LAB University of Applied Sciences

Design UX/UI for a work schedule application

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Abstract

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Title of the thesis

Design UX/UI for a working schedule application

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Abstract

The thesis is for readers who want to learn about what UX/UI knowledge is, its concepts and processes, and why they are considered quite important, holding a special place in the whole process. Create a company product. The thesis also applies the knowledge of UX and UI to design a product called the working schedule with the sequence of steps in the entire process of designing that product. The reader sees the difference in designing a product with UX/UI application brings quite a lot of benefits over the old traditional method.

Keywords

User Experience (Design), User Interface (Design), User Interface Principles

CONTENTS

1 Introduction

1.1 Background

Applying user design in the major of professions has been done for a while. However, no one could define which clean concept to describe these actions. In 1995, the words “User Experience” appeared by a man called Donald Norman. The value of UX/UI is speeded spread to every place from one country to another country every single day. Moreover, applying UX/UI to the product or service is a good idea to save much time and a vast amount of money by reducing building costs compared to traditional methods. (Canziba 2018, 9.)

The thesis topic, “Design UX/UI for the working scheduling application”, is expected to apply UX/UI knowledge to the working scheduling application. This makes the product more attractive and effective. The scheduling application is a tool that supports users to arrange a working schedule in a company or group, and a leader shares schedules with their staff by methods as the main feature. Besides, they are supported by other exciting functions. In addition, the thesis also demonstrates the entire process of stages to create and form a product through the discovery of user behavior, markets, and competitors, research, and interviews with customers, analytics collected data, and creating business strategies to sketch and design a product that meets most of the needs of customers, and brings a great value at a small cost.

1.2 Motivations and objectives

The author has more than three years experiences of part-time jobs, and the author brainstorms an amazing idea to help managers arrange their working schedule and support them in making use of modern technology in their normal life. The small tasks took most of the time in one working day, and this was their obsession. There are several products that provide a similar service to organize and reduce tasks for managers in the market. However, the experience of using these platforms was not great as expected by some errors or redundant functions and complicated UI. Their targeted consumers are almost medium or large size company, so their display with huge functions could be one of many reasons that make users uncomfortable. With some other small organizations, the simple product could be a fulfilling solution to their need and budget. A technology product saves time and cost.

With IT field knowledge from the academy and online courses, the author and her friend decided to build a wonderful product or service to solve these above problems. It is going to be the first product and the targeted customer’s need.

In the thesis, focus completely on UX/UI design knowledge and applies them to the product. Following the UX design process, it could get an overview to understand the customer and market, competitors, and what the targeted customer needs. Then, in the next stage, the UI design process be more smoothly within a fulfilled goal.

1.3 Delimitations

There are some limitations in the scope of research and focus only on a few key steps to design the product.

First, the primary focus of this thesis is on the scope of the survey to collect construction information for the design, as well as the study of ideas to improve the design only conducted in small and medium-sized organizations in Helsinki, with the number of interviewers ranging from 10 to 15 people.

Second, the limitation refers to the process of implementing the design. To be able to dive into each stage in the process takes much time to complete accurately and analyze thoroughly, so the thesis focuses only on the steps that focus on the design.

Emphasizing understanding the customer's problem and finding solutions to improve the difficulty of the client's daily work, a thesis does not focus on writing as a business presentation of a business. Therefore, the thesis is completed only in the design stage, not the product.

The thesis has two surveys, including a user behavior survey and a design improvement survey. The improvement survey is only done once, instead of multiple times, as in the actual process.

As a motivations and objectives field, the thesis is an opportunity to discover UX/UI field and its benefits, then design UX/UI for the working schedule. However, building the idea into a reality product requires much time for user research methods such as user interviews, diary study, testing, etc. Therefore, the limitation of the thesis only concerned the design of UX/UI for the application. Besides, UX research is conducted around Helsinki instead of other cities in Finland.

1.4 Research questions

There is the main research question which makes the thesis more comprehensible, and it could get an overview of user behaviors and the shape of the future product:

How to arrange the shifts in working schedule at the workplace?

There are sub questions:

- What application/platform is used to solve the daily task?
- Does the current application/platform help to solve problem?
- Which functions solve the task?
- What normal problems during working day?

1.5 Research methodology & Data collection methods

1.5.1 UX research

In the UX research phase, any successful products or services could not ignore this stage. This step is to understand the product first, then observe user behaviors, the competitor's and customer's needs, and their motivation for using the platform. (Travis & Hodgson 2019, 18.)

Research is an important part of the whole process, it could prevent builders from designing wrong products and mistakes version, and it saves the company and their clients valuable time and money.

1.5.2 Quantitative research

Quantitative research collects and analyzes numerical data and uses numbers to represent aspects of user experience. One of the critical features of this type of research is that the results can be described numerically. After a thorough understanding of these numbers, it is possible to predict the future of the product or service and make changes accordingly. This method allows for broader research involving a wider audience and increases the ability to generalize results, increasing the objectivity and accuracy of results. Quantitative methods are said to take an objective approach to research problems. The use of this research in design is to compare designs and statistics through numbers to make the right decision. Quantitative methods are famous for using research, such as A/B testing, survey, and analytics. (Moran 2018.)

In general, quantitative methods are designed to provide summaries of data about the phenomenon under study, which are then analyzed and compared with similar studies. Quantitative methods are supposed to take an objective approach to the study of research problems, in which data are controlled and measured to solve the accumulation of events and identify the causes of behavior. However, some specific limitations associated with using quantitative methods to research problems in the social sciences include miss contextual

details. The development of standard questions by researchers can lead to "structural bias" and misrepresentation, in which the data reflect the views of the researcher rather than the participants. The results are limited because they provide numerical descriptions rather than detailed narratives and generally provide less complexity of human cognition. (Bhandari 2022.)

In this study case, quantitative research reveals an indirect of the usability based on user's performance like their satisfaction with the product. However, the thesis concerns the design of the product instead of the complete platform.

1.5.3 Qualitative research

Qualitative research is to gather insights or observations of users, products, or services without statistics. Qualitative research collects information and analyzes non-digital data such as audio, recordings, and interviews. This research is often used for new concepts and ideas or to conduct research on the experience of product users. Qualitative research is a study that provides a natural experience when collecting data, it seems to honestly and in detail describe the experiences, opinions, and feelings of the interviewees, and that helps a lot in designing, testing, or improving product systems services. In addition, qualitative research helps to expand open-ended questions, not limited to a single topic, which helps researchers get new information to study and prevent unwanted problems from occurring. However, qualitative research also has its limitations because, as a non-numerical study, the accuracy of the research paper is not appreciated because it contains quite a lot of objective opinions from a few small parts, and the results are not really as expected in the real world. Therefore, the use of qualitative research needs to be considered and customized on a case-by-case basis so that the results they bring are highly effective. (Saldana 2011, 3.)

There are several common qualitative research methods used to collect data: observation, interview, focus group, and survey.

- Observation: recording what is seen, listened to, and experienced to accurately and in detail convey the feelings, opinions, and feelings of study participants.
- Interviews: are conversations between the interviewer and the participant in that interview. The series of questions are answered through opinions and feelings.
- Focus groups: asking questions and creating discussions among multiple people in a group of people.

- Surveys: asking a series of open-ended questions related to the topic being studied, then the survey is asked directly or indirectly to collect data.

It depends on the current stage in the whole process, and researchers should use an appropriate approach for their phase. In this study case, applying qualitative research for the thesis topic by its benefits before designing the working schedule, which is one of many popular attractive supported services in Finland and internationally as well, focusing mainly on user behaviors and their needs, their pains as priority target through the diary study, direct user interviews. Asking participants prepared questions makes a better understanding. Then, based on UX/UI knowledge and observing users' experiences, researchers determined whether UI interactions work well or poorly. Therefore, this redesign stage is applied by qualitative research to collect worthwhile data and information from future customers.

1.5.4 Data collection methods

With qualitative research, there are a variety of different data collection methodological approaches, including in-depth structured or unstructured interviews consisting of group discussions, interviews, participant or nonparticipant observational studies, reports, diaries, reports, letters, films, or videos. Other data collection theoretical approaches involve symbolic interactionism, ethnomethodology, etc. (Bowling & Ebrahim 2005, 215.)

In this thesis, data and results of interviews are collected directly through research interviews, observations, or experiments from future targeted customers. The author has planned a period to discover and plan about targeted consumers and their behavior. Then, the author created a list of crucial questions that directly pointed to the primary goal of business. The online survey is conducted with questionnaires shown individually in Google Forms to collect helpful information for the design process.

The main research question is how managers or owners can arrange daily working shifts. The author would like to use other sub-questions to get an understandable response and clarify many wonders during the redesign process.

1.6 Thesis structure

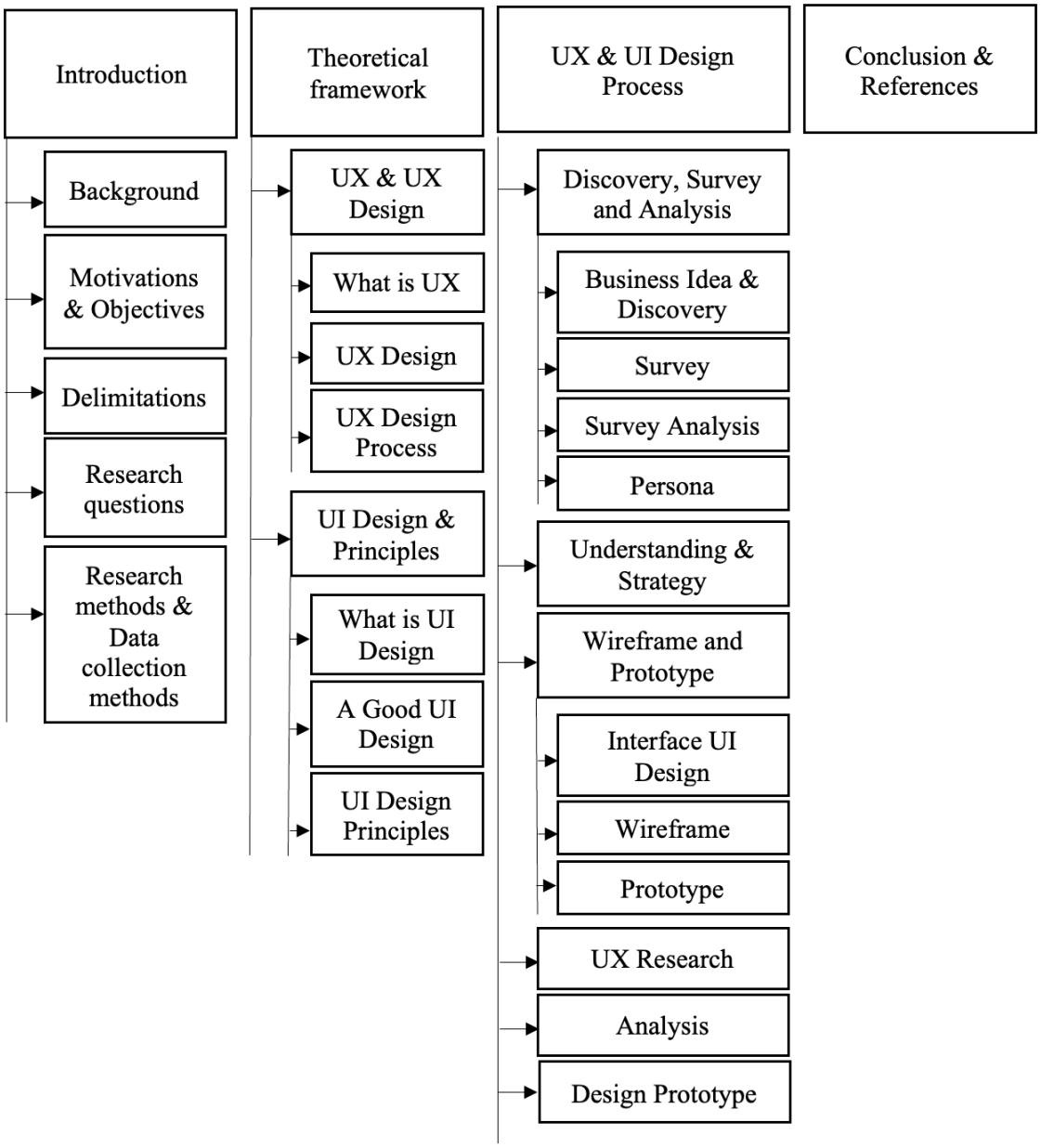

Figure 1. Thesis Structure

The topic thesis is the Design of UX/UI for the working schedule. There are five elements seen in Figure 1: Introduction, Theoretical framework, UX & UI Design Process, Conclusion, and References.

The introduction is an opening chapter for leading the reader into understanding a problem. It is a place to give an overview of the thesis's background, a general overview. Reading the introduction and conclusion before entering the world of thesis writing. Next, the author states the purpose and motivation for creating the thesis and what reasons and purposes the author brings to society through the research topic. And in the thesis, the author has raised the importance of UX/UI for today's era and the motivation to make design a working schedule application from her previous work experience. The job's difficulty has motivated to create a product that helps the management profession and contributes to social development. However, the author indicates where the scope of the article is and whether there are geographical limitations. The only one market, Helsinki, instead of the whole country of Finland or another geographical region.

The research section is included research questions and data collection methods. The research question explores and raises a central question and clarifies the main question, which is related to sub-questions. Spending time to find out the topic and what kind of methods are applied that bring optimal results.

Based on the research methods, the author continues looking for how and what plans to collect the data, listing and clarifying in the corresponding section.

The second part is the knowledge part of the thesis, allowing knowledge through reputable sources and reporting it from the author's point of view. In this thesis, the author wants to delve into the two main concepts of UX and UI, which are the focus of this entire design process. Before proceeding to the product design process, it must have an academic view of them and how useful their value is created and brought.

UX Design and UI Design Processes are essential processes in the implementation section. They are the result of practice after instilling knowledge of UX and UI design, and they are also the finished product after applying helpful knowledge.

Finally, the thesis presents the sources that have been used for research in a predefined format, where the evidence of the author's arguments is authoritative and worthy.

2 Theoretical framework

2.1 UX & UX Design Process

2.1.1 What is UX?

UX stands for User Experience, the term UX was coined by Don Norman, who was the first person to create the name for this field (Norman 2016.). UX is also a method to define how the products or services work, as well as their functions and features that could be attractive to users or products' ability, could satisfy users' needs and tasks.

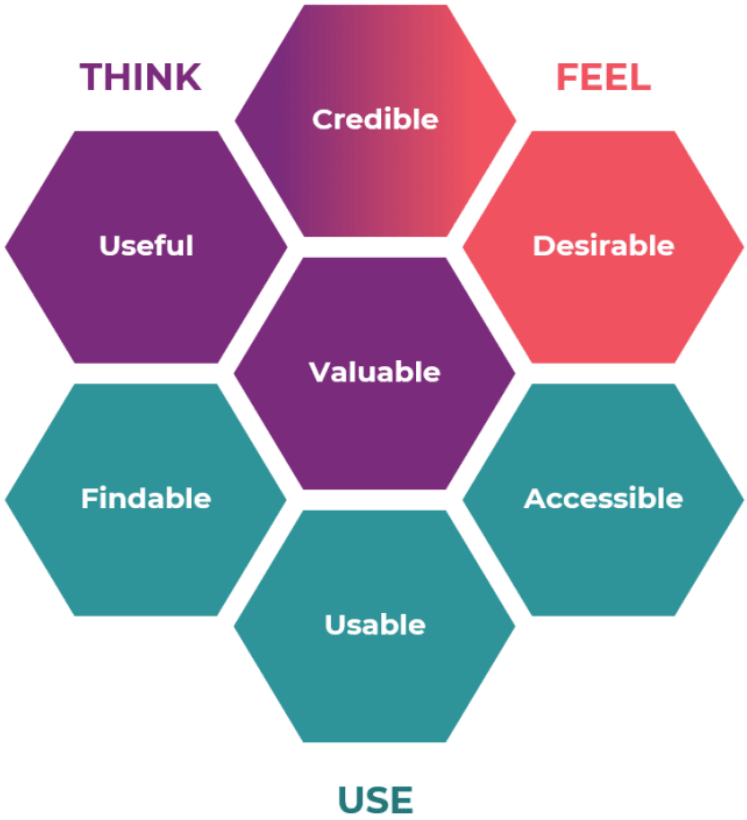

Figure 1. The User Experience Honeycomb. (Morville 2004.)

To be obvious the term UX, Peter Morville created the Honeycomb, figure 2, to reveal clearly that UX is not only to show a usability feature of the specific product or service. UX is to describe their feelings and thoughts after interacting with the user interface, the platform brings worth value to the customer, and it is as their expectation. According to Westley

Knight in UX for Developer (2019, 6), the Honeycomb is provident for his clients that a usability benefit is a small part of the whole UX process. A vast number of people keep a belief that designing and building a usability product means good UX, but in fact, this is not a true story. Each word presents an element of UX.

- Credible: Creating a product or service that brings reliability to customers. Then, consumers can trust the product, and customer loyalty increases.
- Desirable: The product must be visually appealing and emotionally engaging.
- Accessible: Creating a product or service is not enough. It must be an item anyone can access and use, including people with physical and mental disabilities.
- Usable: Regarding this keyword, the association is towards bringing a user-friendly product or service. This factor dramatically impacts the interface design department, making the consumer feel familiar and easily accessible.
- Findable: Customer issues are quickly resolved when using the product or service.
- Useful: A product or service is created to generate consumer benefits. Its usefulness is the primary goal of solving the problems that customers are facing. If a product or service does not have a practical function, it does not exist for a long time, and consumer demand gradually disappear.
- Valuable: A product or service's critical value is to bring consumers matter. Besides the other factors it offers, its value is still considered when choosing the product or service.

2.1.2 UX Design

The "design" aspect of UX focuses on improving the utility, ease of use, and efficiency of user interaction with a product or service.

UX Design is a series of activities to determine what customers need, their pains, or toughs, then find the best method to reduce their heavy tasks in life and work. The most effective ways are always to create attractive, captivating, inspiring solutions. Moreover, customers can comfortably perform their actions toward the product without barriers. They can shop and cancel their orders anytime (Scarano 2021.). UX Design is a process that supports designers to discover and analyze, understanding user behavior, market, competitors, and especially insights into the product's strategy and design the relationship interaction between users and products, including its customer service right through to the quality of its products, applications, or operating systems. With a huge of its advantages, the author

would like to summarize the head of aims that consists of two primary points: UX Design is to understand the essential requirements of potential consumers, and applying UX Design knowledge is to engage users in products, services, or applications as business's strategy.

The result of UX Design must always be measurable through the number of statistics describing user behavior. UX designers use knowledge and methods from psychology, anthropology, sociology, computer science, graphic design, industrial design, and cognitive science. UX design work can include, for example, studying user behavior, building wireframe models of web structures, and finding better ways to deliver information via text, image, video, or other means. One way to learn about the users' needs and preferences is to perform user research. Based on user research, UX designers aim to get a deep understanding of the users. They discovered their problem and tried to kill the burden using design methods, conducting user tests, and iterating the best solution. (Treder 2013, 19.)

According to The UX book: Agile UX Design for a Quality User Experience (Hartson & Pyla 2018, 7.), UXD plays a primary role in business. It has become a crucial mission for a company in many industries, every enterprise size. A good UXD prevents risks, including cost and time.

2.1.3 UX Design Process

The UX Design process consists of many sub-processes, starting with the research process, developing strategy, and improving the process to satisfy the customer. There are totally six stages in a whole UX design processgoal to satisfy customer.There are totally 6 stages in a whole UX design process is seen in figure 3.

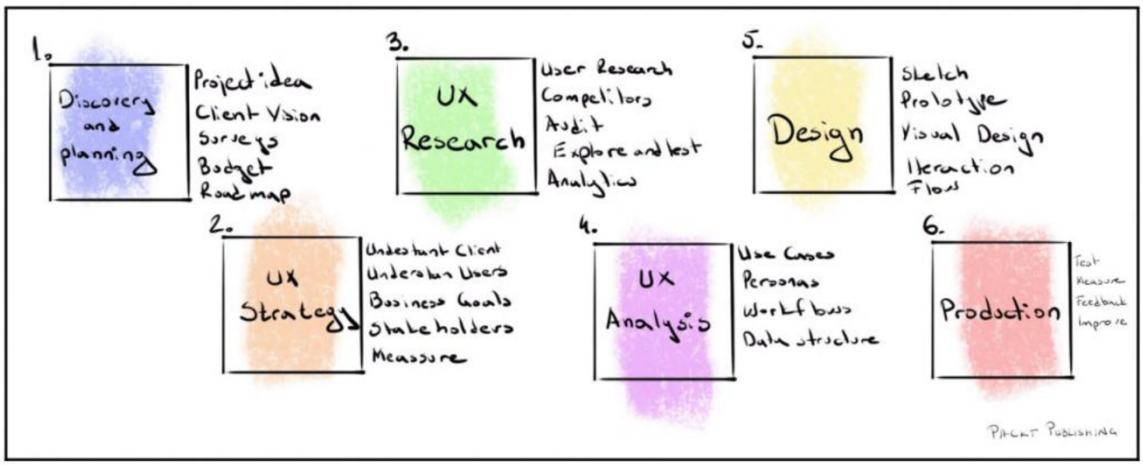

Figure 2. UX Design Process. (Canziba 2018, 23.)

- Discovery & Planning: The first step of a process is to prioritize understanding and planning. First, the team must understand what they create, how it solves current customer problems, and the product's value. Next stage, there are customers, the market, and competitors that address the following factors to be approached to get the most comprehensive and realistic perspective. After collecting the necessary related data, it is time for the team to discuss and clarify the documentation of a project through questions. (Canziba 2018, 24 – 25.)

- UX Strategy: This is a plan aimed at understanding whether the product's user experience truly aligns with the business goals. From there, combining the data collected from the previous step and the business goals create a record detailing how the design team achieve their targets. (Canziba 2018, 29 – 34.)

- Research: This is a stage that is considered essential for a company's finances because of the high benefits it brings. The company can save resources and budget through reliable information without repeating the design process, which is the most time-consuming and costly. In addition, through interviews and research, the authorcan quickly identify user-appropriate requirements, the correct problems, and the right time to solve them. (Canziba 2018, 37.)

- Analysis: To design a project ideally using previous data, the analysis step is a significant effort and time-consuming process to clarify all the issues. This step helps the design team clearly understand measuring the interaction and customer access with the product interface. From there, the design team have many ideas to improve their product to attract and retain customers. (Canziba 2018, 51 – 54.)

- Design: This is the product design stage in the product development process. The author uses information from the analysis stage to create rough designs, prototypes, or sketches. Then, they work to improve and refine the product to achieve business goals and meet customer requirements. It is essential to have a consensus on ideas and sketches between departments in the company to ensure that the product is designed and developed in the right direction and avoid conflicts later on. (Canziba 2018, 55.)

- Production: This can be considered as the final step of a first project, where the product launch is the result of all the effort put into collecting, searching, analyzing, and researching. At this stage, the product is delivered to the customers for them to communicate, work, and use it after rigorous testing. However, the design team still has

to collect more data to continue improving the product and provide the best service to the customers. (Canziba 2018, 65 – 66.)

2.2 UI Design & Principles

2.2.1 What is UI Design?

UI Design, or User Interface Design, refers to the design of everything users can interact with using digital platforms. It intends to influence customers' perceptions and behaviors. UI Design encompasses a product's appearance and function, including the screen, touchscreen, mouse, keyboard, sounds, and even lights. Moreover, it includes everything users can interact with, such as the digital interface. UI Design is critical in determining whether users stay or leave a platform. Today, UI Design can be applied to various media, including computer interfaces, mobile devices, virtual reality, and invisible interfaces. Ultimately, UI Design is a means of providing users with a tool for connecting with a computer and its software in a way that they can see, hear, talk to, and understand. (Scanaro 2021.)

2.2.2 A Good UI Design

A concept that is difficult to distinguish is what constitutes good UI design, which depends on many factors, and the designer must indeed be someone who can grasp how a new user perceives and approaches a new product. According The Essential Guide to User Interface, the book's author points out that attractive design is essential to users, the first impression is good, and then their return to use the product also becomes one of the critical factors. Many service products are provided on multiple platforms, such as computers, tablets, or smartphones. Depending on the type of device, there is a different corresponding design so that one's composition meets customers' needs. In addition, UI is the means through which it presents tools that help users perform their tasks in a simple, understandable, and incredibly effective way during use, and the value of the product is appreciated. If a product's user interface is confusing and ineffective, the product makes more mistakes, customers' loyalty is lost, and it is tough to convince them to return. Therefore, to create an exemplary user interface for a product, a simple interface and layout with a purpose are not just the main points. However, designers should also follow user interface design principles. (Galitz 2007, 4.)

2.2.3 UI Design Principles

With the essential goal of “the good quality product”, investors are very concerned about some primary factors that create high efficiency, drive engagement, and increase usability through researching user behaviors. As designer position, they never overlook the UI design principles. There are five basic common principles:

- Consistency: it takes planning and preparation, an intentional approach to design. Designers choose a color palette, complementary fonts, or tone before creating a brand. Consistency ensures that every part of a design looks, feels, and operates as it should, and the invisible thread ties a successful design together. (Cheung 2022.)
- Contrast: Creating a notice between two visually distinct elements to generate visual interest and highlight important information or actions. (Gordon 2021.)
- Color: It can highlight preliminary information to create a good visual hierarchy. It plays an essential role in UI design.
- Typograph: The interface looks more professional and stylish. Typography is a crucial aspect of UI design that can significantly impact an interface's usability and visual appeal
- Space: Use appropriate spacing around typography to improve legibility and create a sense of breathing room in the interface.

2.3 Why User Experience matter?

Several reasons and factors highlight the benefits of UX and why UX is so important in most companies today:

- Business Success: A positive UX can lead to increased user satisfaction, leading to increased sales, customer loyalty, and overall business success.
- User satisfaction: A good UX can improve the user's satisfaction with the product or service, making it more likely that they continue to use it and recommend it to others.
- Usability: A well-designed UX can make a product or service easier to use and navigate, reducing frustration and errors.
- Brand image: A positive UX can help enhance a company's brand image and reputation, as users are more likely to have a favorable impression of a company that provides a good user experience.

- Competitive advantage: A good UX can differentiate a company from its competitors. Users are likelier to choose a product or service that is easier to use and provides a better overall experience.
- Cost savings: Investing in UX design upfront can help to reduce the cost of development and maintenance in the long term, as it can help to identify and address usability issues early in the design process.

From the above stages, when the product is launched to users, the revenue increases rapidly because users love to experience the product.

Because there are many different stages of designing, researching, and interviewing users to create the perfect product, the product design stage has helped businesses save much money in cost and time (Sebastian 2017).

In the end, a business that invests and takes the time to research UX first ensure to bring a product with the most attention to the hands of consumers, leading to a product that is completely capable of satisfying consumer.

3 UX, UI Design Process

3.1 Discovery, Survey and Analysis

3.1.1 Business Idea and Discovery

Based on the theory presented above, a product's entire UX design process is clearly presented through each step. However, depending on each situation and business product of the company, there is a comprehensive diagram of the design process through the corresponding steps according to the needs and expectations of businesspeople.

First, the thesis project is a product based on the business idea of the author of the thesis article and a teammate. The goal is to create a product to bring utility to users and solves complex problems in their daily working lives. It is different from the business situations of other design products, for example, for other cases, such as a design team being asked by a customer to order and follow the client's wishes as a service business. The author has a business idea, then learning and researching who customers are and how to design products to satisfy their needs. The business idea is to create a support tool for the department responsible for arranging the shifts of all employees in a small group organization (less than or equal to about 20 employees in an organization) with key essential functions such as:

- Present a weekly work schedule.
- Collect employees' free-time hours.
- Summarize and compare each employee's expected and actual working hours to consistently calculate the hours worked for the most accurate employees.
- Present the status of employees' daily shifts on the page.
- All members receive email notifications about the published schedule after each change.

The tool is a product for both employees and managers with two different interfaces to meet the needs of each department and position.

This part of the research first to grasp the business idea of the product that can survive in the market. The most necessary is to find out who the users and future customers of the company are and what business ideas bring solutions to them, besides how the product is shaped in the market. Next, learning about competitors and their business ideas through

the products and advantages they bring to users, thereby building a story about the product that is differentiated and attracts customers when compared to competitors.

At this first stage, a questionnaire is created with some basic questions to be used to investigate what challenges management in each small group organization, how they address them, and whether the current tools they use are responsive in their day-to-day work. At this stage, the author goes to each of the small group organizations operating in Helsinki to survey them.

During the research process, the author interviewed managers in small and medium-sized work areas who shared the difficulties and hardships they often encountered. The author was also provided with some comments on the current support tool they are using. Next, customers provided information about competitors.

3.1.2 Survey

The survey, with a total of fewer than ten questions, was divided into three specific sections:

- Part one: An overview of the agency and its work area. These are questions about the size of an organization and the number of employees in their work area, and ultimately what their product service lines are. A brief overview of the surveyor's agency and organization brings back the company's audience and customers that the product should target.
- Part two: Whether they have difficulty managing work, especially arranging shifts, and coordinating employees to work during each shift. Although this is a question, it is enough to confirm whether the customers are struggling or feel quite okay with the current tool and do not need support, which is also a way to reach out to future customers.
- Part three: Questions related to their day-to-day work with a focus they want to explore the main problems that managers and their employees face frequently. The needs and desires of managers, as well as members of the organization, expect. The main goal of these questions is to understand what happens to the customer and what they want to do to satisfy the task, and from there, the company has a broad table of the target audience and the product's main functionality.

3.1.3 Survey Analysis

After the survey, the author obtained a good amount of data and answers from the client to develop a preliminary analysis before embarking on the critical stage of internal design. This analysis focuses on three weaknesses: users, markets, and competitors.

User

For the first part of the survey, the author wants to learn about external information that helps identify prospective clients by getting a general understanding of their company size and the number of total employees in a work area.

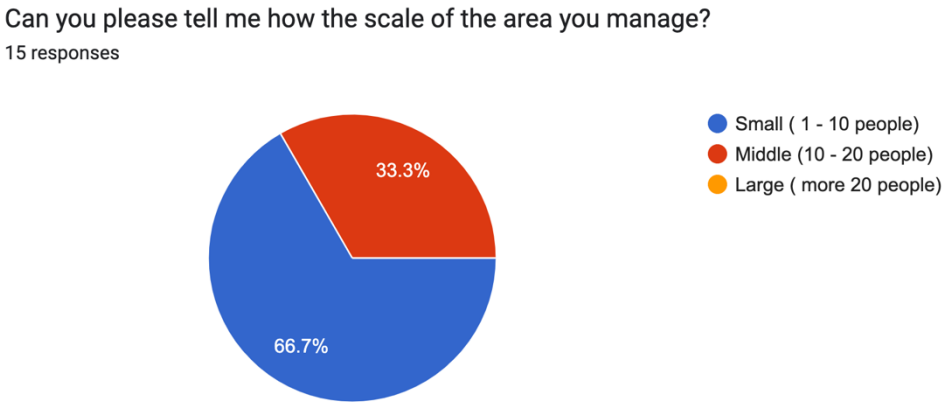

Figure 4. Company size survey chart. (Appendix 1.)

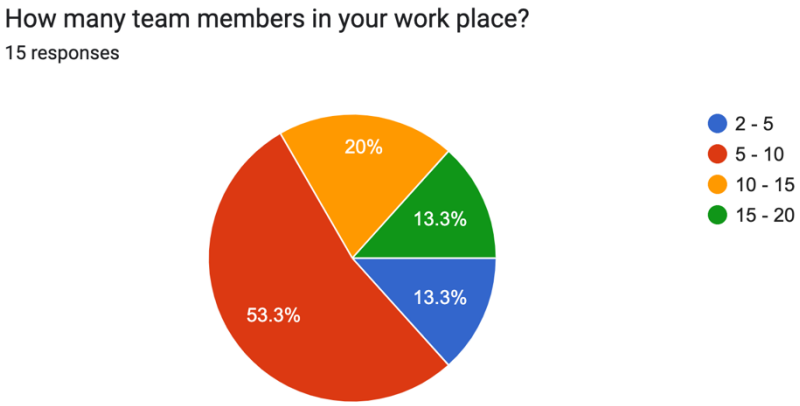

Figure 5. Chart of the number of members in an organization. (Appendix 1.)

These are two general illustrations of the company size of those surveyed. The chart shows that most of the respondents are those working in small companies accounting for 66.7% and medium 33.3% (Figure 4). For small companies ranging from 5 to 10 people, accounting for 53.3% (Figure 5) and the number of employees less than five people in a management area, accounting for 13.3%. For medium-sized, the staff of 10 to 15 people accounts for 20%, and from 15 to 20 people accounts for 13.3%. From there, through both charts, deriving the size of the company, it should be aimed at small-scale companies with about ten people in a working organization.

To delve deeper into the clients' difficulties, the author decided to interview them with questions about how difficulties they often faced in their management work and gathered many answers. However, the most focused were two with the main reasons:

- Reason one: Their employees are often late for work and miss shifts for the wrong reasons while viewing the work schedule. They shared that the reason is that it is difficult to see the hours through photos taken and sent to a tough chat group to check the schedule because many employees, so it is not impossible to make mistakes.
- Reason two: At the end of each month, especially when checking the employee's total working hours for a month, the problem often occurs in the difference in working hours between the working schedule and the employee's actual work. Sometimes, when assistance is needed or work is being done, managers ask employees to work overtime or fewer hours than planned. From there, the two parties must take notes to remember and compare, and sometimes they forget, which leads to a discrepancy problem, and the manager feels that this should not continue for long, and there should be a decision.

Four main requirements for the products:

- Requirement one: A tool that suggests or automatically arranges weekly shifts helps them with repetitive work every weekend. They are looking forward to a function that suggests employees who have free time during the shifts they create, from which they save much more time.

- Requirement two: By comparing the discrepancy between the time on the schedule and the actual time, they require highlights to notify them to adjust, limiting them to only settling at the end of each month.
- Requirement three: There should be a summary of working hours by week, month, or year to get an overview of the total working time of each employee.
- Requirement four: To minimize the fact that employees are often mistaken and miss shifts, there should be a notice to prevent missed shifts, as the consequences are pretty challenging.

Market

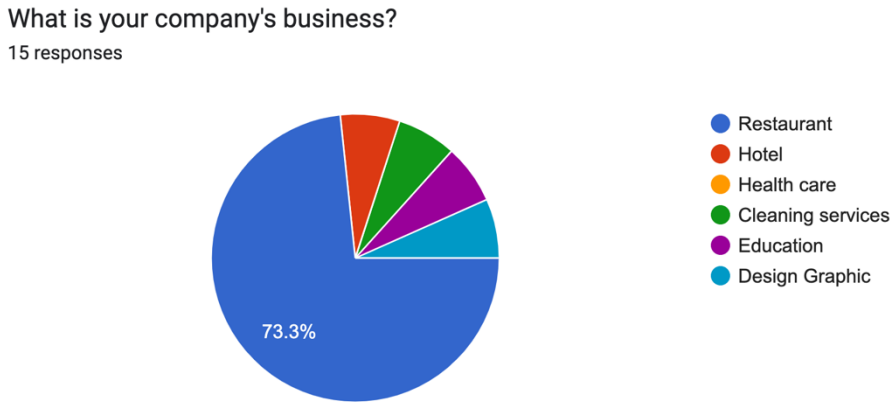

Figure 6. Company Business Chart. (Appendix 1.)

The chart with questions about the company's business is also important because it clearly shows the market's current situation. The number of users wishing to use this support software accounts for most food service provision, with 73.3% (Figure 6), a massive number in the survey. The remaining industries only account for a minimal market share.

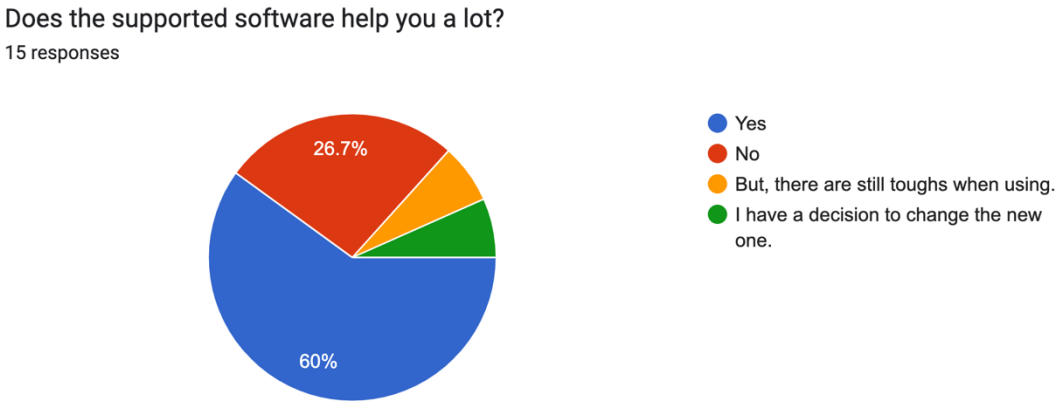

Figure 7. Chart surveying the usefulness of supporting software. (Appendix 1.)

With the survey question shown in the chart (Figure 7), the software tool helps managers in their work with 60% of "Yes" answers, more than twice as many as "No" and others.

Through the survey, the analysis shows that the product to support management is top-rated because management has many difficulties, and consumers (here are managers) want a tool to help them arrange shifts and things related to that work. Products that can assist managers in reducing the time it takes to arrange shifts and help them when problems occur will be well received and used in the market.

Competitors

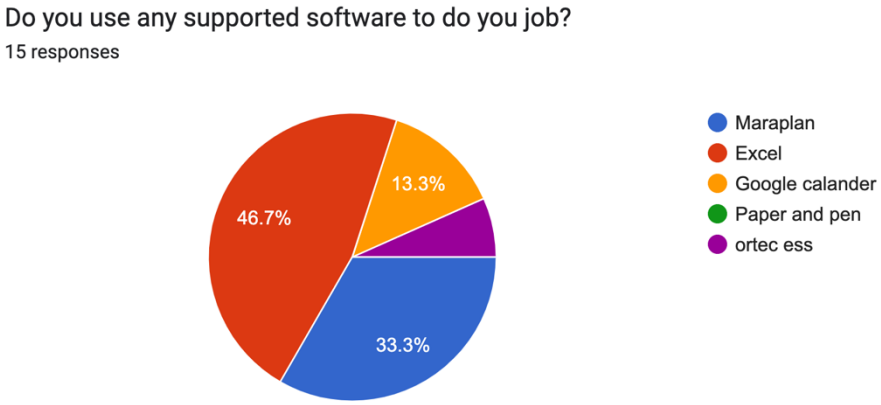

Figure 8. Competitor survey chart. (Appendix 1.)

The survey is designed to find out what devices and tools users use in their daily work. In the pie chart, the highest percentage is Excel software of Microsoft Corporation with a figure 8 of 46.7%. In the survey, many small organizations use them quite commonly to organize and calculate working hours for employees because the main reason it provides is freebies and the essential things they need. However, please do not count the inconveniences of using them. The next place, with 33.3%, goes to Maraplan. This strong competitor specializes in supporting users with virtually all the functions managers require for a monthly fee for using the service. Through the survey, the author collects most of the preferred restaurant chains that use this product, but only with companies with many branches and medium and large sizes. Google Calendar is also one of the free tools and is used at a rate of 13.3%. Finally, a small offer from a surveyor shows a new competitor called Ortec Ess. However, in the survey, this software was not widely used in the survey scope.

3.1.4 Persona

After completing the survey with users (future customers), the author created a customer model for the company that uses the products and services. They are also typical customers after completing the product. The business team focuses carefully on these customers.

NAME

Minh Nguyen

ROLE

Manager store

Demographic

Gender: Male

Age: 28 years

Marital status: Single

Location: Vantaa Finland

Industry: Food and Beverage

Motivations and Needs

A good tool will help them collect the employee's free time and help him in arranging the work schedule for the employees.

Goals

My goal is to make my job easier and not spend too much time working on weekends. Because of work problems that prevent me from having fun outings.

Challenges

- In addition to sharing information with each other at work, I must also announce other important things, such as requesting free time, in the same group chat. I find this makes it difficult for us including managers and employees to check our schedules.
- I use paper and pen, Microsoft's excel software as a support tool in my work, but I still have difficulty when unexpected problems occur such as unexpected leave or sick leave or I need to analyze the data which is quite time consuming.
- The difference in the total working hours of employees also makes me lose time to check every end of the month.

Story

I am a manager in a small-scale store, the number of employees in my team is less than ten employees, and the field I work in is an Asian restaurant.
Management is an interesting job and I am very passionate about my job, however I would be really happy if I did not spend too much time on my weekends. Besides managing, training and leading my team, I have a lot of other jobs outside such as placing orders, making reports on sales, expenses such as number of staff hours. It takes me a lot of time and the problems often occur at the end of every month. I am looking forward to a tool that helps me in synthesizing, analyzing and assisting me in arranging hours and working schedules for all employees.

Channels

Technology

Browsers

Figure 9: Persona

3.2 Understanding and Strategy

The author conducts UX strategy after completing the discovery and planning phases of the work schedule apps project. Moreover, this is also the stage where the author starts to map out the strategy before going into product design.

The reason for creating a UX strategy is to determine if the user experience when using a product or service aligns with the goals and objectives of the business.

Company strategy:

- Cheap - easy to use - focus only one central function Shift arrangement.
- Only collect product fees at the management account, ready to support creating free accounts for employees, aiming to build a community of many customers using and knowing the company's products.
- Compared to a competitor: High price - unnecessary credit for small and medium-sized customers.

3.3 Wireframe and Prototype

3.3.1 Interface Design UI

This is a crucial stage. After gathering data and information from the respondents, the author proceeds with a discussion to select the following designs and sketches to suit each product function. Besides, it is also attractive and makes users feel comfortable to use.

Before outlining the parts of an application, choosing the interface of the product to be divided into two parts: the user, who is the employee, and the user, who is the manager. Corresponding to each interface having different rules.

Based on the rules to create a beautiful design, color plays a very important role in the reason it brings a company color to the customers who use the product. With product, the author has the initiative to use two main colors in the product with black for the employee interface and purple interface for management users. Colors make it easy for users to identify. In addition, the author also wants to find out which of the two colors customers choose so that they can improve the product in the best way. The background color part is black

and purple. Text and other captions are used by contrasting colors to highlight the content and functionality of the product and correspond to each interface.

Staff Interface:

- Color: The primary color of the application is black, and the opposite text color is white. The functions in the application are selected as gray with more frames of lighter or darker colors, and the text color is also opposite to highlight the content inside.
- Devices: applications used on the phone platform.
- Icons: Refraining from using complex icons, as it confuses users and quickly gets impatient. Preferring to use the icons that are necessary for the app to mitigate the issue. It is not too difficult to find sample icons on websites, and the use of icons in applications is natural, as all products and services do. The author selects icons from Figma design software to use for products and services but is mentioned in theory. A good design is to select simple and understandable icons for users to easily access and use.
- Typography: Inter the author has not taken typography seriously yet. We only care about easy-to-read typography, conveying the content we want to bring to customers. Therefore, Inter style is chosen.
- Chart: The circle process was chosen by us to show in the Report section because it briefly and quickly understands an employee's progress over time. Users can understand how their working process works more efficiently than other charts.

Manager interface: Some distinctive features of the management interface is presented. The same parts are not repeated in this section.

- Color: Monochrome is used in the design for management. We want to have a difference between the two interfaces so that users can distinguish between employees and managers. The primary color is purple. Using purple with most of their color layers for backgrounds, text, frames, drawers, and almost everything in the application. Monochrome makes the application more professional and good-looking.
- Charts: Bar charts are used instead of pie charts as the employee interface does. Managers have an overview of employees. The bar charts are presented neatly and understandably. However, instead of placing it as usual, the author designed it vertically to match the interface (choosing a mobile device instead of other devices).

3.3.2 Wireframe

After having all the information from the steps of understanding, analyzing, and defining the target strategy of the product, the author starts by sketching out the user interface's main functions through a tool called Figma.

A user interface for employees

The interface has five sections: Header, Dashboard, Schedule, Set up Free-time, and Report.

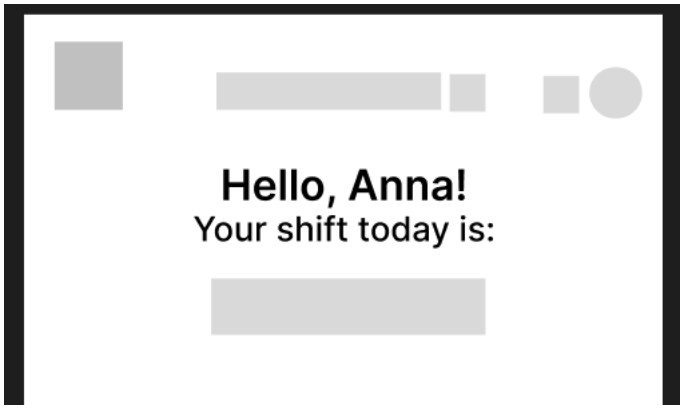

Figure 10. Header and Dashboard. (Appendix 3.)

The top of the application is designed horizontally. It starts from left to right corresponding to the company logo, a search bar, an icon button announcing new news or changes in the schedule, things that affect the schedule and work of employees, and finally, the employee's avatar of that application account with the function that the employee can interact with when clicking (Figure 10).

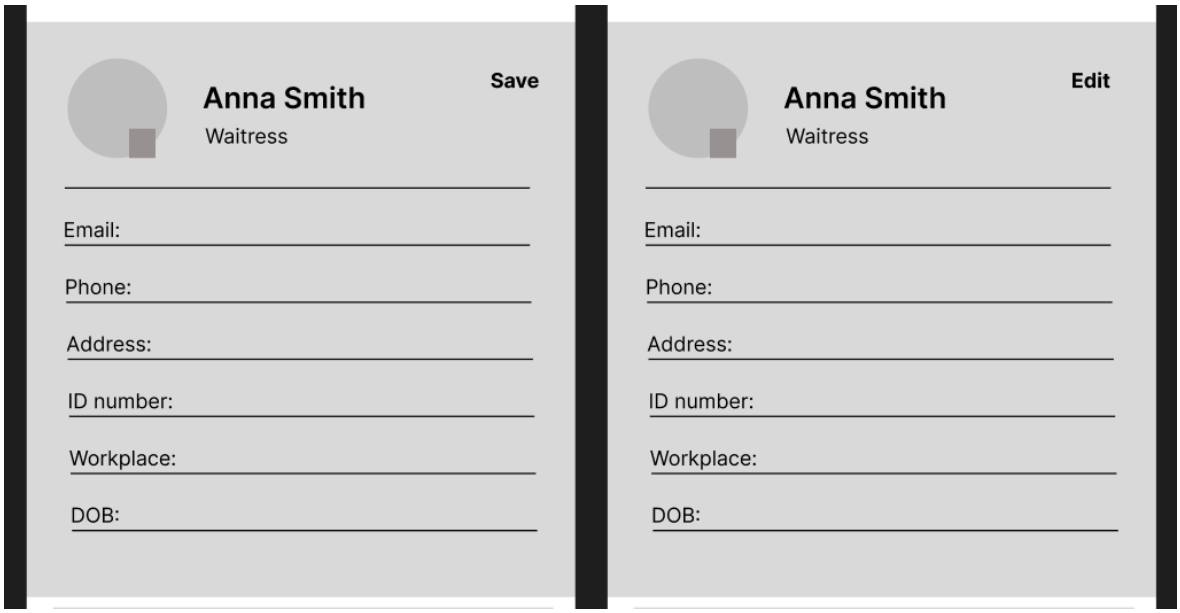

Figure 11. User Information. (Appendix 3.)

Employees can view and correct their information.

The next section is named Dashboard, and Figure 11 presents the employee's working hours at the top of the app so that each time the employee accesses the app, it is easy for the employee to see their working hours at that time. Significantly limit the fact that employees forget or miss their workday.

Figure 12. Schedule Field. (Appendix 3.)

The Schedule section (figure 12) allows employees to see their working hours each week. However, employees could only view their schedules during each selected week and not have any interaction.

Figure 13. Setting free time Field (Wireframe – Figma).

Setting free time is necessary for employees to leave their free time, from which managers can arrange schedules based on employees' desired hours. The employee clicks on the plus icon to create a time frame corresponding to the selected date, and a bottom drawer appears for the employee to continue setting up the free time (Figure 13). From what time to what time it starts, employees can also leave their messages so that the manager understands the wishes of each employee.

Figure 14. Report Field (Wireframe – Figma).

The last section is called Report, one of the main functions favored by customers because Figure 14 gives them an overview of their work process month by month in the form of a circle process. At this place, employees are set up by the management up to a month in advance how many hours they can work, thereby comparing with actual working hours so that each employee can see how much they have achieved in the whole process.

Manager interface

The interface is divided into six main functions to help support users: Header, Schedule, List Free-time, List Staff, Planning Schedule, and Report.

The Header part of the management interface is designed simply as the employee's interface. However, other parts are designed to suit the user.

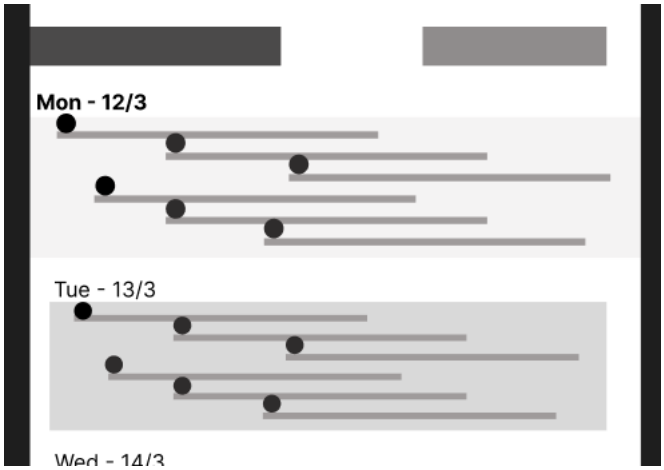

Figure 15. Schedule Field. (Appendix 3.)

The Schedule section is a section that displays all the time slots of each employee each day. From this area, the observer can see how many shifts are arranged and who oversees them. For more details, managers can interact by clicking on each day to bring up a bottom drawer, where users can see information about each shift and who oversees that shift (Figure 15).

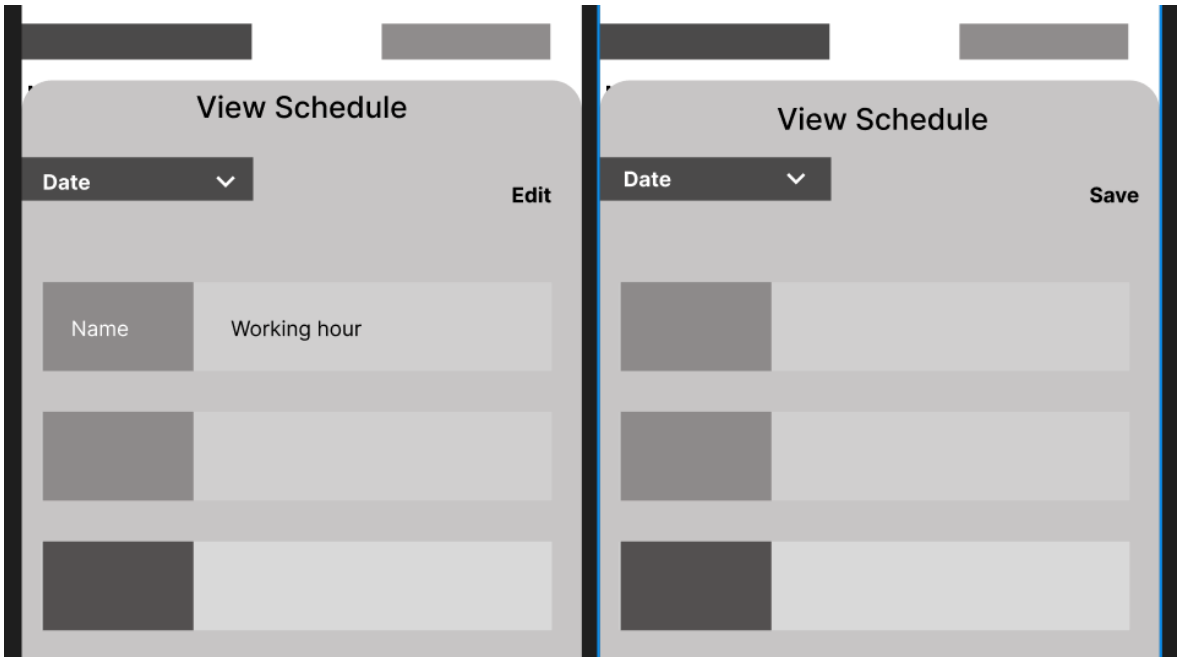

Figure 16. View Schedule Drawer. (Appendix 3.)

Managers can easily change shifts (figure 16) when something goes wrong. For example, employees taking unscheduled leave due to illness or employees applying for overtime can be adjusted directly here. It is essential that when a change is made, all employees receive a notification about the change.

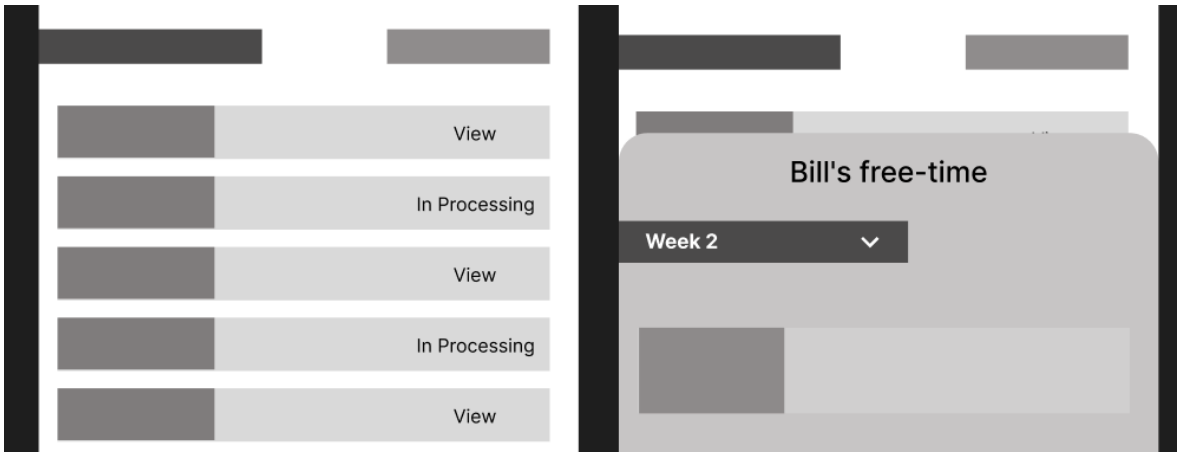

Figure 17. View List Free time Field . (Appendix 3.)

The List Free-time section is where managers can see each employee's free time for a particular week. There are two statuses: View and In Processing which equates that the employee has finished leaving his or her free time or has not yet. To interact and see specifically during each day of the week, managers can click on each word "View" or "In Processing" to follow.

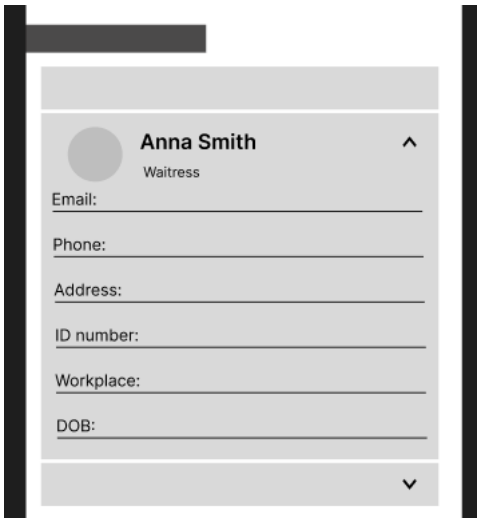

Figure 18. Staff’s Information Field. (Appendix 3.)

The list of Staff is seen in Figure 18. It is the next part of the application, where the lines correspond to each employee in an organization or workgroup. On the right is a down arrow icon where managers can interact to view employees' information such as email, phone, address, ID number, workplace, and DOB. When the information is displayed, the icon is changed to an upward arrow icon so that it can be closed when not needed.

The following section is where the manager can start the management work. The app has a circle in the middle that says "Planning schedule" which managers can click to start their work. However, there is an alert if the employee's free-time list needs to be filled. The design panel wants to limit user interaction during use and avoid unexpected errors in the application. Users have the choice to continue or cancel this planning task. If it continues, the user continues with sorting.

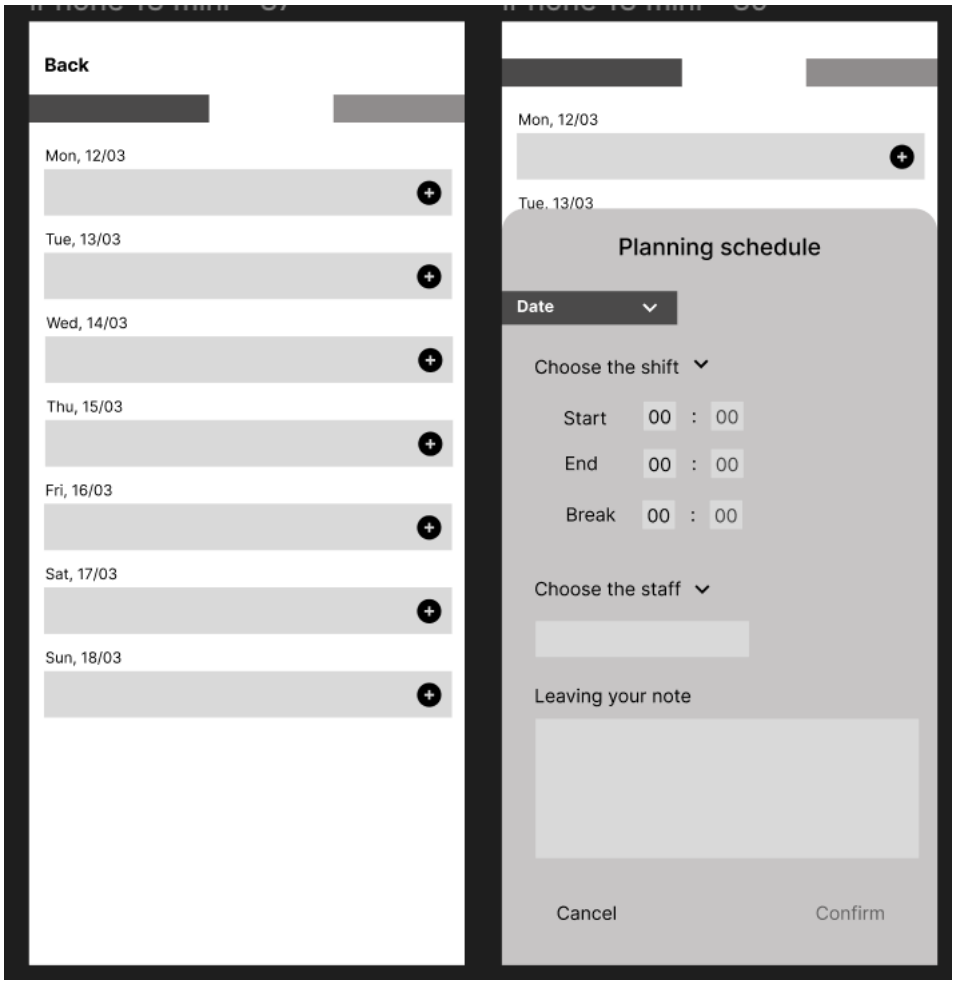

Figure 19. Planning Schedule Field. (Appendix 3.)

This is the planning schedule interface, and users choose the week frame they want to plan (week selection is the right button, parallel to the title field). To create refreshes throughout the day, users click on the plus icon to create a new one, which leads to the appearance of the bottom drawer (image on the right of Figure 19). There is a form sheet with three main sections to create a shift:

- Users select the shift time frame through the down arrow icon, and they can create new or select previously created shifts.
- Depending on the selected time frame, it displays employees with corresponding free time for the manager to choose to arrange for the shift.

- When announcing the work schedule, the manager's message to the shift employee is displayed.

Likewise, the managers arrange the shift working hours for the whole week.

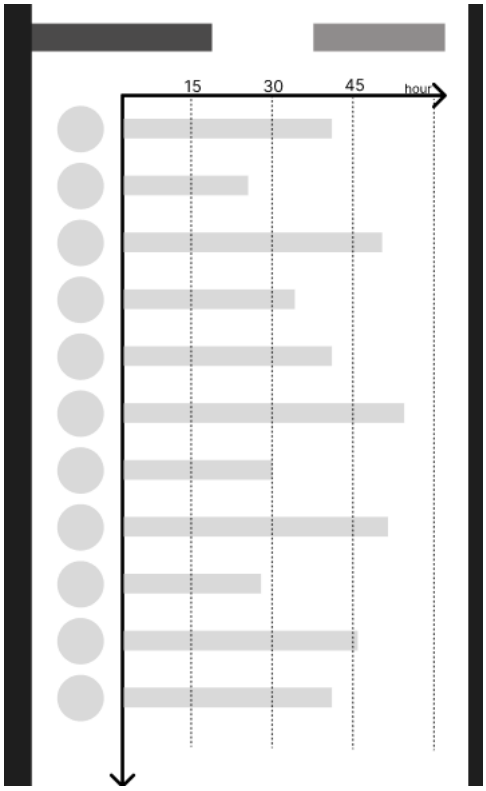

Figure 20. Report Field. (Appendix 3.)

The last part of the application is the Report, and users can select by month to see a column chart of the total working time of each group member. The column chart is placed vertically to save space when used in the mobile platform, and there are three number points in the column showing the hours 15, 30, and 45. On the side of the column displaying each employee's name is the employee's avatar (a way to save space and quickly recognize when observing). Users can directly click on each employee's avatar to see the entire time of the employee's shift in the month, and this is also a manager's job to confirm the employee's working hours at the end of the month.

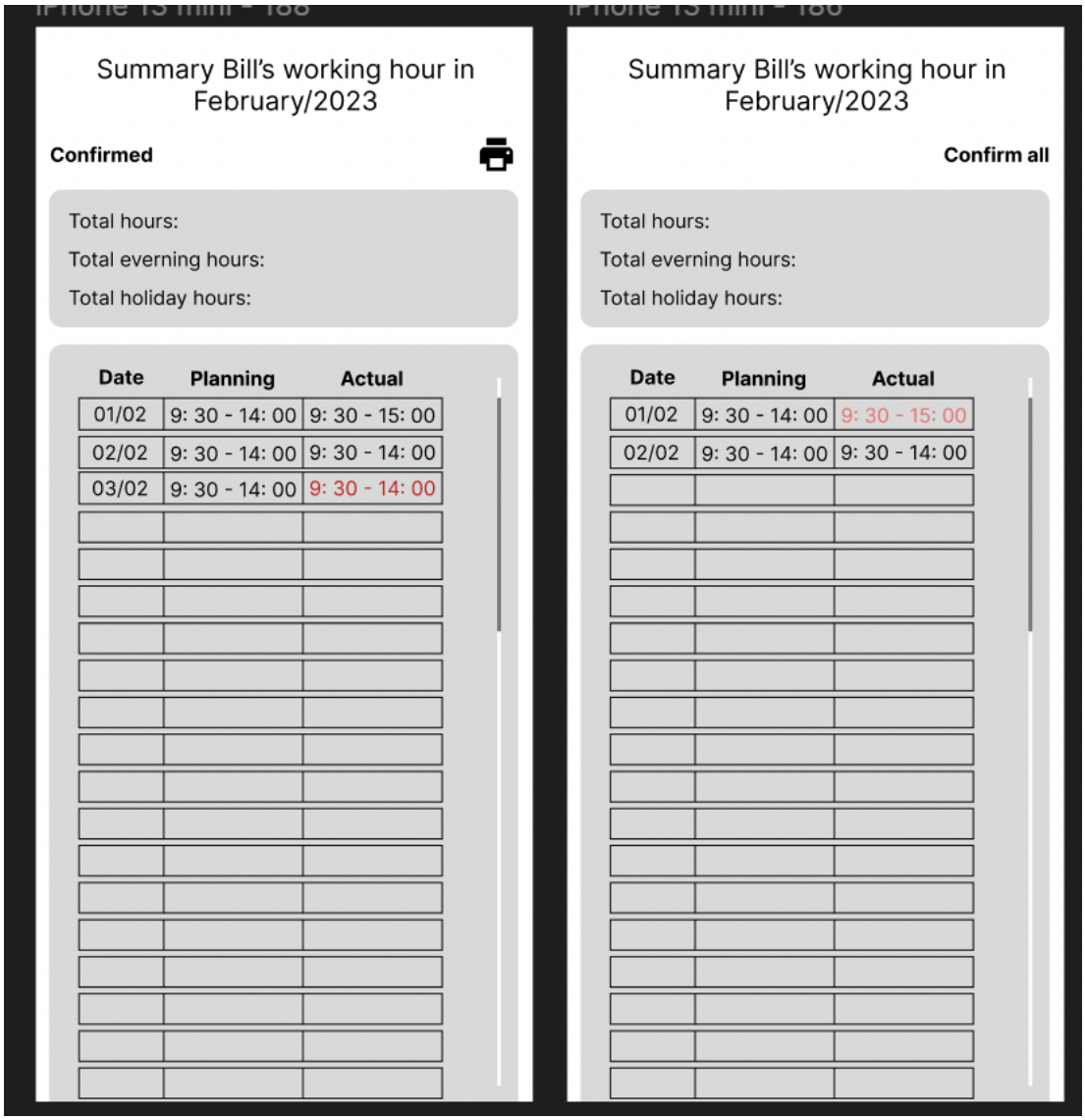

Figure 21. Report Table Field. (Appendix 3.)

Working dates and times on all shifts are displayed on tables for easy management and inspection at the end of each month. Managers click the confirm button to confirm the check and can print it to share with relevant departments.

3.3.3 Prototype

After designing the product sketch, the author continues to the next step of creating the prototype. These prototype panels clarify and make it easier to visualize the actual product than the sketch board. Everything is presented as an actual product with fake data applied to the previously planned interface rules.

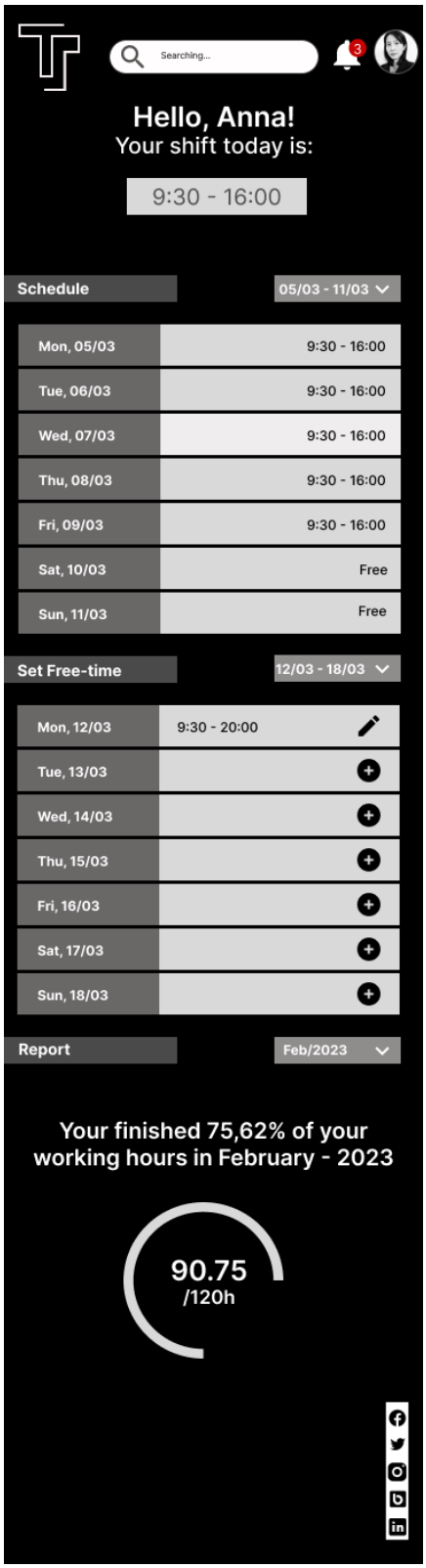

Figure 22. Employee Interface. (Appendix 3.)

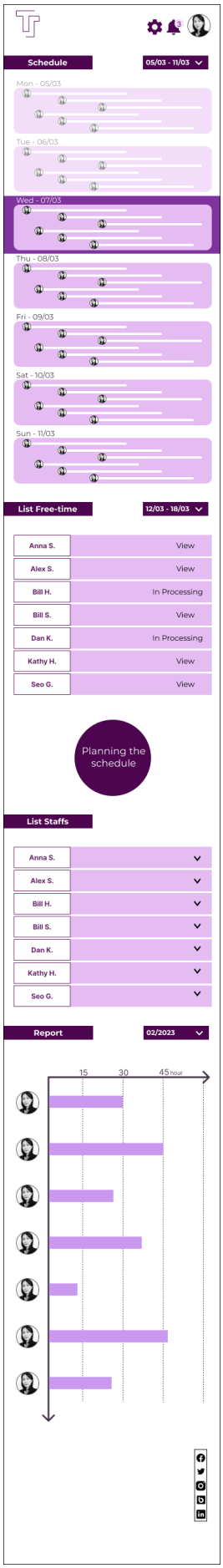
Schedule
05/03 - 11/03
Mon - 05/03
Tue - 06/03
Wed - 07/03
Thu - 08/03
Fri - 09/03
Sat - 10/03
Sun - 11/03
List Free-time
12/03 - 18/03
Anna S.
View
Alex S.
View
Bill H.
In Processing
Bill S.
View
Dan K.
In Processing
Kathy H.
View
Seo G.
View
Planning the schedule
List Staffs
Anna S.
Alex S.
Bill H.
Bill S.
Dan K.
Kathy H.
Seo G.
Report
02/2023
15
30
45 hour

Figure 23. Manager Interface. (Appendix 3.)

3.4 UX Research

After designing two designs for employees and management, the author started with research and created an additional survey to ask the people who had been surveyed before.

This is a type of survey to improve the product's design to meet the customer's needs, and the product's primary purpose is to solve the user's problem.

The first part of the survey work is for the surveyor to go through two blueprints through two design panels using the Figma tool for design. Next, in the survey, asking the surveyor questions about two parts: the part of employee design and the part of management design.

The design for staff: asking how users feel about this design and whether they can share what essential functions they would like to have in the product if they do not appear in the design panel.

The design part of management: giving them a demo of the product's design for them to feel and use. Next, how they feel and what they think when using the product to improve the product.

3.5 Analysis

After the first survey to gain insight into the market, users, and competitors, continuing with the second survey asking users to improve the timekeeping offerings, unlike the first survey, the interview had ten managers of restaurant and hotel areas directly to get a look at improving our design.

Employee design section

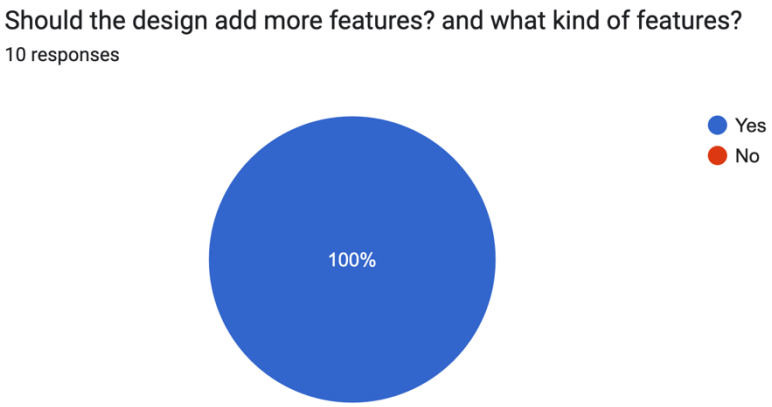

Figure 24. Survey Improve Employee Interface Design Chart. (Appendix 2.)

With a pie chart of user opinions after using the employee application, figure 24 shows 100% of the answer "Yes" for redesigning the application. The author received many comments asking for additions and improvements to the employee interface with additional comments requesting:

- Requirement one: Add confirmation to the employee after the end of a shift if there is a change in working hours from the planned work schedule. This leads employees can leave messages asking to correct their work after working hours.
- Requirement two: Add a section so that employees can review all their hours worked during a month of work and see why their job change messages have been accepted or rejected.
- Requirement three: Regarding the color interface, receiving feedback so the employee's part matches the color of the management interface to create familiarity.

Redesigning the product with the best improvements from this valuable feedback.

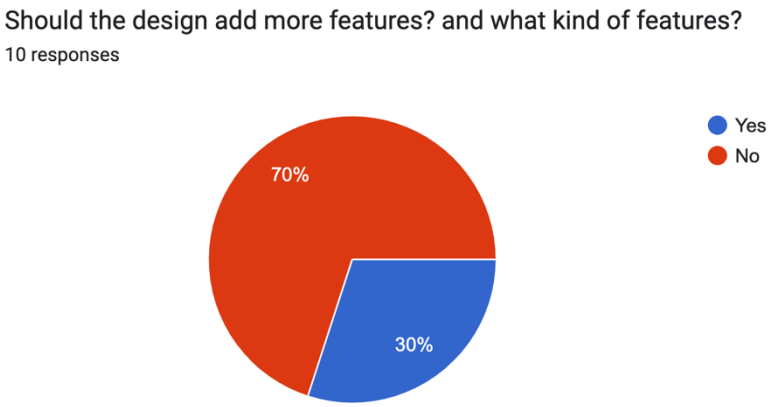

Figure 25. Survey Improve Manager Interface Design Chart. (Appendix 2.)

As for the manager's interface, good comments with a complete response to most of the needs managers need. From Figure 25, 70% agree that there is no need to modify the current management interface product, and 30% agree that it requires editing and adding a small function in the support tool. The opinions in interviews from customers are that they expect to be able to add or remove employees in their apps to facilitate organizing. Improving and redesigning to bring the best-designed product.

3.6 Design Prototype

Based on the analysis, Improving three essential requirements to improve the employee interface design product.

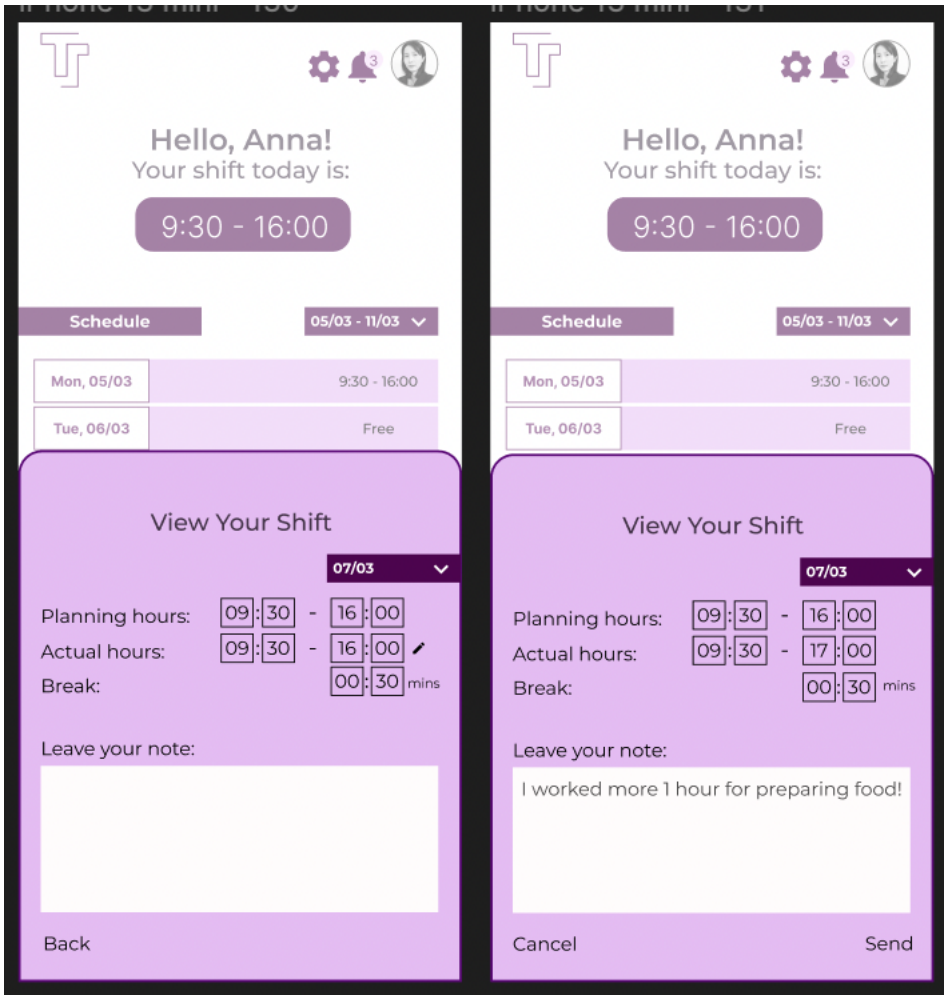

Figure 26. View Your Shift Drawer. (Appendix 3.)

Requirement one: Add functions to connect employees and managers during work through shifts. Employees can click on their shifts and report their working hours when a change occurs. The sample is as Figure 26.

Requirement two: The color of the design panel has been changed according to the management interface to create consistency in the application, making customers feel comfortable.

Figure 27. View The Summary of Month. (Appendix 3.)

Requirement three: Employees can review all their shifts through a whiteboard, where employees can check for discrepancies between previously planned work times and their actual working hours. However, management approved that change with three states: accepted, rejected, and waiting (Figure 27).

In addition, Improving several other support tools to make the product easier to use, more accessible, and smoother operation for the best experience.

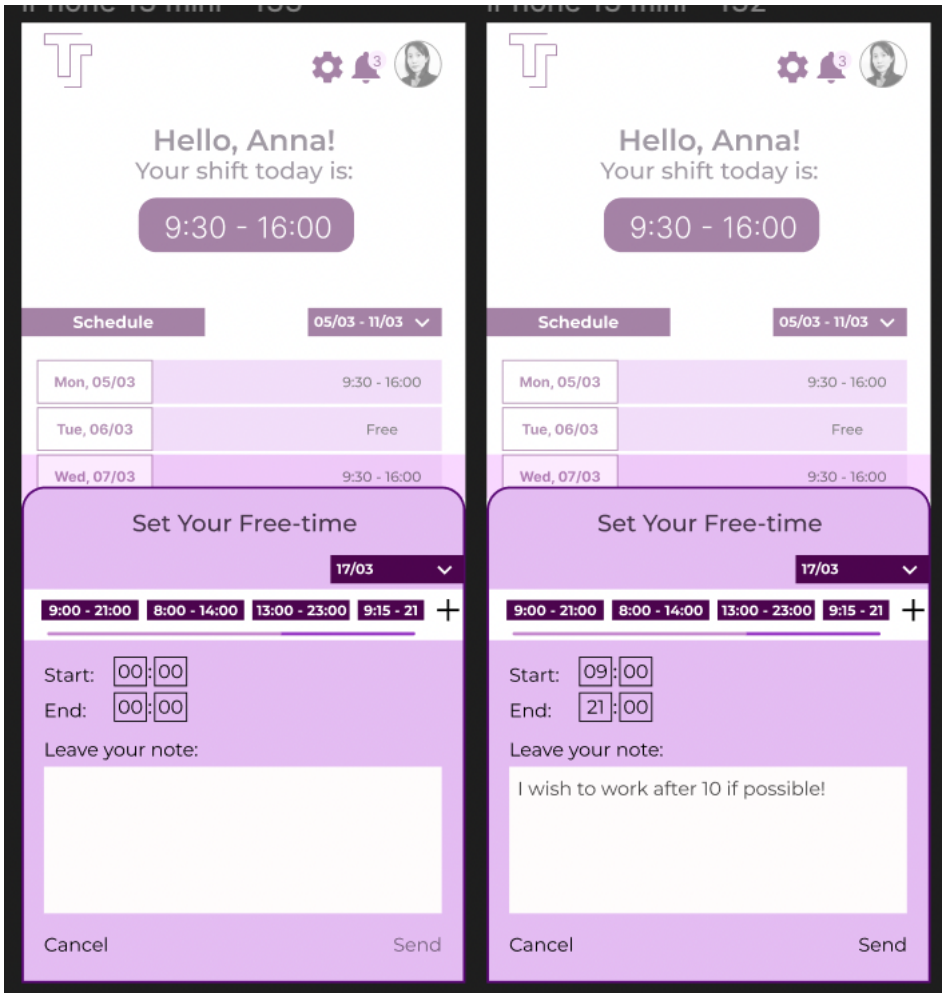

Figure 28. Set Your Free-time Drawer. (Appendix 3.)

The horizontal bar contains many time frames to help employees set up their free time by saving commonly used time frames, simply clicking on the typical time frames to save time (Figure 28).

Improving the design table always has a link between the two interfaces together. If adding utility functions to the employee interface, the management interface also changes through two main requirements.

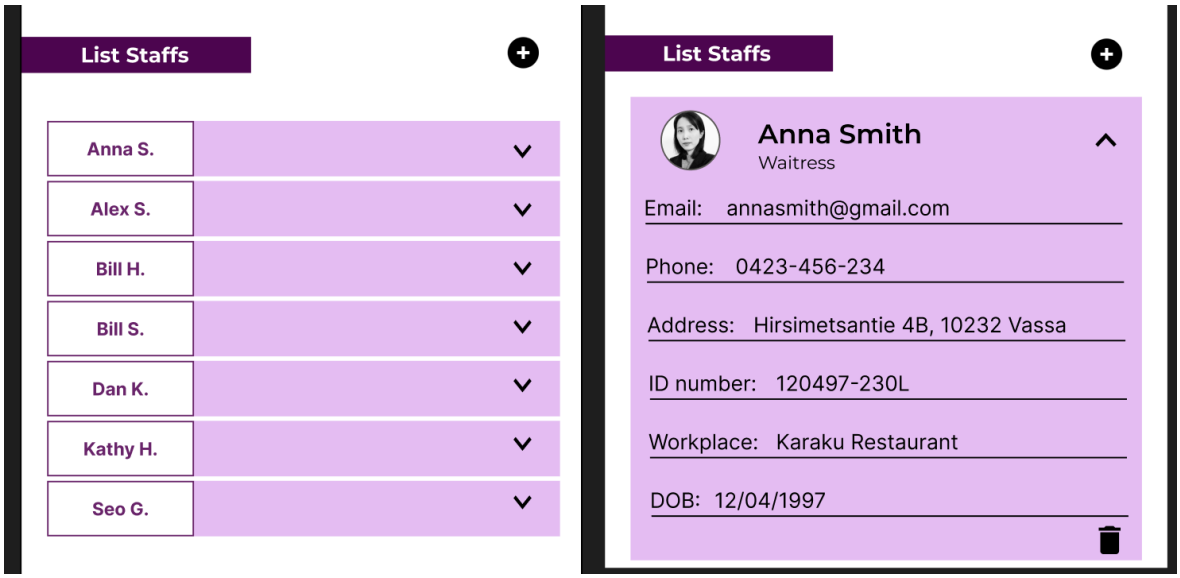

Figure 29. Staff's Information. (Appendix 3.)

Requirement one: Users easily add or subtract the number of employees in an organization managed by themselves, as shown in Figure 29.

Figure 30. Staff Summary of Month. (Appendix 3.)

Requirement two: The summary of everyone is detailed through two parts: a summary and a detailed table (Figure 30). In the summary section, the need of users to pay attention to only three main parts: the total working hours of a month, the total evening working hours (the working hours after 18 hours), and the total working hours of holidays (the working frame on Sundays and official holidays). In the table section, record all employee shifts for that month, totaling three columns: dates, planned shifts, and actual shifts. Next, comparing the planning and actual hours to avoid missing working hours for employees when there is a difference between the two-time frames, a red color is displayed to indicate an incompatibility with the manager, which the manager accepts or rejects.

Figure 31. Check Planning and Actual Hours Drawer. (Appendix 3.)

The decision to reject the difference between the two-time slots must leave the manager's reason in the form in figure 31 so that the employee receives the appropriate reason for rejection.

3.7 Validity and reliability

Reliability and validity are two important factors to judge whether a thesis that is good or vice versa. When evaluating an essay, the judgement of reader depends on the author, who cares in two aspects during doing the thesis, reader accepts the thesis by validity and reli-

ability. A thesis is very subjectivity because of doing by only one author, but if careful attention is paid to the factors of reliability and validity, objectivity reduces the scepticism of the reader.

Reliability is the property of consistency of a used method if the high level of consistency leads to exact in this method. When the research questionaries are repeated for surveys or interviews and the conditions do not change much between each time, if its results tend to be consistent within the answers when asked the same question, reliability is rated high, and the thesis is also rated as reliable. Validity is the accuracy of a method relative to the properties, characteristics of facts in the real world. An easy way to understand the validity of qualitative research often has to do with the questions asking respondents. Validity means that the results will be factually accurate. (Middleton 2019.)

The reliability of this thesis is the series of responses given by interviewees to surveys. The job of interviewees oversees arranging the shifts of employees in the workplace and they often must do work that is related to the value of the application product. The author has carefully selected and invited them to participate in the interview for the most reliable results and data. The answers from different observers share the same common point in the questions, it leads the consistency of the answers brings high reliability in the research method that the author has chosen. In this thesis, the author has set up two questionnaire forms for two surveys to collect data. The validity of this thesis was judged by the responses to the interviews, which are realistic and relevant to what is happening in the real world.

4 Summary

To summarize, the thesis has a design UX/UI topic for the working application. With the idea of bringing technology into work, the author and her friend proceeded to create an idea to bring a software product that supports the work of shift managers in companies, targeting small and medium scale. In this thesis, the most important goal is to apply UX/UI to design for this future application. The author wants to use the knowledge of UX/UI to help the product increase customer interaction. A research and knowledge investment helps the product become more successful. The author researched the market, competitors, and customers to get a general picture of the applied product. The method chosen by the author was qualitative. Through questionnaires, interviews are conducted, and the number of answers is information that helps the author get an overview of customer needs and product values that need to be used to support customers. After all the steps in a long process: Discovery, Survey, Research, Analysis, Strategy, Sketching, and Design, the author has developed a complete design product (Appendix 3.) with two interfaces, including employee users and shift managers.

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Appendices

Appendices 1. Discovery Survey

Question 1:	Can you please tell me how the scale of the area you manage?
Question 2:	What is your company's business?
Question 3:	How many team members in your work place?
Question 4:	Do you have any problems or toughs in your work?
Question 5:	Could you share your problems?
Question 6:	What do you expect the software support you during your work?
Question 7:	At the moment, do you use any supported software?
Question 8:	Does it help you a lot?
Question 9:	Does it have any problems?
Question 10:	What kind of devices you want to work with?

Appendices 2. Improvement Design

Question 1:	After viewing the design employee interface, what do you think?
Question 2:	Should it add more functions? Could you share which functions?
Question 3:	After viewing the design manager interface, what do you think?
Question 4:	Should it add more functions? Could you share which functions?

Appendices 3. Wireframe and Prototype (design and improved design).

Available at:
https://www.figma.com/file/W6rLsJOCaS60PMAiep74Hw/Untitled?node-id=209%3A1858&t=z78UP2YtAoSDBQ8A-1

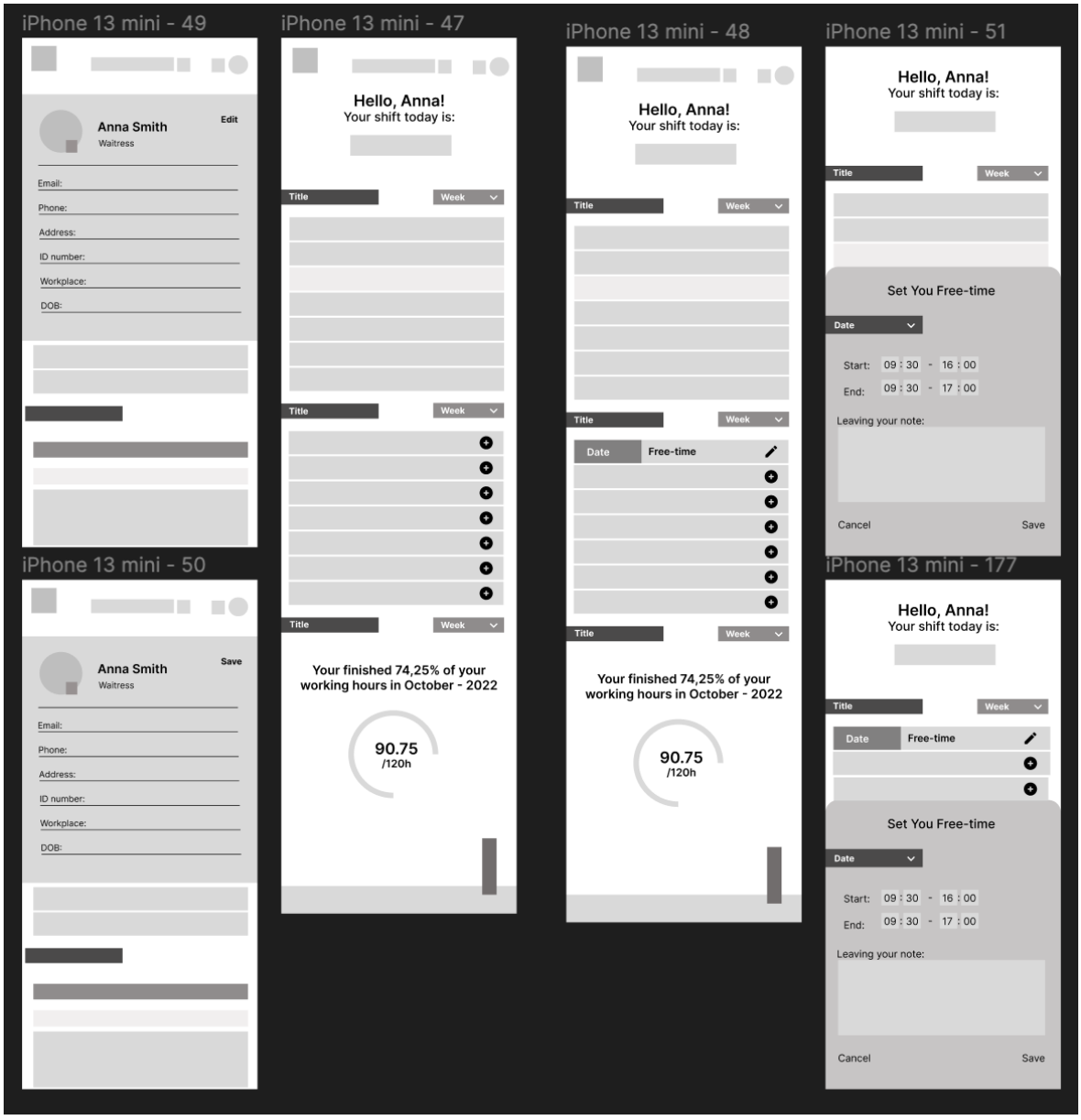

Figure 1. Wireframe Employee Interface.

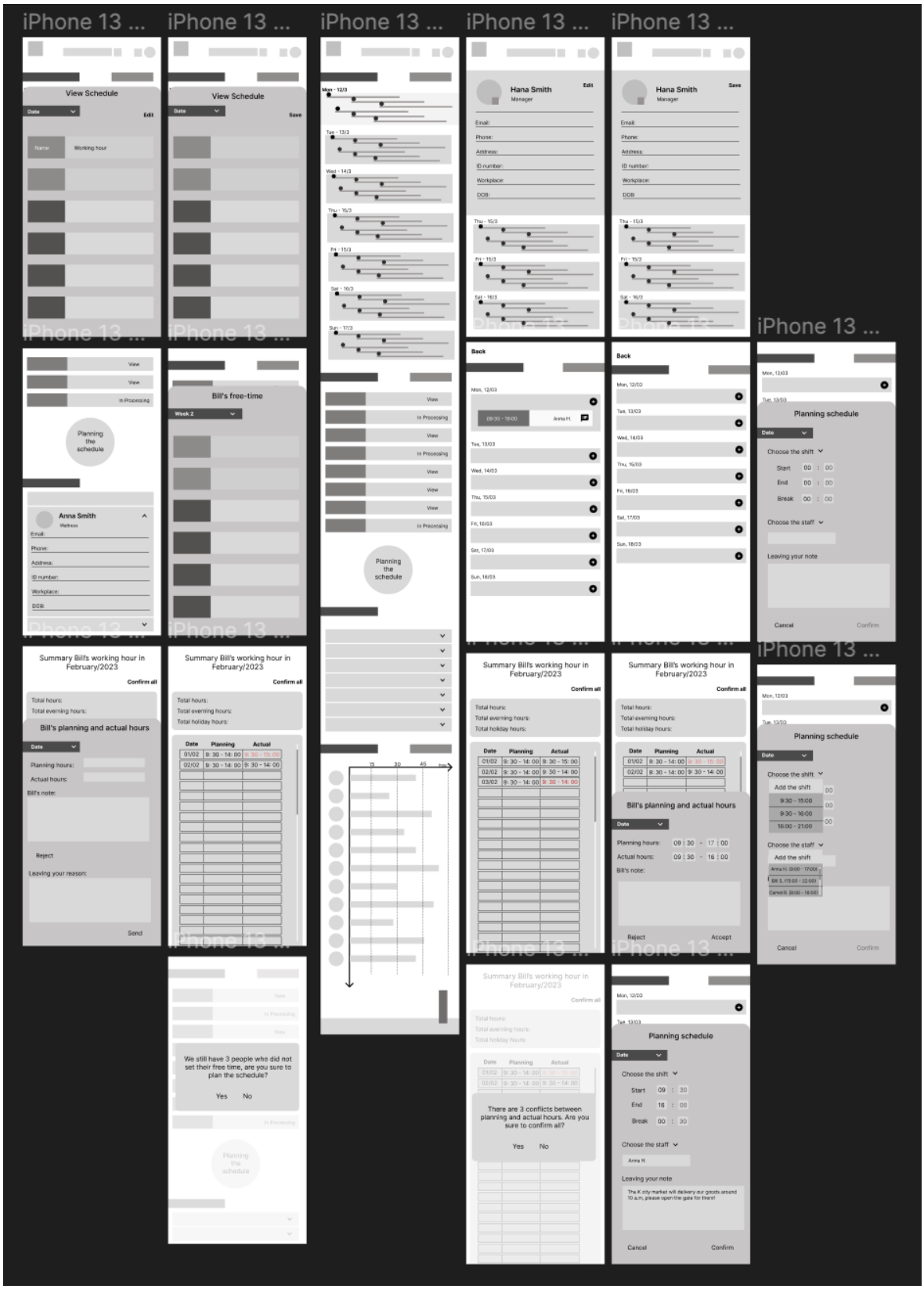

Figure 2. Wireframe Manager Interface.

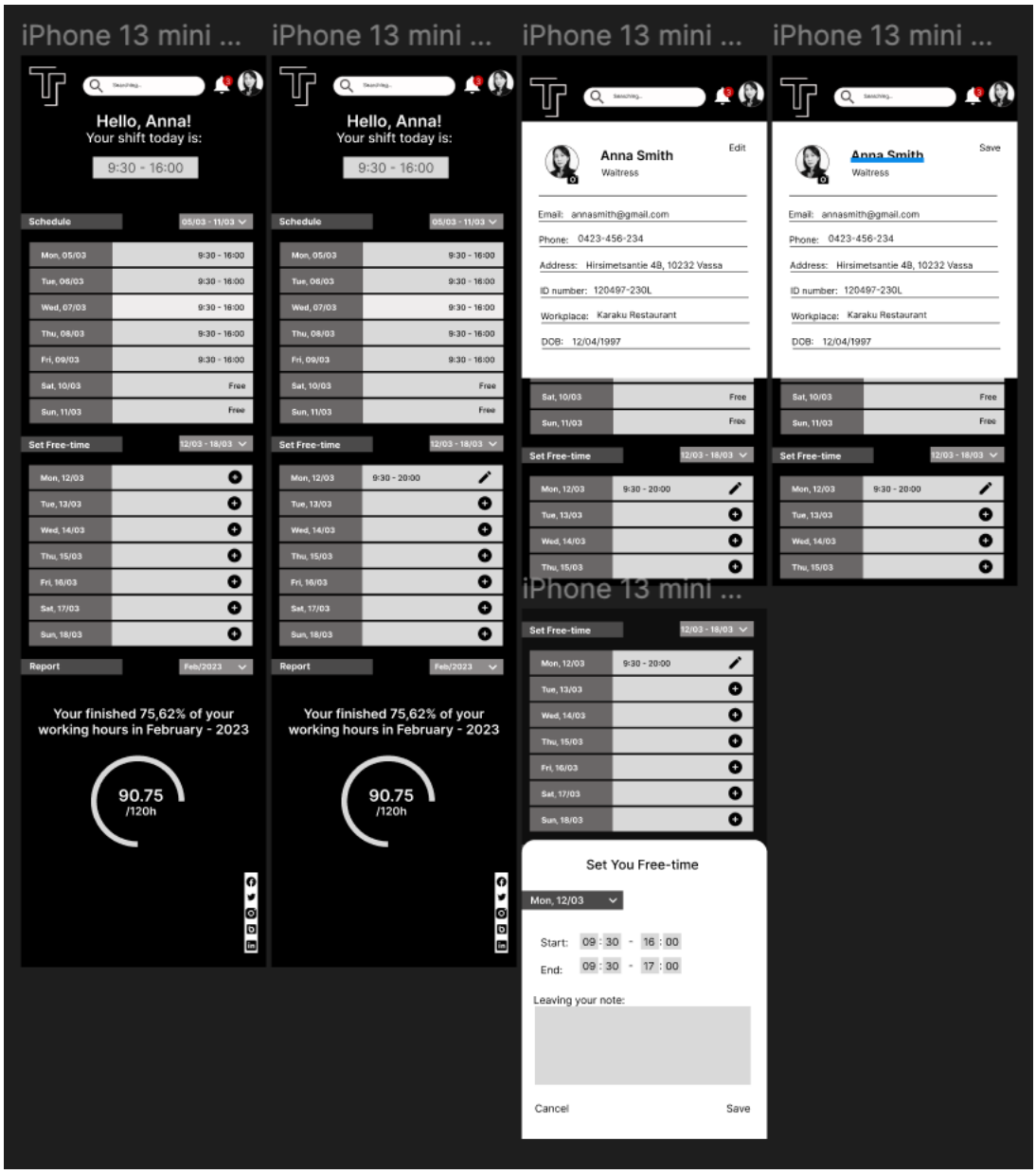

Figure 3. Prototype Employee Interface.

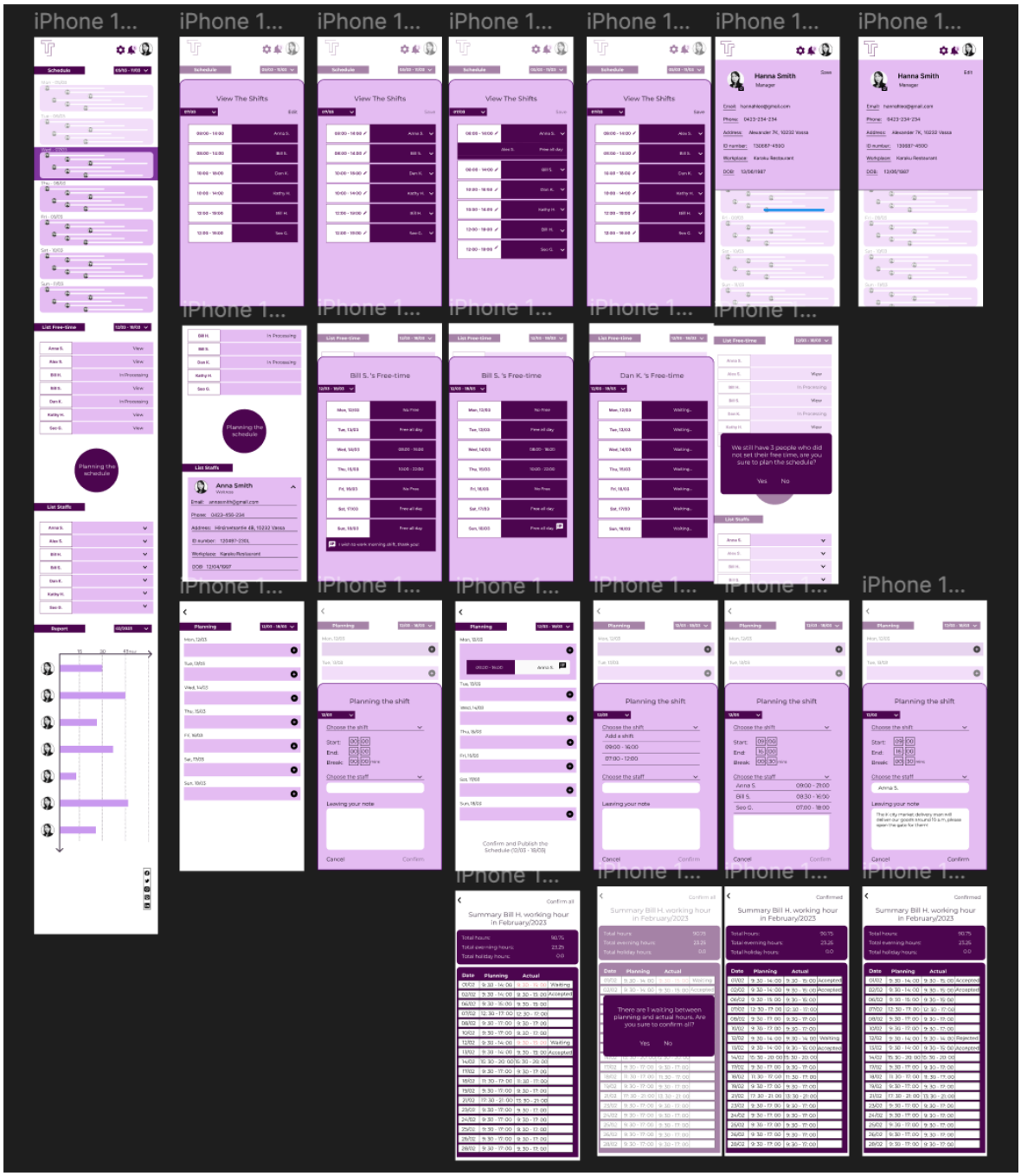

Figure 4. Prototype Manager Interface.

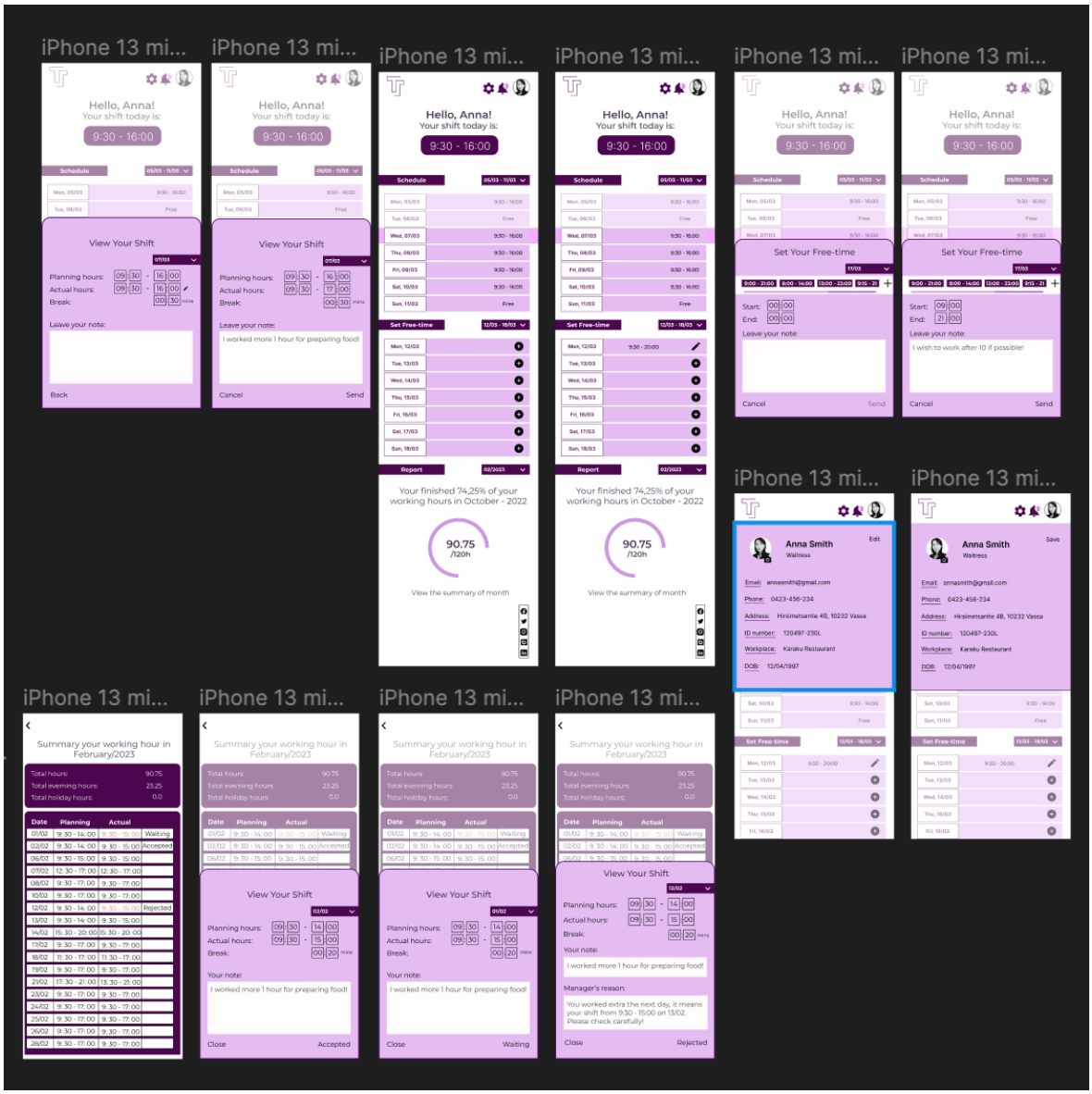

Figure 5. Prototype Improved Employee Interface.

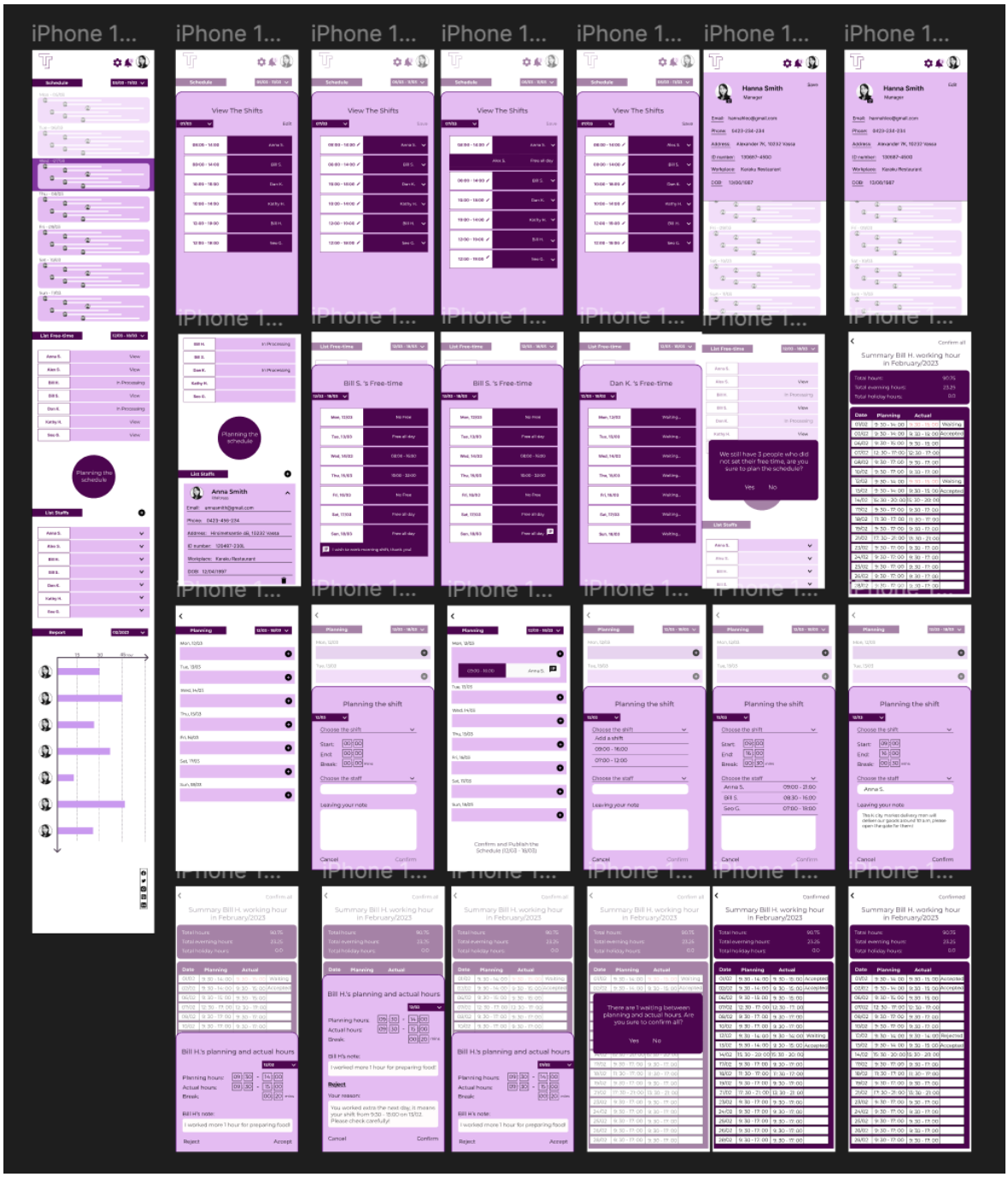

Figure 6. Prototype Improved Manager Interface.