n=30) (5=Extremely satisfied, 4=Satisfied, 3= Okay, 2=Not satisfied, 1=Disappointed)

It was interesting to see that most people rated the experience in the middle. This might have been due to the students not knowing how to answer the questions, or if they didn't fully form an opinion on the topic. This might be due to the open-ended nature of the question in the survey. Later during interviews, it would be understood that there was more issue that students had with the service provided.

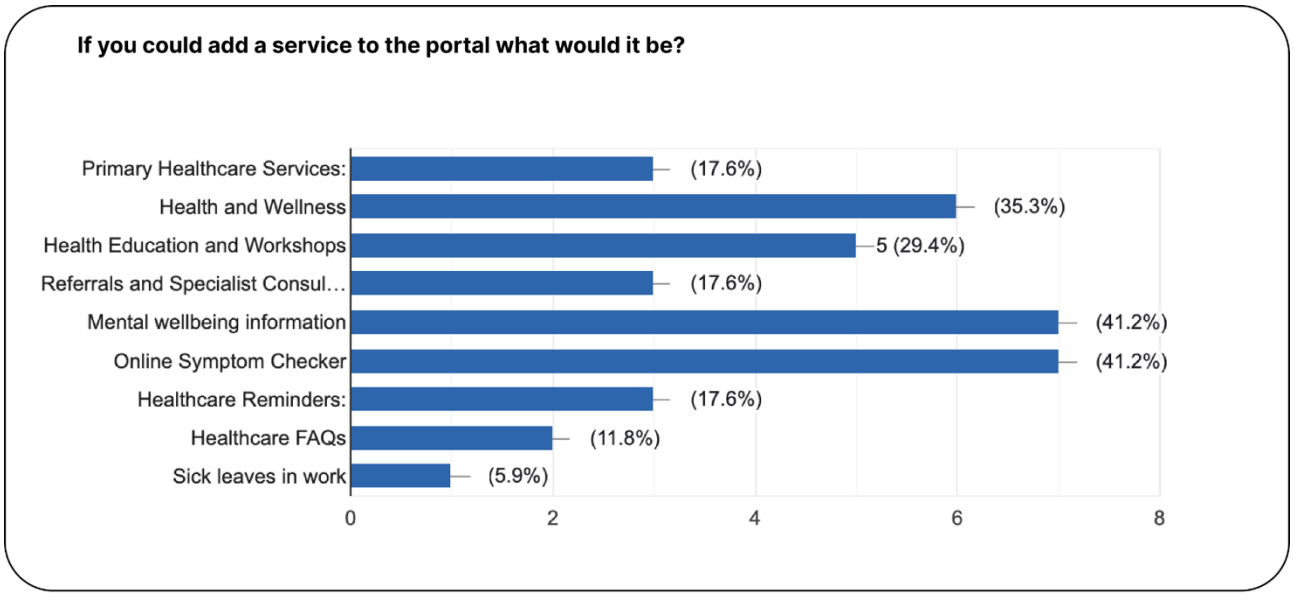



Figure 5: Question If you could add and service what would it be? portal (n=30) (5=Extremely satisfied, 4=Satisfied, 3= Okay, 2=Not satisfied, 1=Disappointed)

This question was aimed to understand what were the main valued content that students would find most useful. Additionally, it underscores the importance of providing comprehensive information to assist students in making informed decisions regarding their healthcare. To note again the assumption was that students would desire more services to assist them while using the student health care.

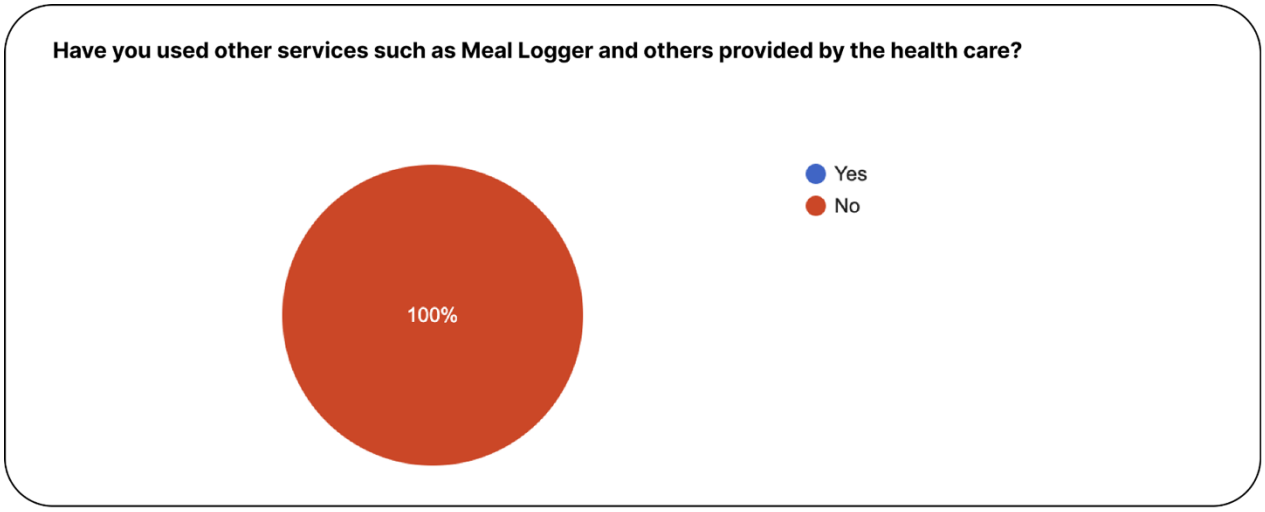



Figure 6: Question Have you used other services? (n=30)

It was particularly notable to discover that several other healthcare services and applications were not actively utilized by students. It would be a matter of considerable interest to delve in a future study the reasons behind this non-usage and the associated motivations. Nonetheless, for the

scope of this research, this observation has contributed valuable insights which will be covered later.

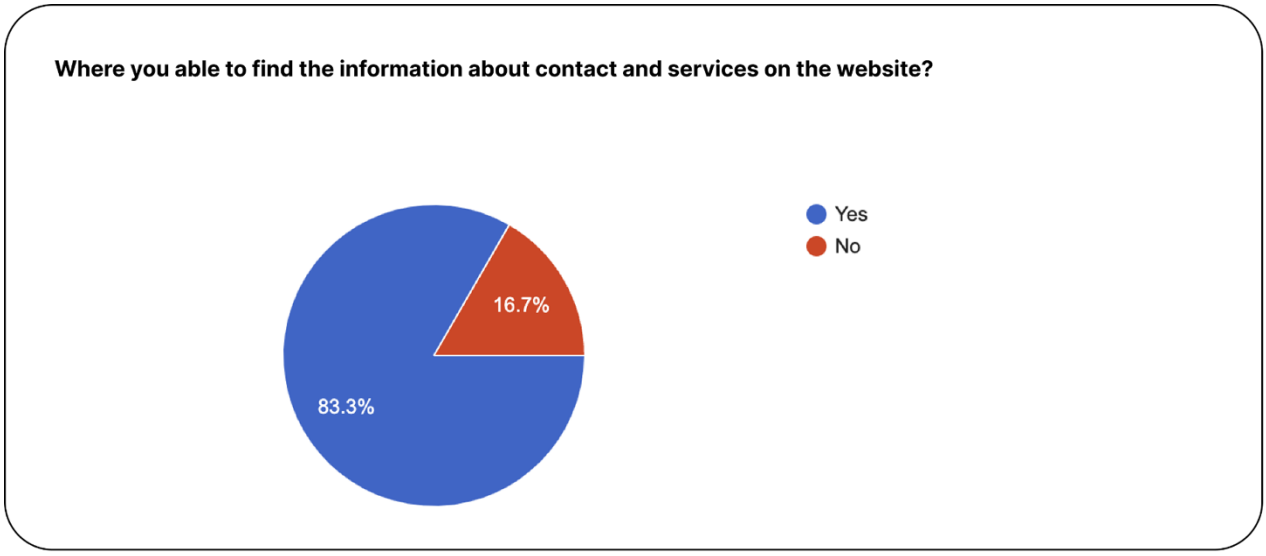



Figure 7: Question Where you able to find information? (n=30)

This insight is valuable in enhancing our understanding. Given the earlier assumptions regarding the potential difficulty in locating information, this question will serve as a point of focus in the up-coming one-on-one interviews to delve deeper and gain a more comprehensive understanding of the issue.

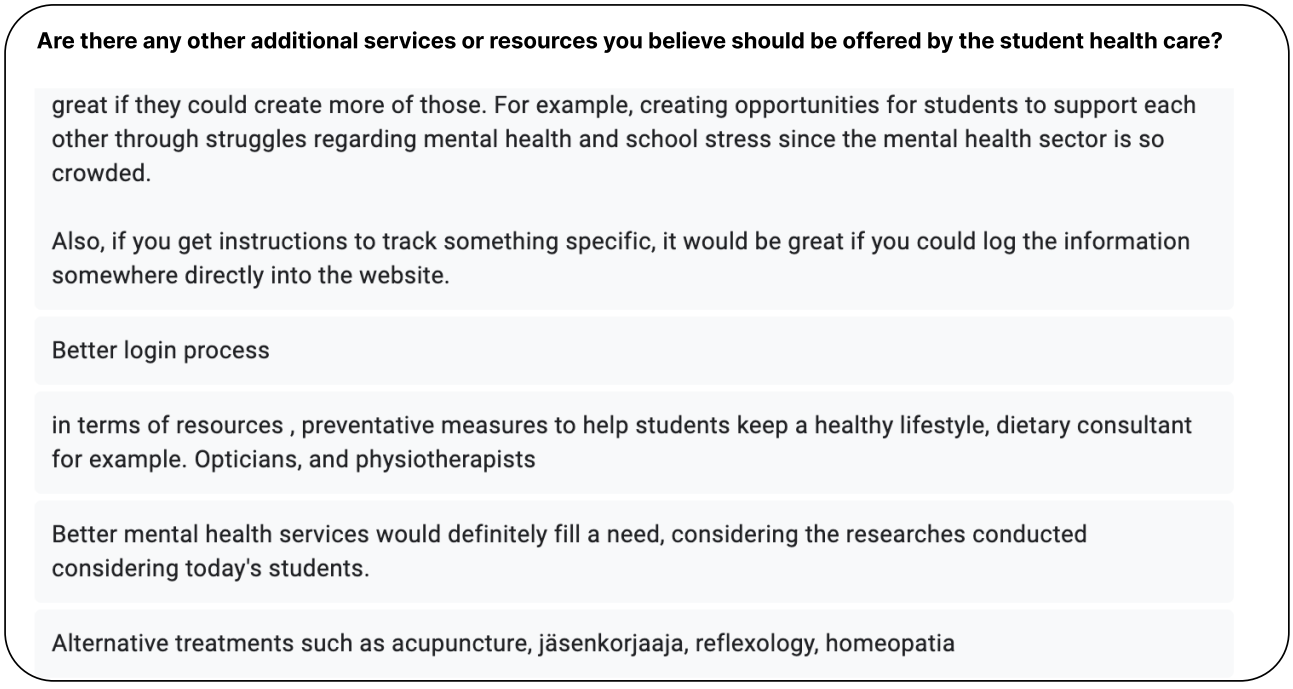



Figure 8: Question What additional services or resources should be offered? (n=30)

The final question to show here is the top responses gleaned from an open-ended inquiry. Contrary to the initial assumption that students were primarily seeking additional services, it became evident from the responses that their priority lay in enhancing the accessibility of the existing system rather than introducing new services.

### 4.1 “How might we” statement

The next step for the understanding phase is to frame the problem. This can be done first by writing out HMW “How might we statements”. These are typically written by teams to help understand the solution and frame what problems the users are having. Teams will formulate HMWs when with projects that lack specificity and alignment with the findings of their discovery research. For instance, a question like “How might we” improve the user experience of the product? This may not directly correspond to the specific issues and insights uncovered during the research phase. Such a broad question may lead to solutions that fail to address the root problems and nuances revealed through research. When crafting the how might we statements for this project it was important to consider the new insights from the surveys and research. Also, knowing that after framing the problem the next step would be to conduct interviews with various students. The cards represented by sticky notes have been organized to show the top ones in red that were being higher in value for the product (Rosala 2021).

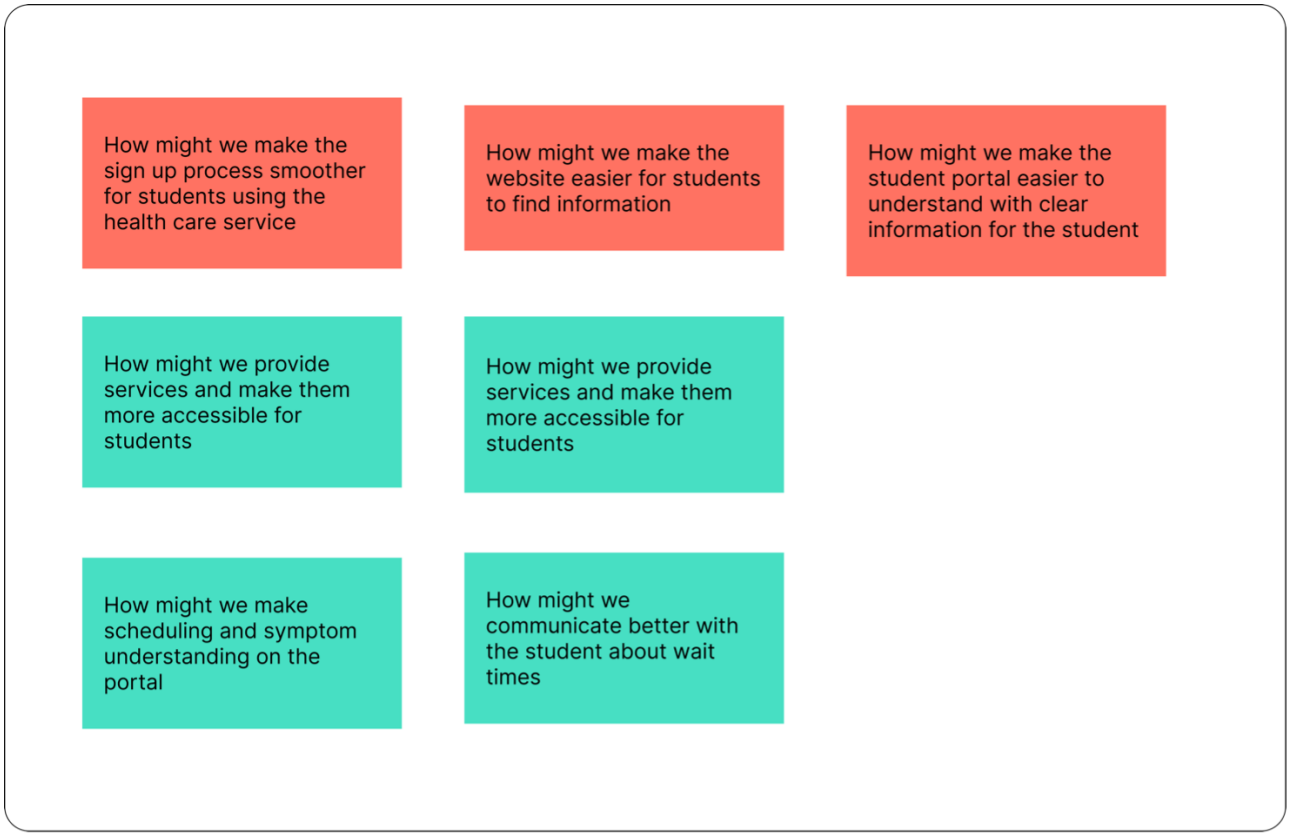


Figure 9: “How might we cards” Created for this thesis

### 4.2 Heuristic evaluation

The next step in this stage was to investigate what are the heuristics of the current implemented website and patient portal. According to Norman Nelson group, a heuristic evaluation is a method for identifying design issues in a user interface by assessing it against a set of guidelines, or heuristics, aimed at ensuring usability. Jakob Nielsen's 10 usability heuristics, rooted in an understanding of human behavior and psychology, are commonly recommended for assessing general usability (Moran 2023). There are many methodologies for conducting a heuristic evaluation. The author of this thesis chose to use “Information Architecture Heuristics” by Abby Covert as the template for the evaluation (Covert 2021). Seen below is the methods of this evaluation and the importance of each section.

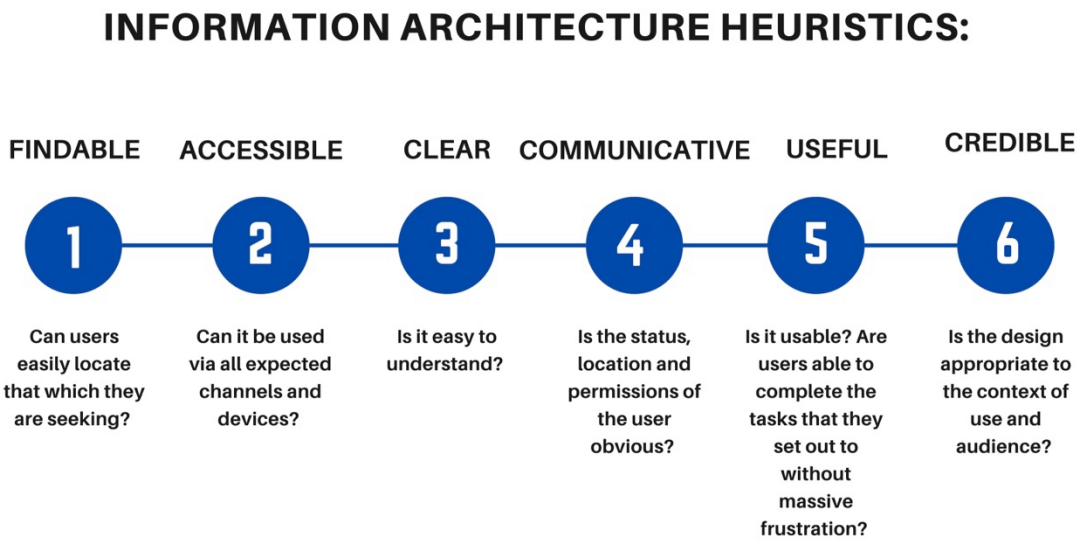



Figure 10: Information Architecture Heuristics (adapted from Covert 2021)

To keep this section brief we will only view of few of these and see some of the notes that have been observed by the author with the current website implementation.

Clear- There are places on the site that feel congested, and many times overwhelm the user with too much information. There is a search feature which helps the user locate information when needed. The text on the portal can be hard to understand for international students, due to it not being translated fully into English. In the portal is hard to understand how to effectively make an

appointment and where to do it. Furthermore, during the accessibility testing of the site it was noticed after running an accessibility test there were readability concerns. These challenges were attributed to contrast issues within the site, impeding readability and causing difficulties for users.

Communicative- The landing page provides a wealth of valuable information, offering in-depth details about symptoms and the requisite treatments for various illnesses. The language used is readable and easy to understand but written as if it were from a textbook. The issues are that this information his hidden behind many links and tabs. It can be very difficult to re locate information is the user has forgotten where they just were. On the portal there isn't a color change when seeing notifications. It makes it difficult to know what areas urgent and which ones are not.

Useful- The information on the website and portal has major uses. But it has usability issues when finding these links and information. New users often find it more convenient to directly log in to the system without utilizing the landing page. This insight, corroborated during interviews, reveals that a significant number of students primarily visit the website solely for the purpose of accessing the patient portal.

Delightful- The current patient portal is not only congested, but it also can be hard to understand what kind of appointments are upcoming and why. There are not many expectations from students when using the system. They simply want to log in and view information and make appointments. This at times is not being meet, because there are useability issues within the site and portal.

### 4.3 Interviews

Interviews were conducted with six students who are studying in Finland. Those who were interviewed came from various universities in Finland as well as various ethnic backgrounds. The interviews were conducted in person and took the form of a semi-structured interview, emphasizing not only the need of structured answers but also an exploration via discussion to explore the pain points and user needs to gain a comprehensive understanding. Each interview took thirty minutes to conduct and were recorded transcribed and analyzed. Seen below are the list of questions that were used for the interviews. After conducting the interviews, the collected data underwent analysis using the Miro tool. Detailed notes were meticulously organized and categorized into sections to facilitate a deeper comprehension of the data. This systematic approach ensured a thorough examination of the gathered insights. These notes can be seen below in figure 12.

## Interview Questions

Question #1 - What school are you attending and what is your major?

Question #2 -Are you familiar not only with the Finnish student health care, but also the types of services it offers

Question #3 -When was the last time you used Finnish Student health care?

Question #4 -How do you solve your medical needs?

Question #5 -What are your motivating factors for looking up information about medical, mental health, and physical needs?

Question #6 -What are your motivations for visiting the student health care portal?

Question #7 -What are your frustrations with website and the patient portal? Do you enjoy using both of these solutions?

Question #8 -Do you find it hard to navigate the page and portal? What makes it easy/ What makes it difficult?

Question #9 -Are there services on the current implementation that you use? How might they be improved on?

Question #10 -What kind of services do you value? As well what do you value the most when it comes to medical care?

Figure 11: Interview questions

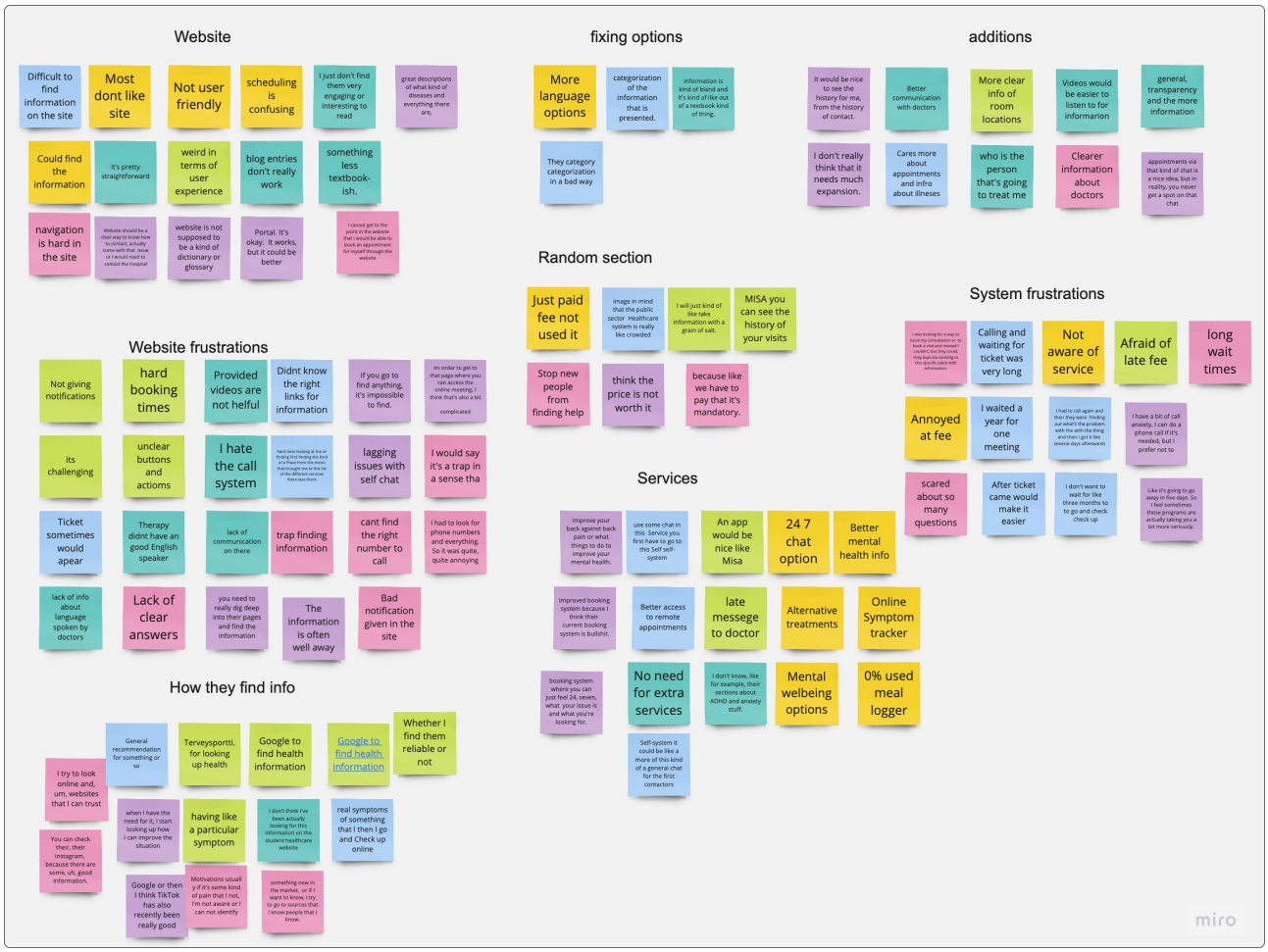



Figure 12: Analyzed Interview Data

The interview data was systematically categorized into eight sections, each interconnected to provide a deeper understanding. Key aspects of the data pertained to the website's functionality, the overall user experience, and insights into the healthcare services offered.

Many explained that the website had lots of good information on it. How-ever, it was difficult to locate and was categorized in ways that made the location hard to remember. One common thread in the data was that users do not like the scheduling system. They explained that there was a lack of communication with the system about their expected wait time for an appointment. One mentioned that they don’t understand the language used on the portal because they only read English, but the portal will not translate part of the scheduling section.

One of the major finds during this research was the service section. It was an assumption from the start of the project that students would need more services offered by the system. This were assumed to be services that could assist the patient online such as applications and online tools. This assumption was found to be false after reviewing data from the surveys and the interviews. This

wasn’t the case after learning about the needs of the students via interviews. Several interviewees expressed a preference for improved information accessibility and an enhanced appointment scheduling system. Notably, one participant mentioned utilizing the site solely to check appointment times, with a specific emphasis on prioritizing these essential functionalities over additional services.

The last notable takeaway from this data was the frustrations. Many mentioned they were not happy with the wait times in the system. As well as no knowing what forms and documents that were required to bring to the appointments. The booking information would sporadically surface without any notification or clear representation on the student's page, leading to potential challenges in the booking process.

### 4.4 Personas

Drawing from the conducted research, a set of personas was designed for the user representation and address identified pain points. Personas are conceptual characters crafted by designers through user research to embody various user profiles that may engage with the service, product, or brand (Interaction Design Foundation 2021). A persona serves as a comprehensive gathering of the data derived from the research. The creation of personas typically involves considering factors such as the user's needs, goals, and attitudes toward the app. Additionally, demographic information, including age, gender, and occupation, is considered. It's important for designers to concentrate on relevant aspects related to the application rather than delving into every minute detail of user characteristics.

Before creating the user personas, it is necessary to examine the previously learned data so that the persona is rooted in actual user behaviors rather than relying on assumptions brought by the de-signer. The use of personas helps guide designer to develop user-centered designs, guaranteeing that the products are tailed to fit the user needs. In the context of this thesis project, the data analyses were conducted to ensure that the persona would fit the user needs and represent the needs to a student studying in Finland. There are various types of formats to create user personas. The major foundation in them aims to show the users goals, challenges, and background. The persona created for this project focused in on goals, behaviors, pain points, and types of devices used.

The primary persona used for this project is seen in figure 13. This persona is a girl named Ella who is 25 and currently studying full time in Helsinki. Her main goals focus on saving time for making appointments. Also, she wants to see more information about the doctors so she can mentally be prepared for the language needed. Her perception of the current implementation is

characterized by difficulty, due to a lack of clear information. As a student with time constraints, she faces challenges navigating through a website cluttered with links and pages. The key attribute defining her persona is a proactive and prepared approach, driven by a desire to be well-informed and ready for upcoming events.

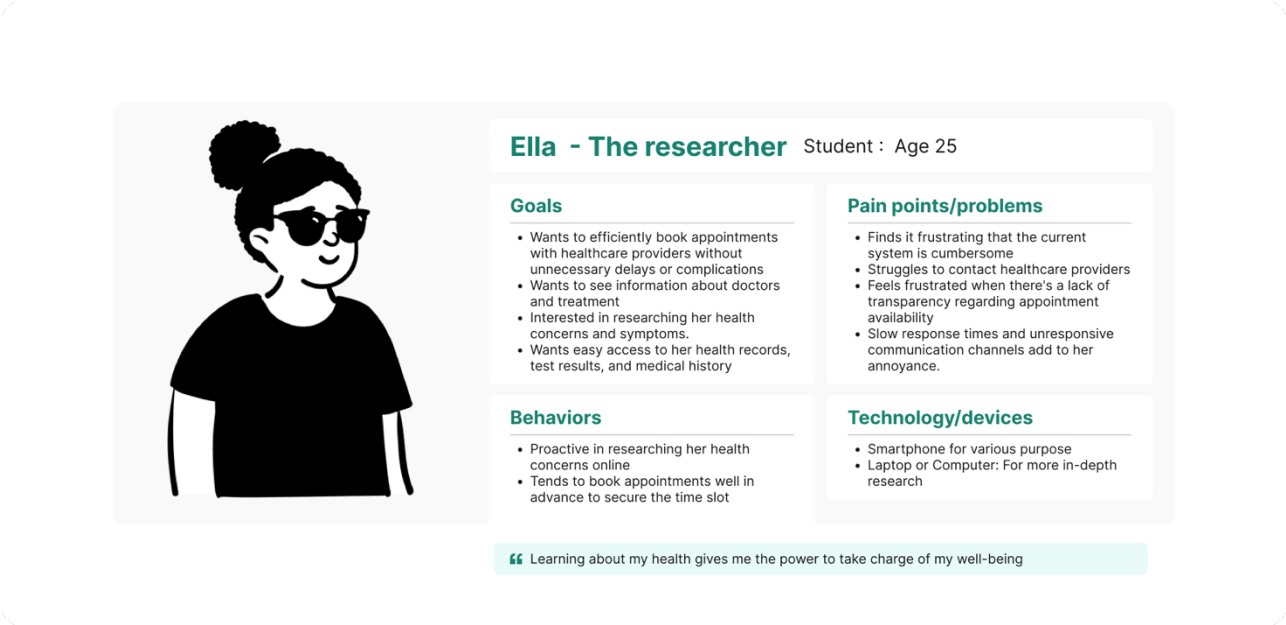



Figure 13: User Persona

### 4.5 User Journey Map

After finishing the persona, the next step is to create a user journey map. User journey maps serve as visual representations that outline the evolving relationship between a customer and an organization across various channels of interaction. Design teams leverage these maps to assess how customer experiences align with expectations, identifying areas for design enhancements and improvements (Interaction Design Foundation 2023). The journey map guides the persona as if she were walking through the current implementation of the website and portal. Each of the phase's represent stages on her journey on the site. The goal of this journey map was to show the full experience that a student might have used the current website. The data taken from the interviews and research was used to formulate this map.

Seen in figure 14 Ella is visiting the website to look up information regarding the student health care. She finds herself becoming confused at the language used for the log in process as well as the large amount of hidden information. Step two the log in process isn't as difficult for her, because it is the same process used by many Finnish government systems. She simply needs to know her bank log in information and can access the patient portal. Her biggest frustration is making an appointment. She cannot locate the right location for the phone number contact on the

portal. Also, she would rather do a chat instead of calling, but this system is either down for the day or too busy to accept new chats. The final step for Ella is viewing her upcoming appointments and information on the page. She has problems locating the information that she needs. This takes her time from studies since she needs to search for the booking request and forms required. But all in all, she is happy that the process wasn't too difficult for looking up booking times.

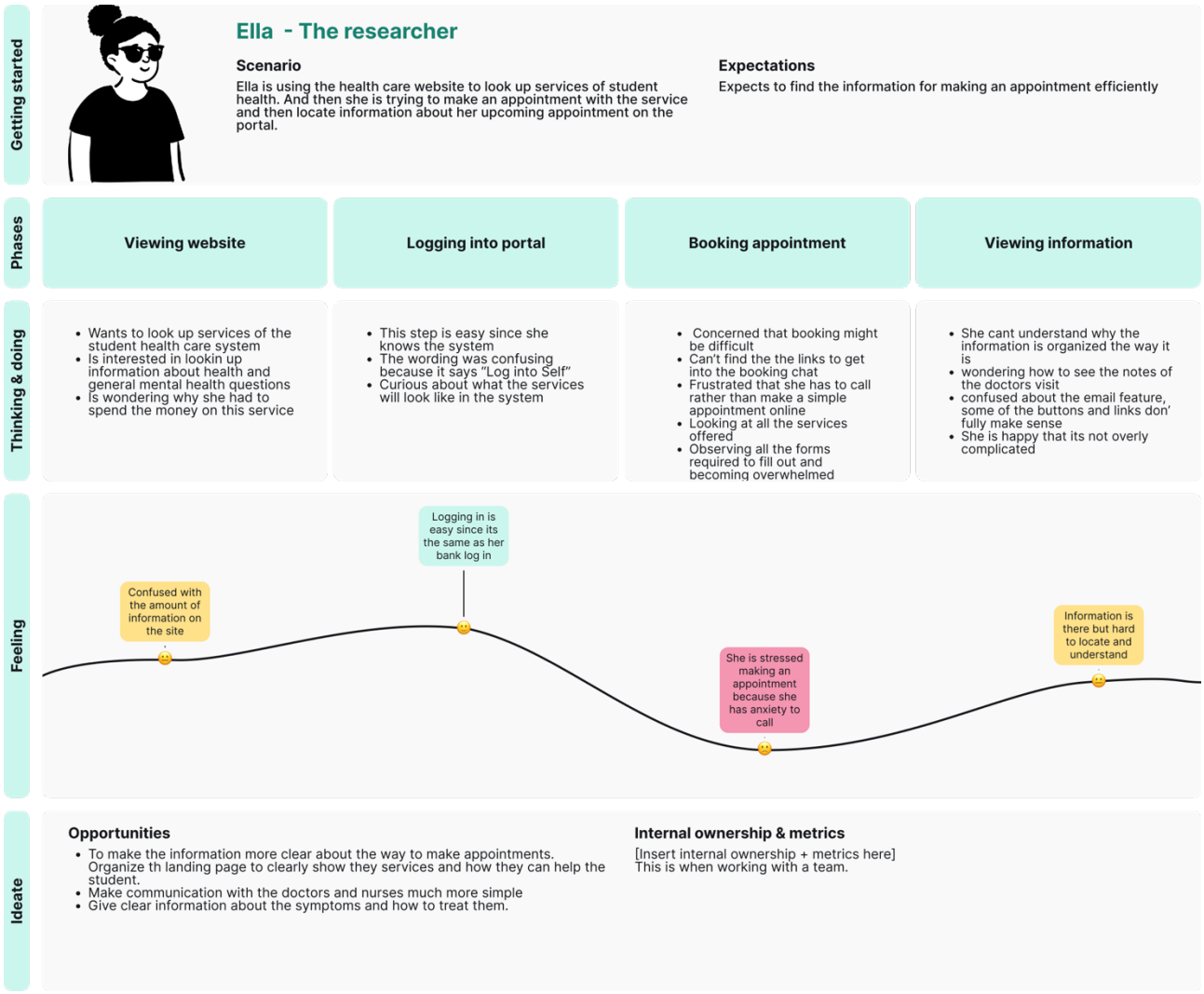



Figure 14: User Journey Map

## 4.6 Story mapping

When creating the story map there is a goal to consider how to solve certain pain points of the user. A user scenario is a narrative depicting individual engaging in a sequence of actions within a specific context, utilizing an application or website. These scenarios should be practical, straight-forward, and universally comprehensible. A well-crafted scenario has the capacity to encompass sufficient requirements for a development project. Leveraging scenarios afford designers authentic insights into user experiences right from the project's inception (Benyon 2019).

It is common to set up an overall goal of the user story and brainstorm different ways to solve that goal. In the case of this project the overall goal was simple, “make the student portal easier to access and scheduling appointments more streamlined”. Moreover, to address this objective, the narrative can be segmented into multiple epics. An epic is fundamentally a comprehensive scenario depicting a user navigating through a process on the app or site. The formulation of an epic follows the structure: 'As a user, I want to [goal] so that [benefit/reason].' In the context of this project, four key epics were identified to facilitate the achievement of the overarching goal. Each epic is accompanied by a delineation of the sequential steps taken by the user within that specific epic. Following that assessing whether each user story can be further detailed into tasks and present them beneath the corresponding user story. Finally taking each phase and evaluating if each task can be further deconstructed into sub-tasks, and list them below the corresponding task.

In the case of this project there are four epics on this map. These all will help guide the persona Ella as she visits a new website and portal to receive student health care. The initial epic involves guiding Ella through the landing page and the process of logging into the portal. Subsequently, it focuses on enhancing her navigation experience, ensuring the visibility of the login button with improved contrast values. This aims to solve the pain points seen in the research dealing with issues of not understanding how the different log ins work and not being able to see the log in button. The subsequent epics, two and three, center around the process of making appointments. This discovery emerged prominently during the research phase of the project, indicating that many students encounter difficulties and frustration with the existing booking system.

The concluding epic aims to assist Ella in comprehending medical issues. However, this epic underwent modification later in the project to align with a symptom checker functionality. The goal is to empower Ella to look up symptoms, providing information to guide her through the appointment booking process or offering simple recommendations if the symptom is not severe.

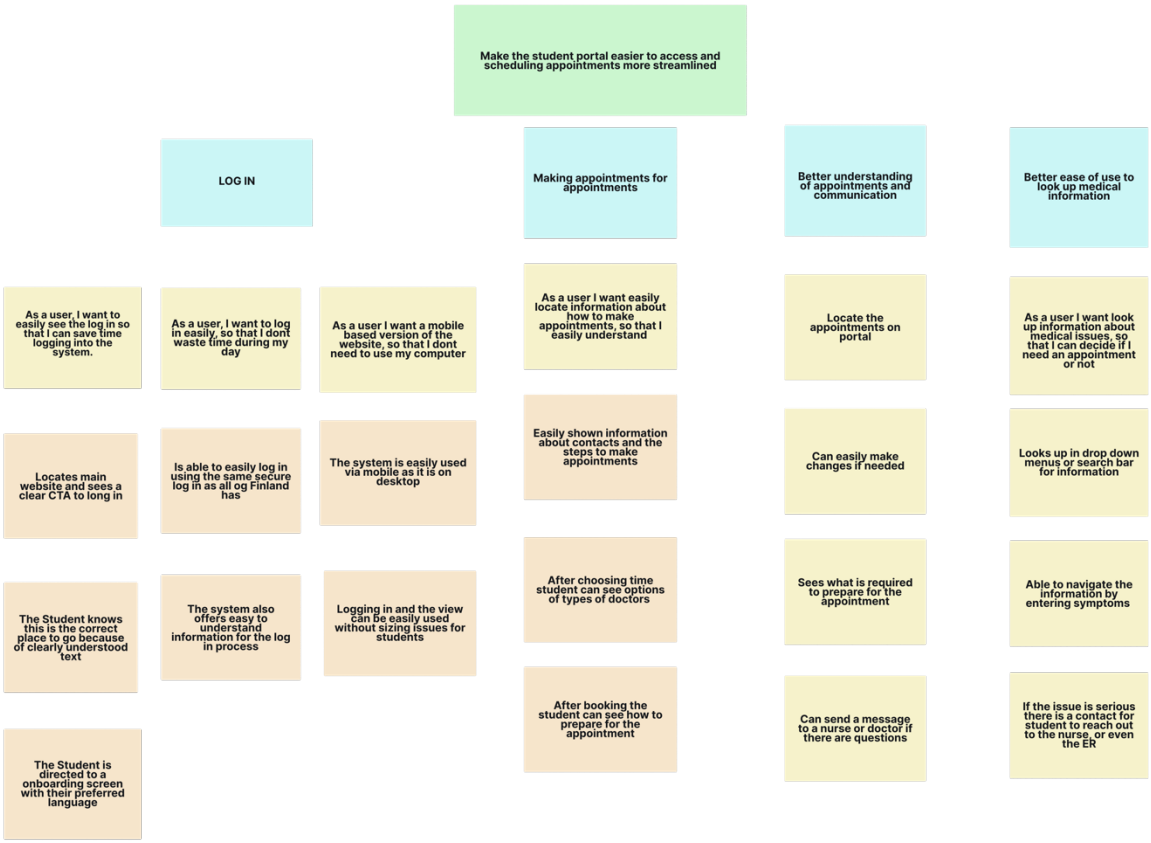



Figure 15: User Story Map

# 5 Designing the prototype

After crafting the user goals the next step is to consider what will be the user's journey through the system. This design phase is known as "Explore". During this phase deep consideration must be taken on how to solve the user goals and desires.

## 5.1 User flows

User flows are graphs that represent the steps that the user will take will navigating in the interface. These user flows represent the user stories that were created for the project. This can also include brainstorming to understand how this solution is solving the pain points. This typically is conducted as a team to gather input of the users. The author of this thesis brainstormed and meet with experts in the field of medicine from local clinics to see what their opinions were over the solutions. Brainstorming is a strategic ideation technique employed by teams to address well-defined problems. Collaboratively, the group generates ideas aimed at solving a specific design problem. The effectiveness of brainstorming hinges on having a clearly articulated problem to solve; this framework allows the team to systematically conceive solutions in response to the identified problem (Conta 2023).

In this project the author used FigJam to represent the user flow. Each epic from the user story was taken and create into a user flow. After finishing each user flow, more brainstorming was conducted and then more flows were made.

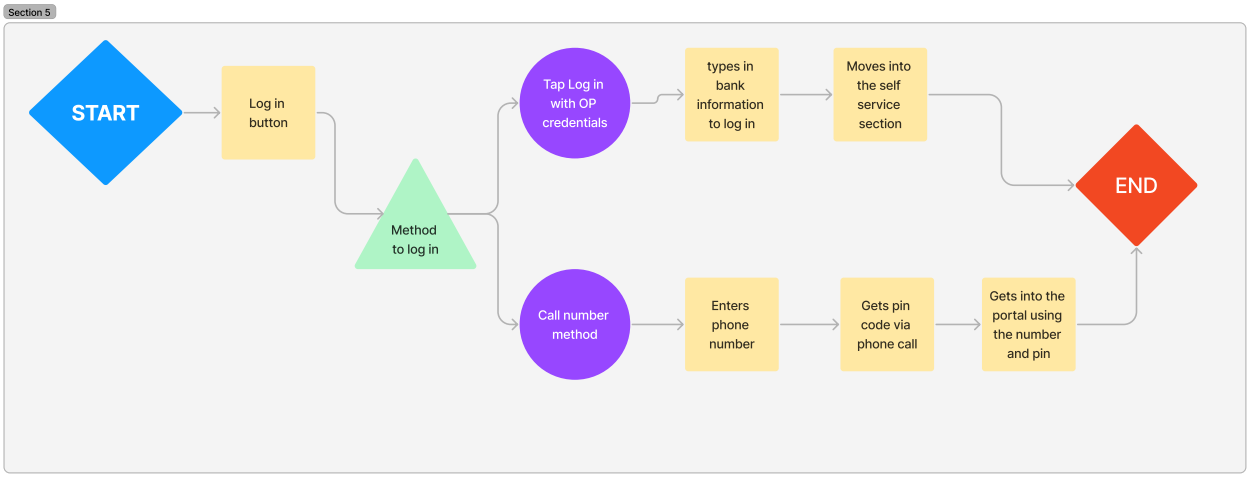



Figure 16: User flow chart 1

As illustrated in Figure 16, the initial depiction outlines the user login process, highlighting the two forms of login and proposing strategies to streamline the procedure, thereby enhancing user experience, and alleviating potential pain points for students.

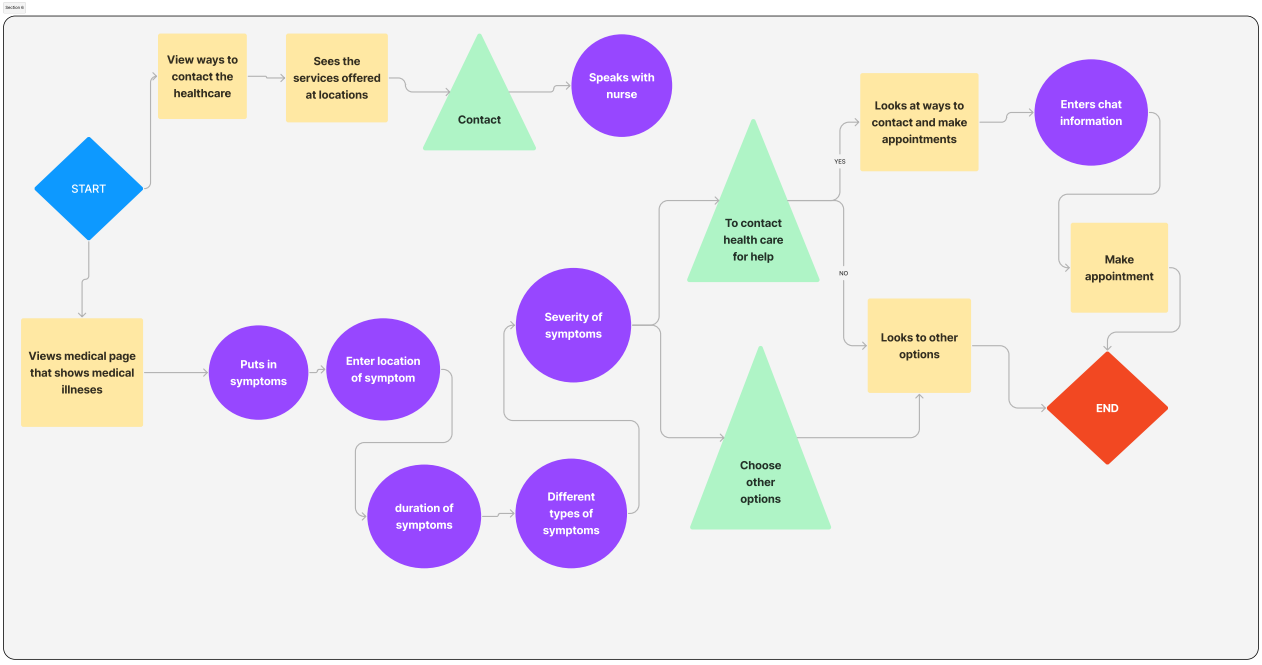



Figure 17: User flow chart 2

Figure 17 illustrates the symptom checker, designed to facilitate users in systematically looking up articles and information related to their symptoms. Additionally, it provides guidance on whether these symptoms necessitate a visit to the health clinic, offering users a comprehensive and informed approach to managing their health concerns

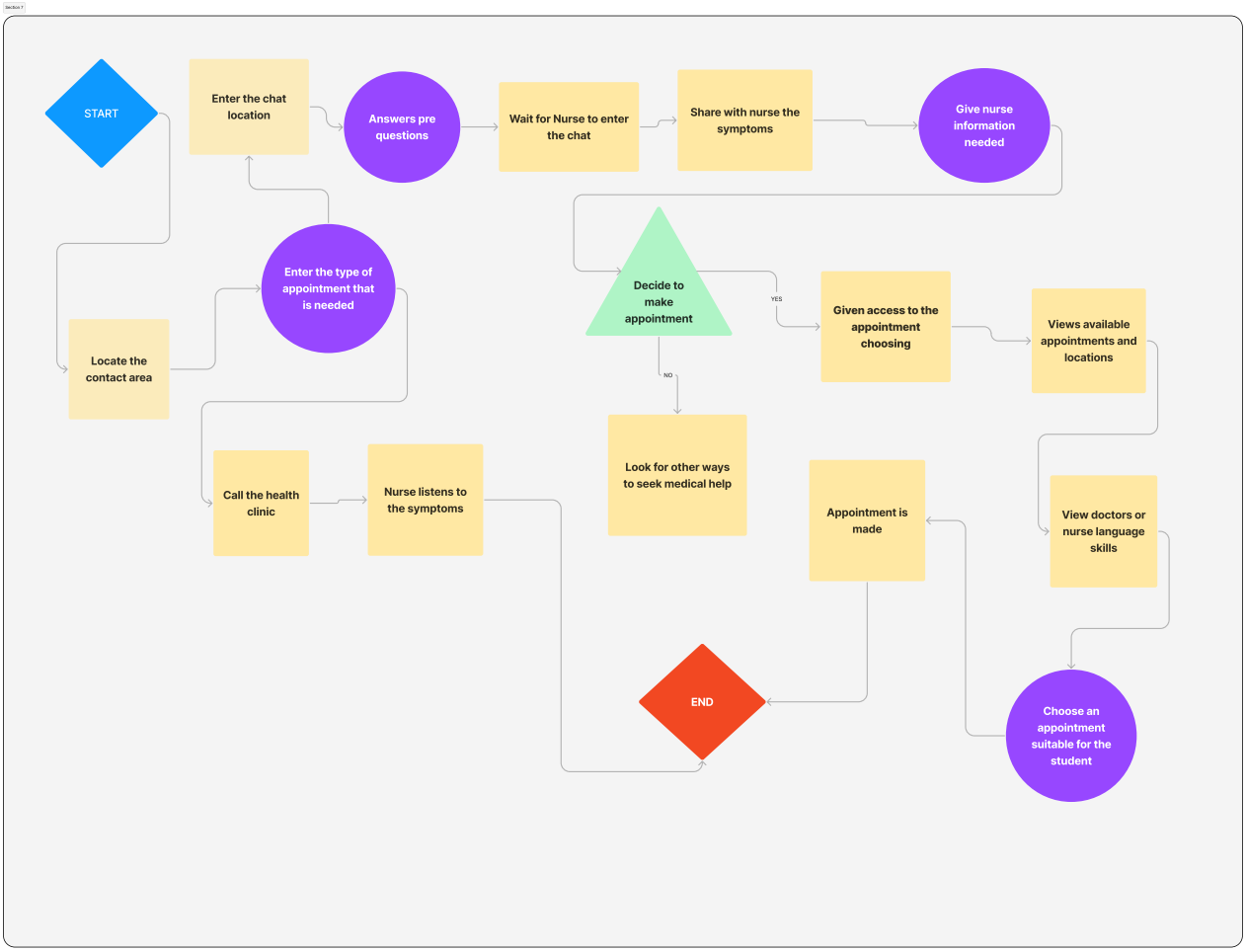



Figure 18: User flow chart 3

In Figure 18, the user flow delineates the process of making appointments via self-chat. Recognizing the previous complexity and challenges voiced by students, this revised flow aims to enhance clarity and usability, ensuring that the appointment scheduling process becomes more intuitive and valuable for users.

## 5.2 Wireframes

Wireframing constitutes a crucial step in the UX design process, offering the project team a straight-forward and time-efficient means of comprehending the product concept, description, and functionality. Providing a clear and easily understandable visual guide, wireframes serve as a re-foundation for subsequent development stages. Designers can leverage wireframes to conduct preliminary usability tests even before entering the prototype phase, contributing to the refinement of the design early in the process. During this thesis project in the design phase there were a handful or wireframes drawn with pen and page. After this was finished, they were then designed within

Figma to represent the wire frame. Figure 20 and 21 shows the wire frame for the landing paper and the portal.

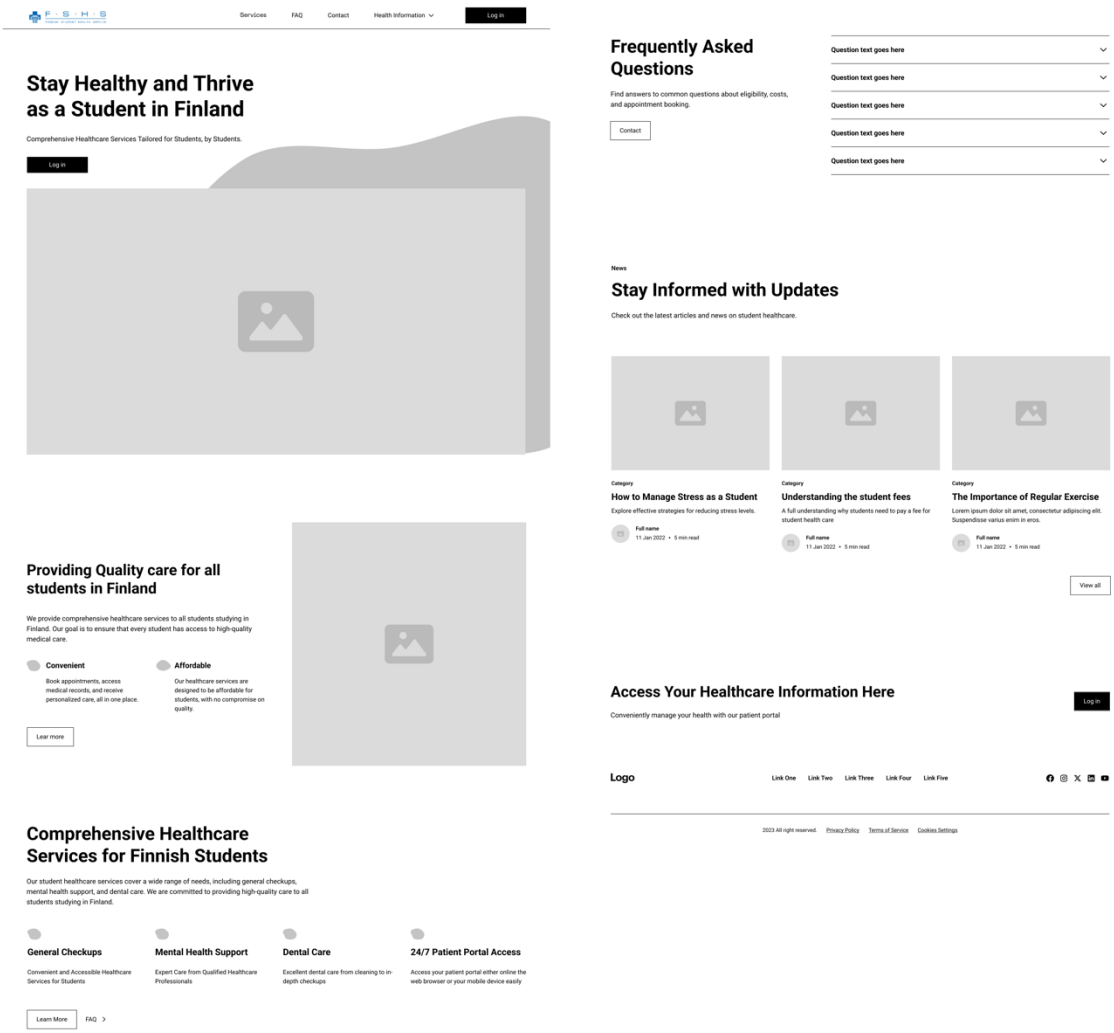



Figure 19: Wire frame of landing page

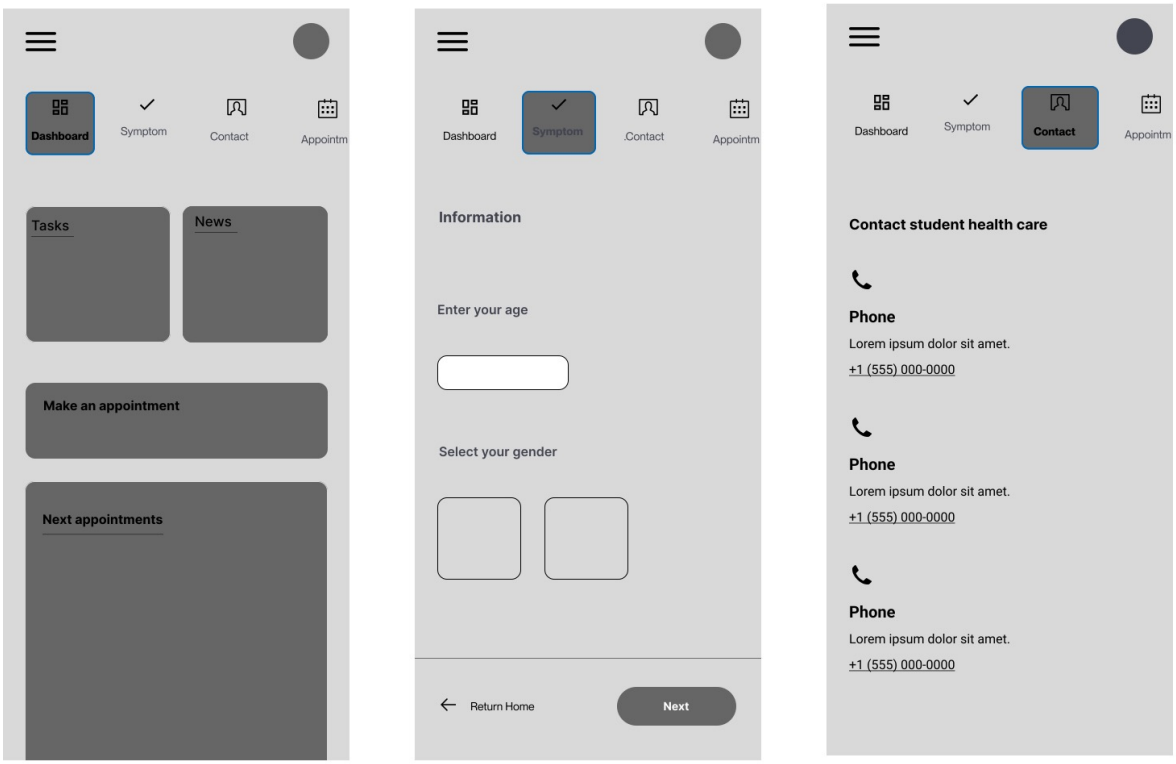



Figure 20: Wire frame of portal in mobile view

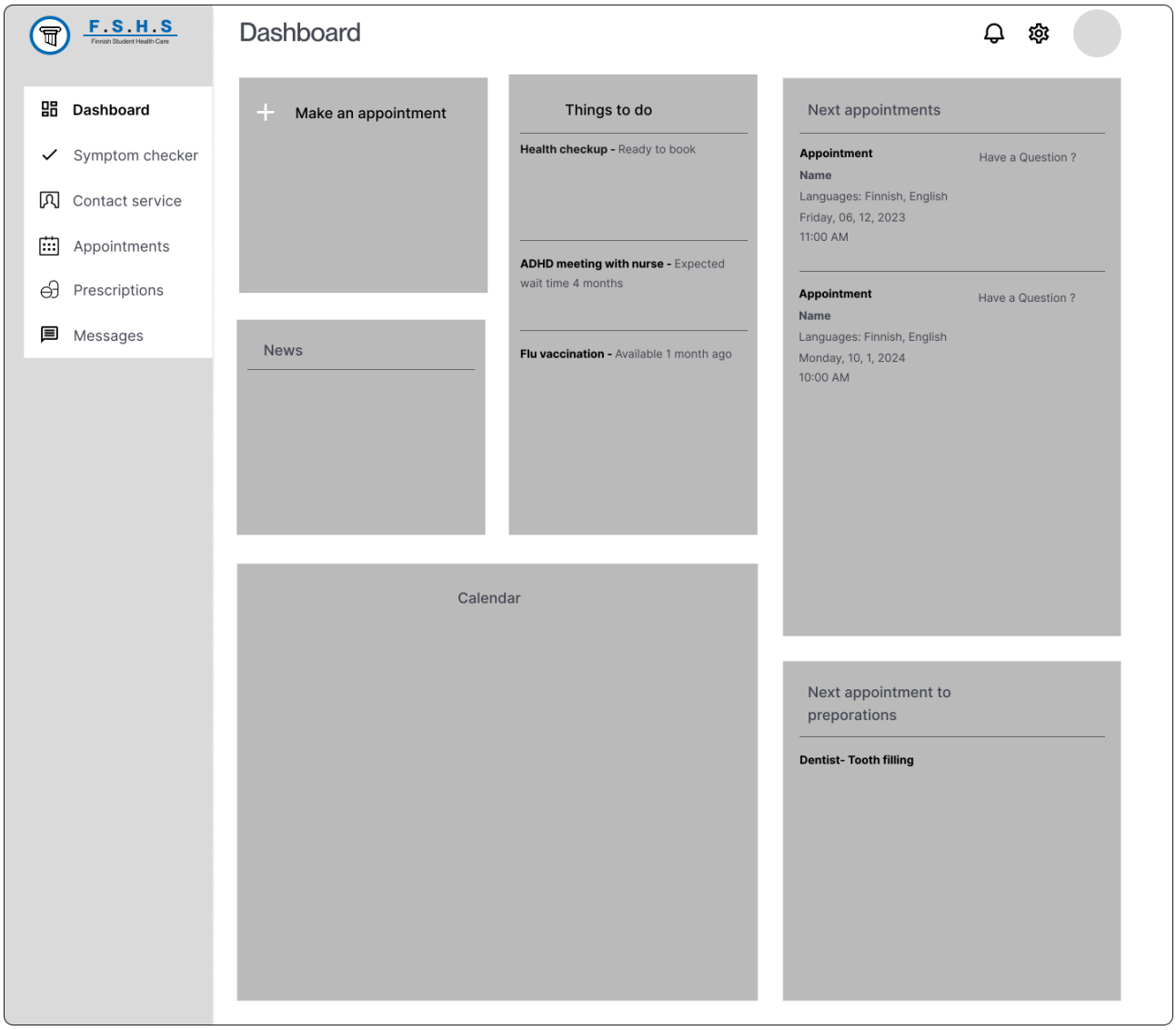


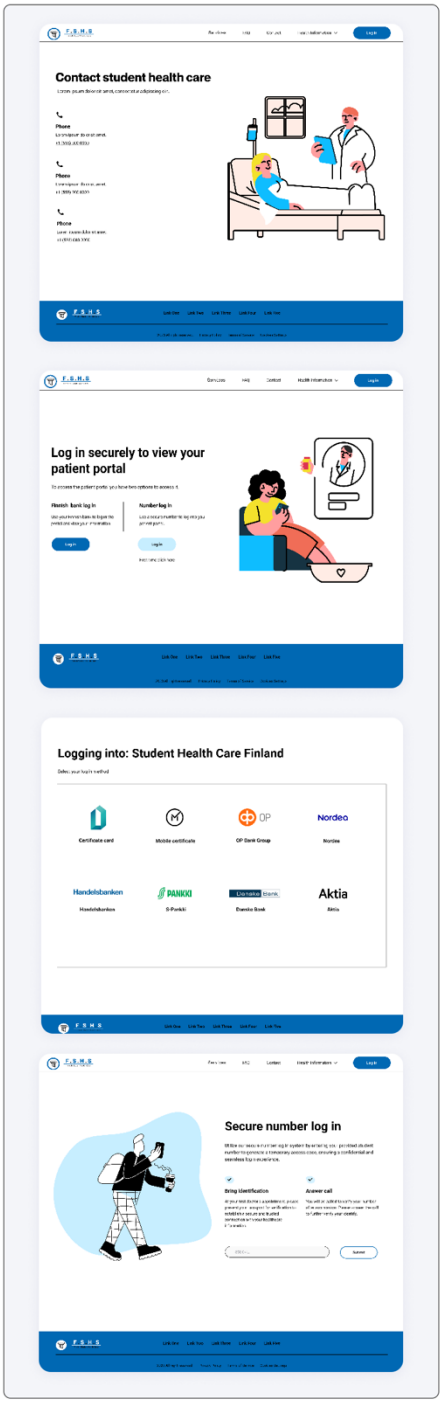

Figure 21: Wire frame of portal in desktop view

## 5.3 Prototype

A prototype serves as a preliminary version of a product or application, providing the development team with a platform to explore ideas and showcase features or design concepts to users. Prototyping methods vary, spanning from low-fidelity to high-fidelity. Low-fidelity (lo-fi) prototypes, created with pen and paper, offer a fast and straightforward approach. In contrast, high-fidelity (hi-fi) prototypes strive to replicate user interfaces as closely as possible, demanding more time and effort to achieve a presentation that closely resembles the final product. A prototype provides a more detailed representation of the product compared to a wireframe. High-fidelity prototypes incorporate interactive elements, enabling users to engage with content and interact directly on the user interface, simulating a real product experience. The high-fidelity prototype employed in this project

was crafted using Figma software. To convey the screens developed for this product, each user flow will be visually presented in the following figures, accompanied by detailed explanations.

The first user flow prototype can be seen in figure 21. In this figure it the prototype is representing the first user flow. The landing page is shown with a clear call to action, which is the log in button. The decision to make two of these two calls to actions is to make it more clear for the student where to click. During the research phase, it became evident that many students bypass the landing page and prefer direct access to the portal. Enhancing the visual clarity of the portal login button serves to facilitate students in moving forward seamlessly, minimizing mental strain, and improving the overall user experience. As well there is a simple and clear contact page. If students don’t want to log in immediately to the portal, they are given the contact numbers right away for them to call to make an appointment. The login process incorporates two methods, and the existing pages for this were identified as potentially confusing. Through refinement and the implementation of UX writing, the pages have been streamlined. The overarching goal is to aid students, especially first-time users, in comprehending both login methods. The primary focus is on maintaining the visual prominence of the main login button as the primary point of interaction.


Contact student health care
Log in securely to view your patient portal
Logging into: Student Health Care Finland
Secure number log in

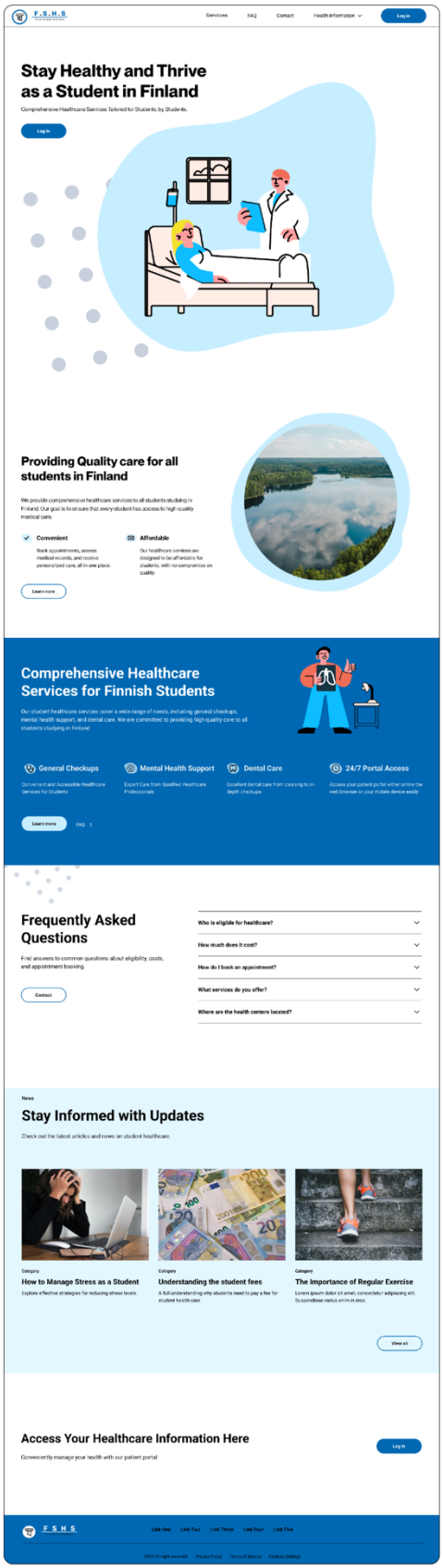

Stay Healthy and Thrive as a Student in Finland
Providing Quality care for all students in Finland
Comprehensive Healthcare Services for Finnish Students
Frequently Asked Questions
Stay Informed with Updates
Access Your Healthcare Information Here

Figure 22: Prototype of user flow 1

The second user flow is illustrated in Figure 22, depicting the process of scheduling an appointment through messaging. In this design choice, emphasis was placed on visually indicating the presence of a wait time and providing an opportunity for students to respond to a set of questions to assist the nurse before initiating the chat. This design not only optimizes the student's time by allowing them to utilize the wait period to complete pre-questions but also showcases the portal. decision within the same figure.

Within the portal are multiple windows in the design style of a bento box UI. This UI has a goal to fit information in an appealing way while making it accessible. There are tabs on the left-hand side to help assist the student in navigating to other relevant parts of the portal. The main portal dashboard gives six different boxes with information for the student. The first is a simple button to make an appointment. This is shown later in the user flow. The second box represents tasks that students need to complete, which may involve paperwork or responding to the nurse or doctor as required. The third element is a news section designed to provide information about health risks or viruses prevalent in Finland. The fourth section is a simple calendar that highlights upcoming appointments and due dates for the student. The fifth element provides a list of upcoming appointments, caregiver information, and an option to message the doctor. This design aims to foster a patient-first relationship by offering convenient access to relevant information and communication channels. The final element furnishes a list to assist the student in preparing for the upcoming appointment. This may include reminders to complete documents or bring specific items, such as a teeth mouth guard, creating a comprehensive and organized approach to appointment readiness.

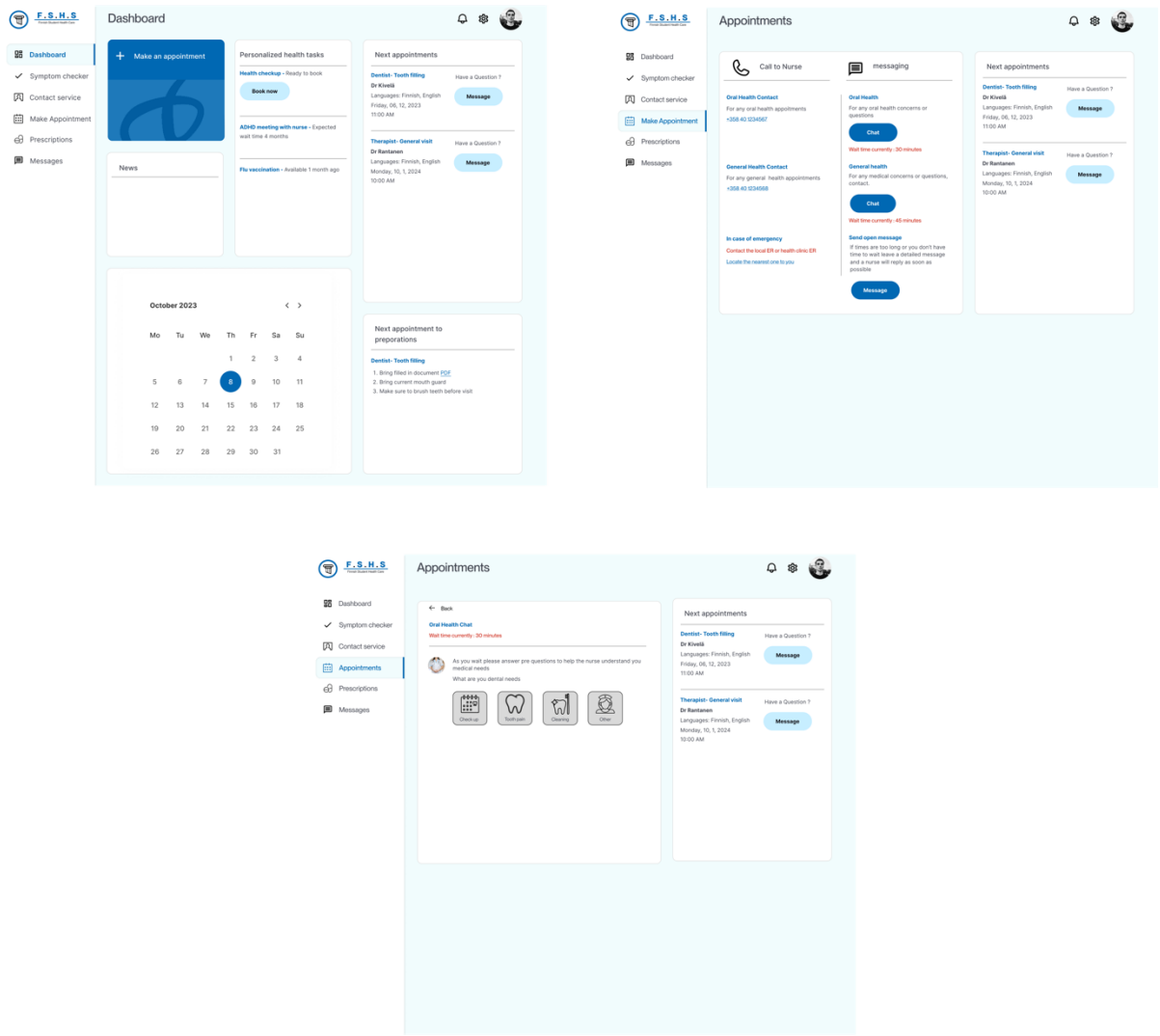



Figure 23: Prototype of user flow 2

The final user flow can be seen in Figures 23 and 24. This section introduces the symptom tracker design. Its goals are to help give students further understanding of whether they should contact healthcare services or not. The objective is not only to guide the user users in comprehending potential health issues but also to equip them with self-assessment tools and homecare suggestions. By providing a user-friendly interface for tracking symptoms, this feature aids students in making informed decisions about their health, contributing to a proactive and engaged approach to healthcare management. The design emphasizes clarity and accessibility, aligning with the broader mission of fostering user autonomy and well-informed health choices. The decision of this element was kept in line with other UI decision decisions. Each page was planned to be simple and without too many questions. This will help the student answer the questions and access it on their mobile devices without the need for large amounts of scrolling.

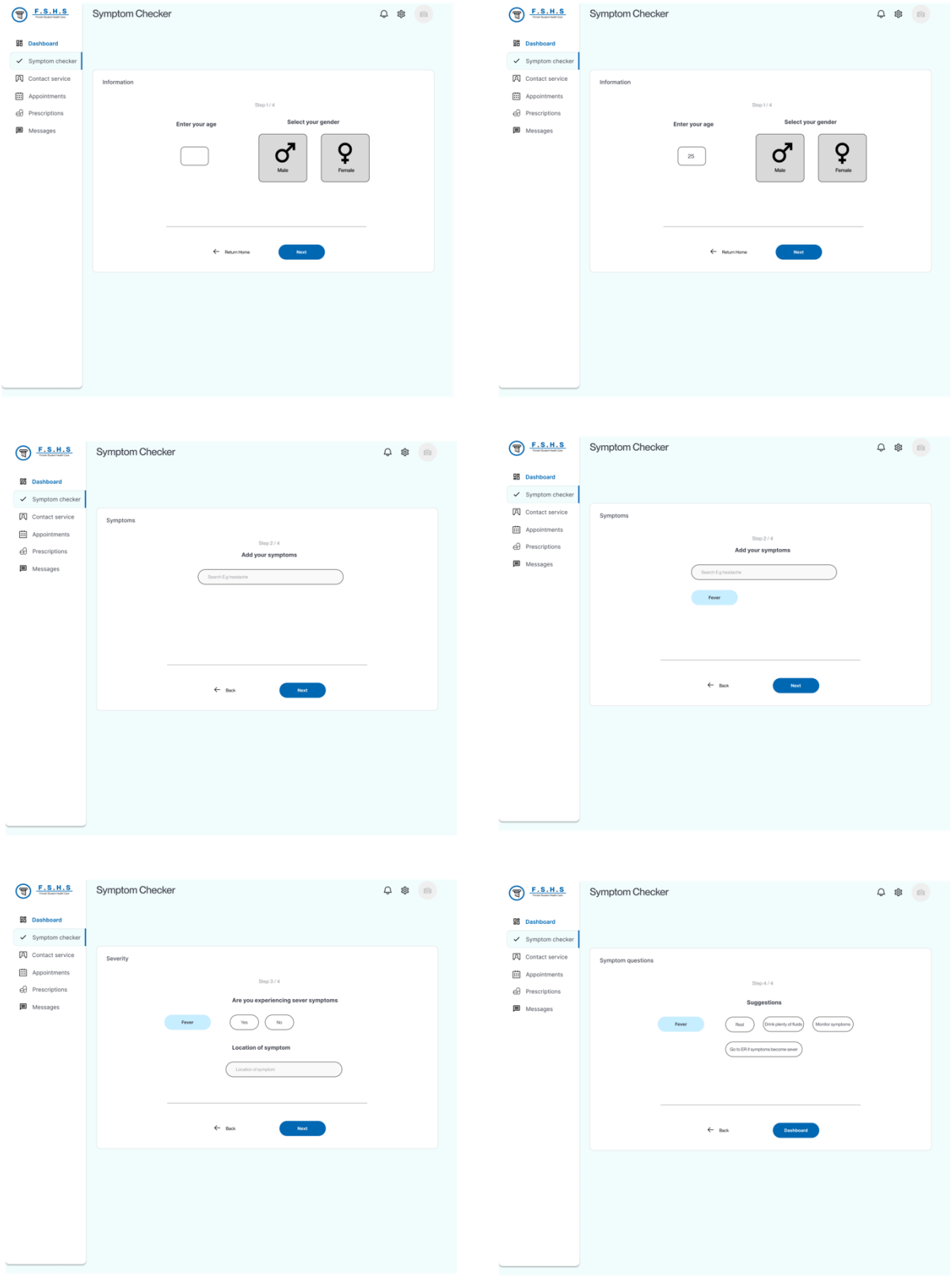



Figure 24: Prototype user flow 3

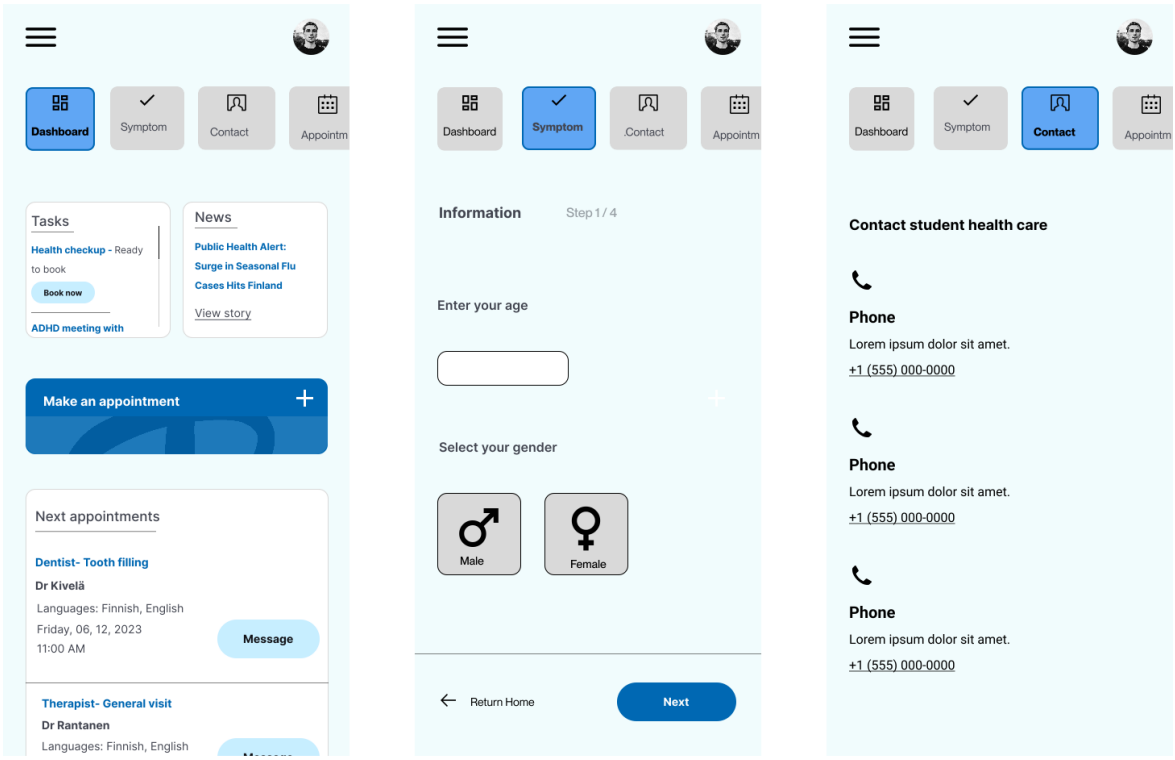



Figure 25: Portal as seen on mobile view

# 6 Testing the prototype

The usability test serves as a crucial evaluation tool for assessing a new feature, a specific application function, or the overall usability of a complete application, website, or mock-up. Establishing clear criteria for evaluation from the outset is important for testing. For this project, a usability test was conducted to evaluate the high-fidelity prototype, aiming to identify areas for improvement and refine features based on user needs and feedback for future enhancements.

Five students were met in person or on video call to test the prototype. Each was given six task to complete within the prototype. The testing was planned for twenty minutes and included a short discussion on the prototype. The author was responsible for recording the data on tables and then organizing the data to be examined. Table 2 is the table of information taken from the usability test. On the top of the table is the task given to each user and under it is the success or failure of the task.

| | Log In and Access Upcoming Appointments | Initiate a Chat for Appointment Booking | Complete a Symptom Tracker Entry | Prepare for an Upcoming Appointment | Check News Section for Health Information |
|---|---|---|---|---|---|
| User 1 | Complete | Complete | Complete | Complete | Said it needed more news |
| User 2 | Complete | Complete | Complete | Complete | Complete |
| User 3 | Complete | Complete | Complete but with trouble | Complete | Complete |
| User 4 | Complete | did not complete note couldn't locate the location | Complete | Complete | Complete |
| User 5 | Complete | completed note asked for help | Complete | Complete | Complete |

Table 2: Usability test results

After the test were conducted, the information was then analyzed to make further decisions on the UI and user flow. The data that had been analyzed and considered after the test was conducted. The key findings from the usability testing have shown the necessity for specific changes to enhance the prototype of the portal site. Firstly, there is a discerned need to augment the content in the news section, making it more visible for users. Secondly, attention is directed towards improving the visibility of the chat section, addressing queries related to locating and launching this feature. These identified areas for enhancement will be addressed, refined, and incorporated into the

final prototype. Additionally, a tester has volunteered to evaluate the ultimate rendition of the prototype upon its completion, providing insights for further refinement. Figure 27 shows the gathered thoughts about the user testing. The goal for the prototype to make these final refinements and conduct one round of testing.

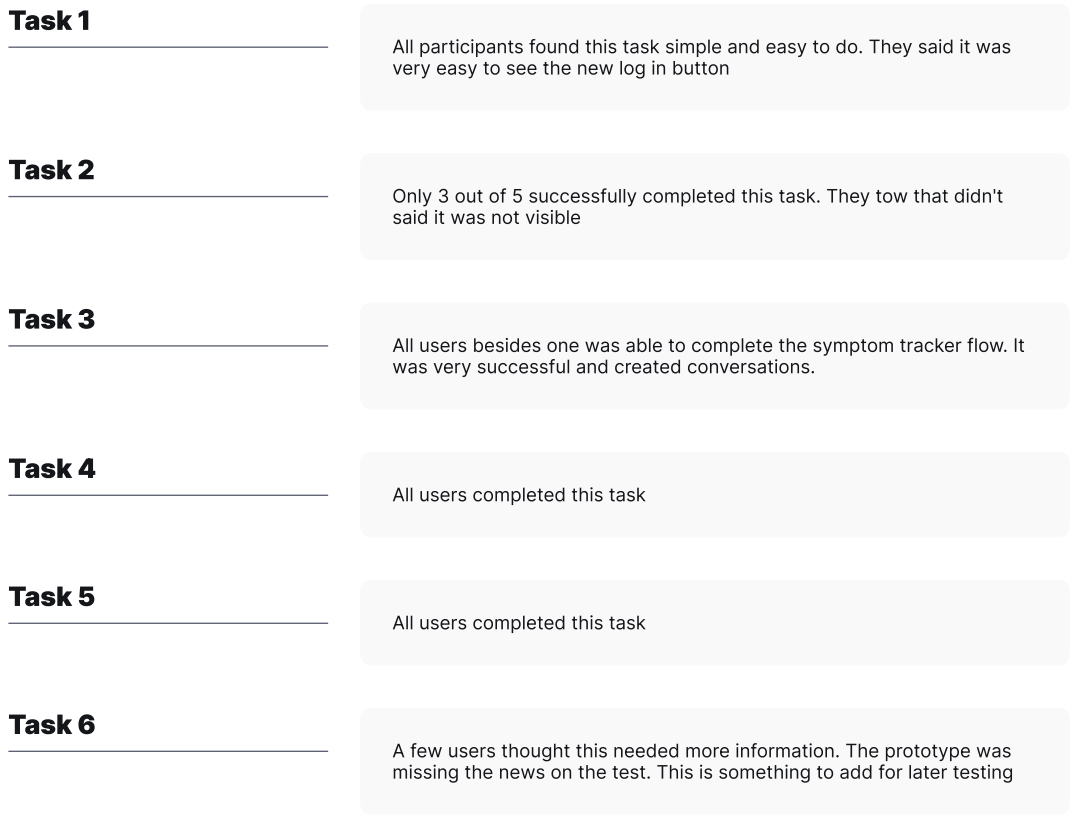



Figure 26: Usability test data

The following changes were made to the prototype. The first change was a wording change for the booking appointment section. This small changes to help assist the user understand that this is the two main ways of booking appointments within the portal. The second change was under the main dashboard, which included changing the news headline section and adding content within it. Also, there was a wording change from just appointments to Make appointment. In the conclusive phase of the usability testing, an industry expert in design provided valuable insights. The expert affirmed that prior issues of confusion had been addressed, resulting in a clear understanding of the appointment booking process.

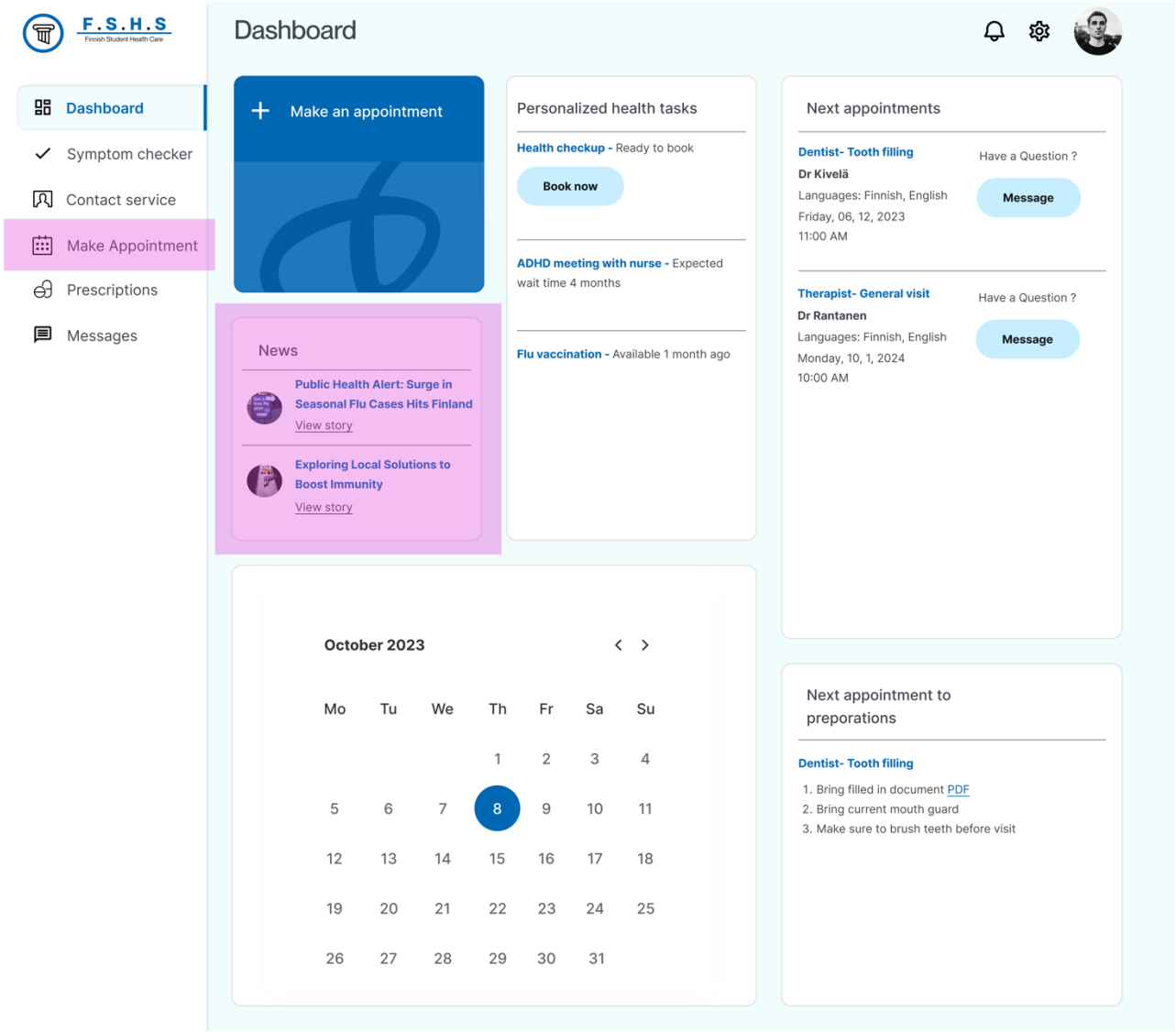



Figure 27: Design refinements 1

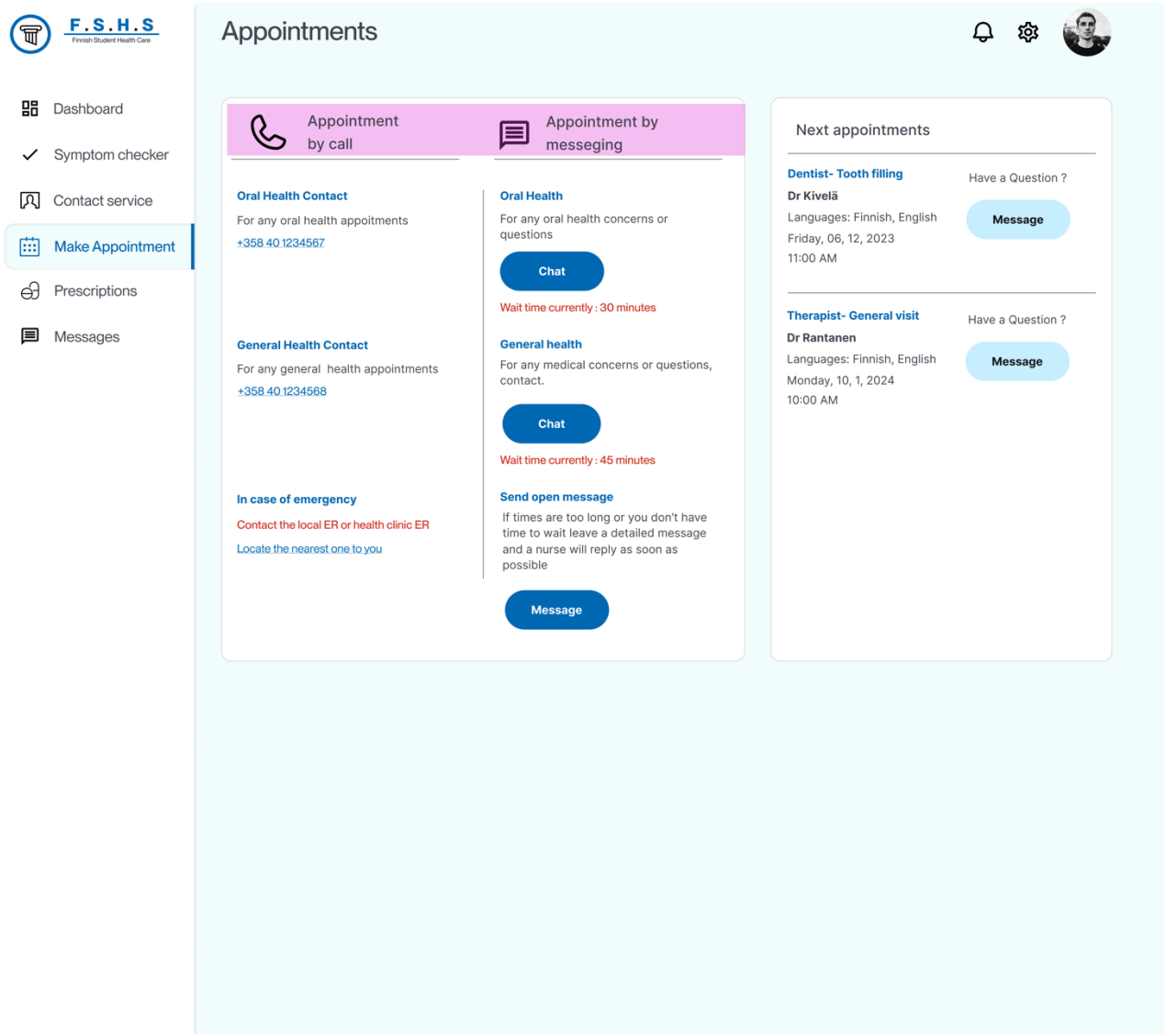



Figure 28: Design refinements 2

# 7 Conclusion and recommendations

As seen in the thesis there is a great need to create products that are focused patient centric. Patient centered care, emphasizing individual needs and preferences, stands as an important measure of quality. Despite the importance of evidence-based practice, the current landscape suggests a lack of superiority among approaches for implementing new treatment initiatives, emphasizing the ongoing need for scientific evaluation in evolving healthcare delivery (Fry  2020). Therefore, there is an ever-growing need for service design thinking within the health care realm.

Patient centric healthcare is very much like the design thinking process. Both aim to keep the user at the center of the program or service. When thinking about patients using digital platforms this brings back the need to create accessible user centered design. This thesis not only highlights the alignment of design thinking and patient-centric thinking but also advocates for the practical implementation of these principles in healthcare design and service delivery.

The cornerstone of design thinking lies in the "Understand" phase, where research and comprehension of the end user take center stage. This thesis strategically applied this principle by deeply exploring the needs and challenges of the end users, specifically students in Finnish universities. Through a combination of thorough interviews and comprehensive surveys, the project garnered insights that were pivotal in defining a focused direction for development.

## 7.1 Other applications for this project

Implementing a patient-centric portal and system, like the one designed for student health care, can be a valuable model for private healthcare institutions. By focusing on simplicity, accessibility, and clear communication, such a system can enhance the patient experience across various healthcare settings. Private healthcare providers can adopt similar principles to streamline their services, providing patients with user-friendly interfaces, transparent appointment information, and comprehensive educational resources.

Also, locations such as the local health clinics could benefit from a system like this as well. After, speaking with professional doctors in the medical field it has become apartment that there are massive communication issues between caregivers and the patients. Using design thinking would be a great starting point to solving some of these patient care problems.

## 7.2 The use of AI bots as a future exploration

Additionally, integrating AI chatbots into the healthcare portal can significantly improve patient understanding. AI chatbots have the potential to offer instant assistance, answering common health-

related queries, providing information on symptoms, and guiding users through preliminary assessments. These chatbots, equipped with natural language processing capabilities, can enhance patient engagement, reduce response times, and contribute to a more efficient and personalized healthcare experience. The use of AI technology aligns with the growing trend of digital transformation in healthcare, offering innovative solutions for patient communication and education.

### 7.3 Recommendation for Student health care portals

First, after learning about the needs of the students via interviews and research. It has been learned that students need a portal that is not only simple a minimalistic, but easy to use. This can be achieved by cleaning up the interface and creating it into one unified portal page. As well help assist both doctors and students by giving them clean information about appointments and what is expected of the student. This can help foster a better patient doctor relationship.

Secondly, the information about symptoms and make its accessible for the student to view should be easier to understand. Additionally, consider implementing features such as an easy to navigate glossary or search function to enhance accessibility and facilitate student learning about various illnesses and symptoms. These additions can further empower students to access relevant information effortlessly and contribute to a more com-prehensive and user-friendly experience.

Finally, the students need clear information about the wait times. This can be done in the interface of the portal. The research has shown that students find this part of the program frustrating. Addressing the frustration expressed by students in the research, this enhancement ensures that students have clear expectations, allowing them to better prepare for potential phone calls or communication from healthcare professionals. This transparent communication contributes to an improved overall experience and patient satisfaction.

### 7.4 The next steps for the development

With the completion of UI design and successful testing, the next steps in implementing this portal involve a strategic rollout plan and continuous refinement. Firstly, a phased deployment approach can be adopted, starting with a pilot program involving a subset of users to gather real-world feedback and identify any unforeseen challenges. Concurrently, a comprehensive training program for both healthcare professionals and users should be developed to ensure smooth onboarding and optimal utilization of the portal's features.

After the initial rollout, an iterative process of improvement based on user feedback and data analytics should be established. Regular updates and enhancements can be introduced to address evolving user needs and technological advancements. Additionally, collaboration with relevant stakeholders, such as healthcare providers, IT specialists, and patient advocacy groups, will be crucial for ongoing success. Continuous monitoring of the portal's performance, user satisfaction, and adherence to healthcare standards will guide further enhancements and ensure the sustained effectiveness of the implemented system.

### 7.5 Personal learning

Working on my thesis, which centered around UX design within the context of a student patient portal, has been an enlightening journey. Through this process, I've delved deep into the essence of understanding the true needs of the user. Beyond simply scratching the surface, I've learned to empathize with users, discerning not only what they say they want, but also what they truly need for a seamless experience.

Moreover, my interactions with students during interviews and testing phases have honed my communication skills significantly. It's one thing to understand user needs theoretically, but another to effectively extract insights through meaningful dialogue. Learning how to communicate well with students, listening attentively to their feedback, and observing their interactions has been invaluable. These experiences have underscored the importance of human-centered design, emphasizing the pivotal role of user engagement throughout the design process.

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