

An App for Measuring Guest Satisfaction During a Hotel Stay

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During a Hotel Stay**

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Abstract

This study concerns guest satisfaction and feedback which are important aspects when working with customers. In the hotel industry this is especially important since good service is about knowing your guest. The hotels want to be aware of any concern while the guest is still at the hotel to be able to compensate before they leave. In order to do so, the hotels need a better communication with their guests during their stay. This thesis investigates how to measure guest satisfaction in an app during a hotel stay. From interviews, seven evaluation questions were designed as an example to suit a seven days hotel stay included when it should be sent to the guest. Thereafter four design iterations were carried out to find how notifications with evaluation questions should be designed to appeal potential users. These resulted in four design examples of different ways to grade a specific evaluation question and three of these were thereafter implemented. It resulted in an app with evaluations that was easy to understand, quick to perform and with a joyful design.

keywords. User Experience, Rating Systems, Evaluation, Hotel Reviews, Guest Satisfaction.

Sammanfattning

Denna studie berör gästnöjdhet och återkoppling vilka är viktiga aspekter när man arbetar med kunder. Speciellt inom hotellindustrin är detta viktigt då bra service handlar om att känna sin gäst. Hotellen vill veta alla bekymmer eller funderingar som gästen har medan de är kvar på hotellet för att kunna kompensera innan de lämnar. För att möjliggöra detta behöver hotellen ha bättre kommunikation med hotellgästen under hotellvistelsen. I den här studien undersöks hur man på bästa sätt mäter gästnöjdhet i en app under en hotellvistelse. Baserat på intervjuer så har sju utvärderingsfrågor utformats som ett exempel för en sju dagars hotellvistelse, inklusive vilken tidpunkt de bör skickas till gästen. Därefter genomfördes fyra design iterationer för att ta fram hur notifikationer med utvärderingsfrågor bör vara utformade för att tilltala potentiella användare. Detta resulterade i fyra designförslag med olika sätt att ge ett betyg till en specifik utvärderingsfråga och tre av dessa var därefter implementerade. Det resulterade i en app med utvärderingar som var lätta att förstå, snabba att svara på och med en tilltalande design.

Nyckelord. User Experience, Omdömessystem, Utvärdering, Hotellrecensioner, Gästnöjdhet.

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Chapter 1

Introduction

1.1 Background

If a guest is leaving a hotel in frustration, the risk of a bad review online or spreading of bad reputation is high. If the hotel could have known how the guest felt before departure, the guest could have left with a completely different attitude towards the hotel.

It is very important for hotels to identify and compensate unsatisfied customers in an early state of the stay, before they come home and write bad reviews online [3]. A bad review can destroy a hotel's rumor and therefore impact the amount of bookings and consumer trust.

Research shows that a guests mood state have direct and indirect effects on behavior, evaluation, and recall [10]. Therefore it is important to find out when the guests are in a good mood and most satisfied with their stay so they can answer evaluation forms at that point in order for the hotel to receive as positive reviews as possible. Another important factor is that the evaluation forms have to be smooth so the customers does not find it annoying or intrusive.

This thesis will investigate how to measure the guest satisfaction continuously in an application. The investigation will process what kind of information the hotels consider valuable and when the guests are most likely to answer an evaluation. This study will also cover how the evaluation should be designed with an iterative process of development, test sessions and improvements of several prototypes to achieve the best result possible.

1.2 Tactel AB

This study is a collaboration with Tactel AB, which is a digital interaction agency based in Malmö [26]. Tactel is part of Panasonic AB since 2015 and has about 100 co-workers.

They deliver digital solutions to clients that improves their digital relations using designs, techniques and insights of the user's needs.

1.2.1 Hotel Project

One of Tactel's projects is requested by a luxury hotel in a tropical country. The project is an application with functionalities that the hotel guests will use before, during and after their stay to check-in, book services and find information etc..

Tactel wants to develop the application with an evaluation functionality to measure the guest satisfaction during a guest's stay to be able to compensate complains and handle requests as fast as possible.

1.3 Purpose

The purpose of this thesis is to investigate how to measure the guest satisfaction of a guest's stay in the most optimal way. This includes when the guest is most likely to want to answer, what should be evaluated and how to design it with a good usability that appeals the user.

The following research questions will be taken into consideration:

- What information is valuable for the hotels to know about their guests?
- When are the guests most willing to answer evaluation forms?
- How should the evaluation be designed to generate a high response rate?
- What are the reactions to our implemented application?

1.4 Related Work

Hanna Bayerlein and Fredrik Lütz have analyzed different ways for a company to collect user feedback, without being intrusive and time-consuming while at the same time ensuring a high ratio of answers [4]. They developed several prototypes and tested them on potential users. Their conclusion was that the users wanted to put as little amount of effort as possible and it showed that systems with as few clicks as possible were preferred, meaning that e.g. the "Send"-button was not to be desired. The results also showed that rating systems with high user satisfaction was more prone to be used again, it should be optional for additional information and finally that the most intuitive rating scale turned out to be the star scale since people strongly connect it to be a tool in which you rate or review things. These conclusions will be considered when developing the prototypes of evaluations in this project.

This project is different from their work since the application will have functionalities that constantly tries to improve a guest's hotel stay by asking relevant questions. The design process will be more focused on creating a joyful experience and engage the users with fun colors

and different types of rating scales to generate variety.

Jon A.Krosnick and Leandre R.Fabrigar has investigated some aspects in how to design rating scales for effective measurement in surveys [1]. They have among other things concluded that a rating scale should have a neutral value which will be taken into consideration during this project and it will be investigated if it is true for this project as well.

1.5 Limitations

To decrease the scope of this project some limitations were made. It is assumed that the hotel guests already have downloaded the application, therefore it is not considered that some users do not want to download an application for managing their hotel stay.

It is assumed that it is a luxury hotel for a typical sun and sea holiday since a normal day can vary a lot depending on location and expectations. Also, tolerance can vary depending on how much someone has paid for a stay.

In this project, the design and implementation of evaluation forms and notifications will be developed separately from the hotel application that is being developed by Tactel. The aim is to integrate the evaluation functionalities into the already existing application, however that will not be done during this project.

1.6 Work Distribution

We have both contributed to this project equally. Every interview, analysis, design decision and developing of test cases have been done together. To make the work more efficient we have been pair programming some parts and implemented some parts of the application each. Some of the more complicated functionalities like sending notifications were done together.

Chapter 2

Theory

2.1 The Design Process

Arvola [2] defines *Interaction Design* as the process to design and implement prototypes of innovative and interactive products and services that is manageable, understandable and liked by people. In other words it can be said that it is to create a good user experience. Interaction design has a big focus on practice, i.e. how to design a good user experience, but not in a strict way of how to do it, rather encourage to use some of many methods, techniques and frameworks [23].

User Experience (UX) is important in interaction design. Nielsen and Norman [22] defines User Experience as encompassing "all aspects of the end-user's interaction with the company, its services, and its products". Preece et al. [23] define it more specifically as "how people feel about a product and their pleasure and satisfaction when using it, looking at it, holding it, and opening or closing it". This means that UX includes people's overall impression of how good a product is to use, included emotional effects of small details such as how smoothly something move or how it sounds to click on a button. The latter definition is the definition that will be used for this project.

The process of interaction design involves four main activities [23]:

1. Establishing requirements
2. Designing alternatives
3. Prototyping
4. Evaluating

These activities should be performed as an iterative process where the prototypes are re-designed after evaluation. A *User Centered Design* approach is preferred to be used since

involving users in the process ensure that the development is keeping the right track and that the product fulfill a good user experience [23]. Adapting a user centered design process makes the iterative design process focusing on the end users. This means that all principles, techniques and methods to develop a product is based on real situations and on real users. Another important factor is to understand the users, e.g. how they act and interact with information and technologies in order for the designers to make good decisions in the development. In this project this will be achieved by interviewing potential users, observing them, let them answer different surveys and to test both Low-Fidelity and High-Fidelity prototypes on them. This project's different phases and activities can be seen in figure 2.1.

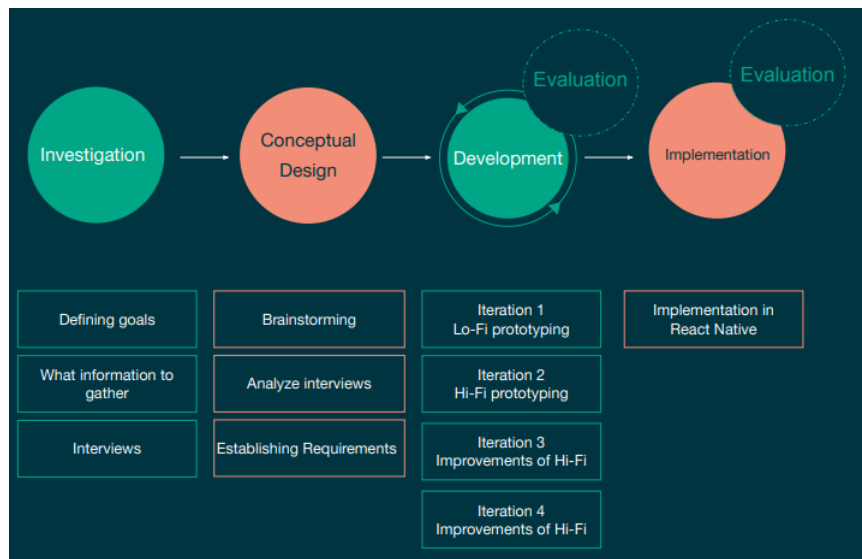


Figure 2.1: The design process

2.1.1 Establishing Requirements

This is the activity of understanding what the product should do [23]. A requirement is a statement of the product to be developed that describes what it can do or how it should perform. A requirement should be as clear and specific as possible. Data gathering for setting requirements is to collect relevant data so that requirements can be defined. It is important to understand people's needs and to include all stakeholders in this process. For gathering data, several methods can be used as for example holding interviews, observations and researching similar products. There is also different methods for analyzing the gathered data, one example is brainstorming that will be described in section 2.2.

2.1.2 Designing Alternatives

When some requirements have been established, design activities can be performed. Conceptual design is focusing on what the product will do and how it will behave [2]. It does not have to be the designer who has the best idea at start, it could be external people of the project or other stakeholders that has the best ideas on what could be done in the project. Therefore it is important to work divergent and to generate many ideas that can be compared

and evaluated. These activities aim at answering questions such as what, why and how the product should be developed.

2.1.3 Prototyping

A prototype's goal is to test the possible product's role, its appearance and the feeling of interacting with it [2]. A prototype can therefore test the usability, if the user understands how to interact with the product and it can test the graphic design to understand what appeals the user.

Lo-Fi Prototype

A Low-Fidelity (Lo-Fi) prototype is an easy, quick and cheap way of representing a concept [24]. The Lo-Fi prototype can be used to test and evaluate the concept or design. It is either hand drawn or hand made and it has very low or non functionality. To demonstrate interfaces, they are often sketched on papers. These are typically used in the early stage of the design process and is a great and cheap way to get quick feedback and find faults early in the process.

Hi-Fi Prototype

A High-Fidelity (Hi-Fi) prototype is a more complex and realistic prototype which the user can interact with and is definitely more similar to the final product than the Lo-Fi prototype [24]. Some parts should provide some functionality, such as clickable buttons, but it is common to have a static path that the user must follow during a test. The Hi-Fi prototype can be tested, evaluated and improved before implementing the final product. The Hi-Fi prototype takes more time to develop than the Lo-Fi prototype and is therefore more expensive to develop.

2.1.4 Evaluating

Evaluating and testing is important for several reasons [24]. Partly to ensure the product is useful and valuable for the user, it is easy to understand and that it meets the requirements. It also helps to identify problems and frustration. Other benefits are that it reduces the cost of service and support, increasing sales by improving customer satisfaction and reduces risks for bad surprises after releasing the final product. It is a wide range of what can be evaluated, both a particular function in a screen or the whole flow of an application. What, where and when to evaluate depends all on the specific situation and product being developed.

2.1.5 Usability

ISO [14] defines usability as "extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use". Another definition is defined by Rubin and Schisnell [24] who state usability as "the user can do what he or she wants to do the way he or she expects to be able to do it, without hindrance, hesitation, or questions". A usable product should fulfill following factors:

- **Usefulness:** how capable a user is to achieve his or her goals.
- **Efficiency:** how fast a user can accomplish his or her goal.
- **Effectiveness:** the degree to which the product behaves in the way the user expects.
- **Learnability:** the capability for a user to learn how to use the product.
- **Satisfaction:** the user's perceptions, feelings and opinions from the use of the product.
- **Accessibility:** the product should be useable by people who have disabilities.

2.2 Methods and Techniques

2.2.1 Guest Journey

A good way to put together insights from user studies is to map out a guest journey [2]. A guest journey consists of a series of touch points between the guest and the service. The journey then explains the guest's experience during time. A touch point can be for instance a face to face meeting or some interaction with a website or other information channel. Relevant touch points is typically found through meetings and interviews with the users and other stakeholders.

2.2.2 Brainstorming

Brainstorming is a creative method that is defined by J.C.Jones [15] as "to simulate a group of people to produce many ideas quickly". One important aspect is to encourage all different kinds of ideas without any criticism or judgement, since the goal is to reach for quantity rather than quality. It is also important to define a scope for the brainstorming session which for instance could be a problem or a task, but it should not be too wide or too narrow to be able to generate a good amount of ideas [2].

2.2.3 Affinity Diagram

An affinity diagram is used to analyze qualitative data by organizing individual ideas and categorizing it into themes [23]. The goal is to gather all unstructured data and group what seems to belong together. The purpose is to provide good insight in the users mindset, their goals and needs.

2.2.4 Dot-voting

Dot voting is a technique where each person in a group assigns a dot to each idea they want to prioritize [11]. Each member has a limited amount of dots. Dot voting is useful when you want to narrow down alternatives and prioritize what to focus on first. It is a simple tool to use when making decisions in a group and it is done democratically.

2.3 User Engagement

J.Nielsen writes in the article "Feature Richness and User Engagement" [19] that it is common that users' willingness to learn features and how the interface behaves is low. If that is the case, it is important to have a simple interface with not much complexity to encourage the user's engagement level .

A good usability and an excited user carries a high user engagement, and to achieve that it is important to make a strong first impression and gradually expose the depth of your product. This can be done by pleasing the user with nice colors or other design choices that capture the user's interest. In this study the application can gradually expose the depth of the product by asking one question at a time or start with a very simple question.

2.3.1 Testing Satisfaction

Traditional user testing is a great way to find bugs and parts of the system that users do not understand [21]. These tests can be modified in order to being able to encompass more enjoyable aspects such as fulfilling, engaging, and fun design elements. J.Nielsen presents two ways to test enjoyment in his article:

1. **A subjective satisfaction questionnaire**, at the end of the test session.
2. **Observations of the user's body language**, that especially looks for indications of satisfaction or displeasure (smiles or frowns), as well as for laughs, grunts, or explicit statements such as "cool" or "boring."

Though, the article also state that better methods are needed to test enjoyable aspects because some people have expressed opinions that they do not want fun, entertainment elements in the interface but at the same time they express positive body language like facial expressions when they see something more amusing.

Chapter 3

Design Process

The time distribution of the design process is shown in figure 3.1 and consisted of four different phases:

- Investigation Phase
- Conceptual Design Phase
- Development Phase
- Implementation Phase

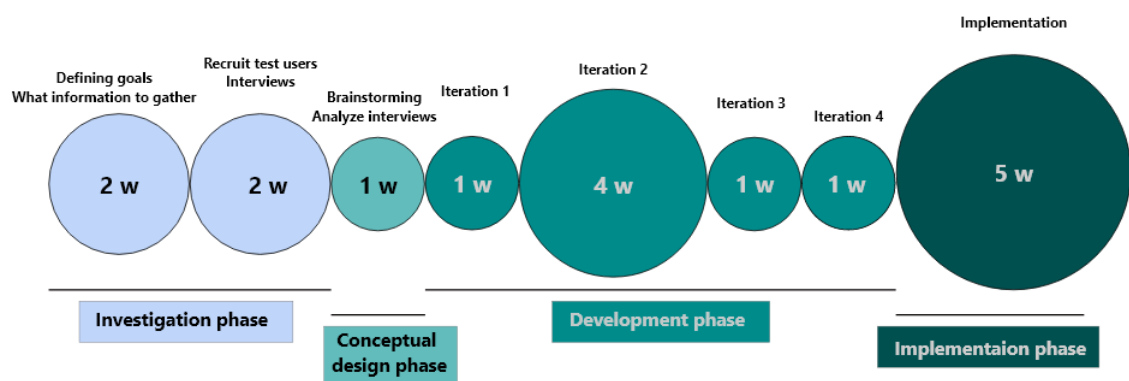


Figure 3.1: The time distribution of the design process.

3.1 Investigation Phase

In the investigation phase, data was gathered to be able to establish requirements and the users' needs. Literature studies and exploring of similar products were made to see what has

already been investigated and developed within the area. Meetings were held to get an in-depth understanding of the problematic and the need for the product. After identifying the users, interviews were designed and held to investigate what the users want and their needs.

3.2 Conceptual Design Phase

The conceptual design phase started with a brainstorming session to generate ideas and requirements to take into consideration in further development. After generating a lot of ideas, the gathered data was prioritized to be able to present conclusions from the results and because the project needed to be narrowed down. All important results from the gathered data are summarized and presented in this section.

3.3 Development Phase

The development phase consisted of four iterations, the first iteration started with a short Lo-Fi phase where different evaluation suggestions were sketched on paper. The different designs were prioritized by dot-voting to decide which suggestions to further develop. For each design, test users were asked if they would understand how to perform the evaluation. Since the prototypes were more focused on testing different ways of interaction and animations, the main focus was on the Hi-Fi phase rather than the Lo-Fi phase. The first iteration is described in detail in section 6.1.

The test setup and performance of each test are described in detail in chapter six.

The second iteration was a Hi-Fi phase where different variants of the same design suggestion were developed with different icons and styles. These were tested and evaluated to improve the prototypes in the next iteration. The prototypes were designed with different color combinations in the third iteration and the designs were tested and evaluated for further development in the fourth iteration. The fourth iteration focused on the whole user flow, e.g. receiving the notification with an evaluation that is to be answered, how the rating scales should be integrated in the phone's screen, how the answer to the question should be sent and how the user can exit certain views. The different iterations are further explained in section 6.2, 6.3 and 6.4.

The Hi-Fi prototypes were developed in Adobe XD since it is a program where you can design and also simulate some limited functionalities. Icons 4 Design plug in were used for icons.

3.4 Implementation Phase

In the implementation phase most of the design decisions have been made. This phase focused on implementing the rating scale designs for a mobile application using React Native for Android, a framework for building native apps [18]. Three implemented prototypes were also evaluated by testing usability and satisfaction with test users. The implementation phase is described in detail in chapter 7.

Chapter 4

Investigation Phase

4.1 Similar Products

There are several applications being used in the hotel industry. Hotel booking sites such as hotels.com and booking.com is very common. With these applications users can compare different hotel alternatives including prices, pictures and room information etc. [13].

Some hotel companies have their own mobile application. One example is InterContinental Hotels Group that have an app where the guest can book stays, check out from the mobile device, receive discounts and offers etc. [12]. Hotel Lundia in Lund also has their own application that, except from earlier mentioned functionalities, can unlock the door with the mobile device [17].

There are also mobile applications that are some kind of mix between the two types of applications mentioned where you can browse different hotels and also use it during your stay. One example is Porter & Sail that also supports functionalities such as a chat and customized recommendations [25].

Bookboost is another type of application that provides hotel websites with a live-chat or provides hotels to integrate different communication channels into one gathered inbox [5].

&Frankly [8] is a tool to measure engagement at the workplace that has fun and innovative evaluation forms. &Frankly is an international group of experts, developers, designers, marketers and sellers that strives to build the best tool to encourage engagement and positive evaluation. These evaluation forms will be inspiration while designing rating scales later in this project.

It seems like none of the applications mentioned above is providing any kind of evaluations

during a hotel stay which makes this project unique.

4.2 Plan what Data to Gather

Literature studies were made to set up goals and plan what information to gather. To gather as much information as possible, two different point of views of a hotel stay will be considered, the hotel staff and the hotel guests.

4.2.1 Design Interviews

Both hotel employees and hotel guests were interviewed. Two different interviews were designed to gather the most suitable information. A technique for finding out what users do, their needs, what they like and dislike is by asking questions during interviews [23]. To have conversations with hotel staff and by asking questions it could provide a deeper understanding about the organisation and the current workflow, and they have a more in-depth understanding of what is needed in the industry. Interviews with hotel guests could provide information about their personal needs and wishes during a stay.

Hotel Staff

When designing the interviews for hotel employees, the focus was to learn how they are working with customer satisfaction, what they believe are important factors to make the guests answer evaluations and their thoughts about an application that can be used to measure the guests satisfaction during a guest's stay. It was also investigated what information is important for the hotel, what typical concerns the guests usually have and what time the employees would estimate to be a good time for the guests to answer evaluations. The interviews were about 40 minutes long and the people that were interviewed are explained in section 4.3. The interviewee was first told to describe its role at the hotel and then the following questions were asked during the interview:

Customer service

- How do you work with customer service to make the experience welcoming and personal?
- What kind of communication do you have before/during/after a guest's stay?
- What do you think is important factors to make a guest pleased with their stay?

Complaints, feedback and the process

- What is the typical complaints that hotel guests usually express?
- How do they usually express their opinions?
- What options do hotel guests have to express their opinion?
- Can you estimate how many of your guests express some kind of feedback or complaints?

- How do you give feedback to those guests who has expressed complaints?
- Do you think there are many complaints that are never heard?
- What do you think can be made to make people pass that information to the hotel?

An Application

- Do you have any application that you are using?
- What kind of functions does it have and is it appreciated?
- What kind of functions would you want to have in an app used by hotel guests?
- What do you think is important when measuring the guest satisfaction in an application?
- Is there any specific moment when you would want to know if the guest is pleased during their stay?
- Would you appreciate a function where guests can present complaints or feedback?
- Would you find it useful to know a guest's well-being several times during their stay?
- Do you think a guest's stay can be improved with such functionality in an application?

Hotel Guests

When designing the interviews for potential hotel guests, the focus was to understand their thoughts and needs for evaluating their stay, what time would be suitable for answering evaluations and if there are moments that is absolutely not suitable to receive evaluations. It was also investigated how their reactions were to notifications with evaluation questions described as different scenarios and also if they have any previous experience regarding evaluating any hotel visits. The interviews were about 30 minutes long and the people that were interviewed are explained in section 4.3. The following questions were asked during the interview:

Typical day on a vacation and when the guest is most satisfied

- You are on a vacation and are staying at a luxury hotel with a pool. The hotel is located in a village close to the beach. How would a typical day look like, what would you do?
- When would you be most harmonic and satisfied with your being?
- When would it be highest risk of being stressed and in-harmonic?

What makes a stay good/bad and when is the guest most satisfied with their being

- What factors makes you extra pleased with a stay?
- What factors makes you extra disgruntled with a stay?

- Do you often present complaints, questions or credit to the hotel staff? When and how do you usually present your thoughts in that case?
- How would you have preferred to present complaints, questions or credit?

Different scenarios

The following scenarios were described during the interview to see if there are some specific scenarios that are more appreciated than others and to possibly see some patterns in what potential users find caring or intrusive.

Scenario 1

You have recently landed, the flight was one hour delayed. You are at the airport waiting for your luggage before going to the hotel. You are sweaty and it is warm outside, you want to go to the hotel and jump into the pool. You are annoyed but also excited for the holiday. You get a notification with the message "Hello *name*, did the trip go well? We look forward to receiving you!"

- How would your reaction have been to a notification like this?
- Would you have answered?

Scenario 2

You are eating breakfast buffet at the hotel, everything is good and fresh but you are not happy with the coffee and you would have appreciated fried eggs for breakfast since you have paid much money to stay there.

- Would you have expressed your opinion?
- How? / Why not?
- Is there any other way you would have wanted to present your opinion?

If you would have gotten a notification on your phone after the breakfast saying: "Hello *name*, I hope everything is well. Did the breakfast taste good?"

- Would you have wanted to answer this message?
- Would you have presented your opinion?

Scenario 3

You are back at the hotel after spending the day at the beach, you are sweaty, it is sand everywhere and just want to take a shower. You get a notification saying "Good evening *name*, I hope all is well! How was the cleaning in your room today?" and see a five-star rating scale.

- What would you feel about a notification like that?
- Would you have wanted to answer this message?

Scenario 4

You are back at the hotel after spending the day at the beach and you are going out for dinner later but you are starting to get hungry. You are ordering room service. Five minutes after the order has arrived to your room you get a notification saying "How was the order? together with a five-star rating scale."

- What would you feel about a notification like that?
- Would you have wanted to answer this message?

Scenario 5

You just landed back in Sweden again and you are looking forward to coming home. You get a notification saying “Hello *name*, I hope the trip home went well. How do you feel about your stay at *Sunny resort*?”

- What would you feel about a notification like that?

To understand when a guest wants to answer evaluations and how it should be designed.

- If you could review your stay similar to these scenarios, when do you think it would be a good moment to answer an evaluation and when do you think it would be a bad moment?
- How would you prefer an evaluation to be designed to encourage you to answer?
- How would you have wanted to get information about the evaluations? As a notification, a pop-up when the app is being used or you have to find the evaluations on your own somewhere in the app.
- How many notifications per day do you think is reasonable before it gets annoying?

4.3 Recruitment of People to Interview

With the amount of time that was scheduled for interviews and the accessibility of relevant people, there was a total of six interviews with potential hotel guests and five interviews with hotel staff (one of the hotels had two interviewees). Ten people were interviewed in person and two people were interviewed through Google meet. Notes were taken during the interviews and they were also audio recorded if consent was given.

Six hotels in south of Sweden with a good reputation and good reviews were contacted through email and asked for an interview. Some of them were modern hotels, some more traditional and some SPA hotels where the guests are indeed there for the hotel experience. Five of the hotels responded that evaluations and guest satisfaction is very important and were very interested and positive to participating. The employees that were interviewed were between 30-50 years old, three females and three males and they had titles such as General Manager or Service Manager so that they would have a good understanding about how the hotel is working with guest hospitality and making sure the guests are satisfied.

The potential hotel guests that were interviewed were of in the age between 25-47 years old, one female and five males. Everyone were used to using technology in the everyday life, liked to travel and to stay at nice hotels.

4.4 Results

4.4.1 Hotel Staff

All of the employees that were interviewed were positive to use an app to evaluate a guest's stay and no one was using an app with similar functionalities. However, they were unsure of how and when to measure it without being intrusive and keeping integrity but at the same time being personal. By being personal some interviewees thought they can exceed the guest's expectations and it is very important to not send information that is perceived as spam.

Almost all of the hotels that were interviewed send information one week before the stay and an evaluation form after the stay. They have a dialogue with the guests during the visit and at check-in/check-out, but no one has evaluation forms to be answered while the guests are still at the hotel. However, they all agree that it would be useful to know how the guests feel continuously during their stay and that the stay could be improved by knowing this. One of the interviewees stated that the main goal is to never let an unsatisfied guest out of the hotel and that it is three times more expensive to compensate a customer afterwards rather than compensating them on-site.

Guests complain about many different things, many complaints are about the room, such as the size of it, the temperature, the view, something is missing or that it is noisy. Other common complaints are about the service or the food. This information is useful when developing the evaluations to know what to ask about and what the expected answers might be. From the interviews it is clear that it is valuable to ask questions about one hour after the guest has checked-in to confirm that the room is good, after an order or service and after a visit to the restaurant.

In general it is about 20-30% of the guests who answer the evaluation form that is sent after the stay. This is an interesting number to compare with the response rate of evaluations in a mobile application to see if the percentage is less or more. Many of the interviewees said that the ones giving feedback is often either very happy or very unhappy with their stay and they also believed that there are complaints that is never heard. It is therefore desired to have a solution that communicates with the guest to receive feedback from the ones that are not used to giving feedback. An application that sends evaluation questions could be a solution to receive those complains, which can lead to compensation and less number of bad reviews.

There were different opinions about a chat where guests could write directly to the reception, the staff were overall very positive but some considered it being a question about resources since they believed they needed more staff to manage a chat.

4.4.2 Hotel Guests

The users that were interviewed had very varied opinions about the different scenarios. Some could find the notifications in the scenarios irritating while some found it informational and useful. Despite the varying opinions it was clear similarities regarding how a typical day looks

like for different types of people. Common to all was that after breakfast they have some activity, then it is lunch and after lunch it is some activity again and then they go to the hotel before dinner. Almost all people being interviewed agreed on that they were most calm and satisfied during the evening and would like to answer evaluations at that point. Before lunch was clearly the worst time to answer evaluations.

Many of the interviewees want to get notifications when they should evaluate something rather than making an effort to find the evaluation by themselves. However they all agree that it should be easy to answer and with one or as few clicks as possible, they want maximum 1-2 notifications per day. They all agree that a chat would be an easy way to contact the staff, however they expect a fast reply when using a chat.

Many of the interviewees express their complaints to the receptionist, however several said it would be easier to express complaints through an application.

From the interviews there were some important aspects to think of when developing the application:

- It should be simple to answer the evaluation questions
- It should be optional to add more detailed feedback
- It should be fun/exciting
- A compensation for answering the evaluation would be appreciated
- Preferably only one page, should be able to see how long it is.
- Maximum 1-2 notifications per day

These items will be taken into consideration when developing the application, however the compensation is something that has to be decided for each hotel.

Chapter 5

Conceptual Design Phase

5.1 Brainstorming

A brainstorming session was held together with the UX-team and the Head of Innovation at Tactel to generate ideas. These people were chosen since they have more experience of UX and are often involved in early stages of a project. The results from the interviews were presented and thereafter some discussion points regarding when, what and how to evaluate a guest's hotel experience.

It was a total of 15 people during the brainstorming session and it was about 30 minutes long. From the brainstorming session, some important aspects were found.

- The first question or notification should be very easy to evaluate, maybe just a thumb up or down and then the next questions can be a bit more complex
- It feels personal to follow up earlier questions e.g. "We are happy that you liked the room ..." or if someone did not like something it could be asked about again
- Nice to have information together with a question so the user also get something out of it
- To ask about breakfast, either it could be tracked in some way to know when someone has been there or it could be sent 5 minutes after breakfast closing time
- The receptionist could present themselves in the app or in a text message and encourage the guests to talk to them to get a personal touch
- Many appreciate fun and colourful evaluation forms

5.2 Narrowing Project Scope

When all of the data had been gathered, the project needed to be narrowed down. A chat system will not be taken into consideration because some hotels believe it is hard for the staff to have time to answer messages as fast as the guest expects, also a lot of different well-designed chat systems already exists. What information to have together with an evaluation question and how to personalize the language is individual for each hotel and will not be taken into consideration. How to follow up earlier questions can be further investigated when an application is implemented.

The project will focus on different notifications with information and evaluation questions. The focus include when the notifications should be sent, what it would ask and how the evaluation forms would be designed.

5.3 Analyze Results from Interviews

By using an affinity diagram, all data from the interviews were organized and the answers or opinions that were related in some way were grouped. By doing this, conclusions about what is important and not that important could be identified. For this project, a typical guest journey and a timeline was designed and also a list of requirements for further development of the product. The result can be seen in section 5.4.

5.3.1 Prioritizing What to Notify

To be able to design a good timeline of when and what type of notifications should be sent, the different types of notifications that has been identified from the data gathered were prioritized 1-3, where 1 is most important and 3 is least important. During prioritization, it was taken into consideration both what are valuable for the hotel and what are valuable factors for the guests.

First priority:

- After check-in, evaluate the room
- After check-out, evaluate the overall experience, as a survey

Second priority:

- Send information before check-in, but only to replace other information sent before arrival and to have some valuable information
- Evaluating after ordering something or after using some service
- Evaluate breakfast
- Evaluate cleaning of the room
- Evaluate some restaurant experience, only important for some hotels

- Evaluate personal service

Third priority:

- Evaluate the check-in process
- Send information to explore new things in the area
- In the morning, evaluate sleeping environment (e.g. noisy/cold)
- Send personal message, only important included with something else

To evaluate the check-in process and the sleeping environment that have third priority, will not be further investigated. Send information to explore new things and send personal messages that also have priority 3 will not be integrated during this project since it is individual for every hotel.

5.4 Conclusions of Conceptual Design Phase

5.4.1 Guest Journey

A typical guest journey is identified in figure 5.1 with basis from the interviews. A typical guest journey is identified with three different phases: before, during and after the stay and all activities during a typical stay is identified with small grey dots and text. During the stay, a typical day for a guest on a vacation in a sunny location is described. In this example it is a stay of seven days and it is assumed that every day looks more or less the same. Except from the activities of each day, check in and entering the room is identified in the beginning of this phase. The green dots represent time slots where it is good to send evaluations or information. Therefore, an example of a bad time to send evaluations and notifications are in the middle of the day when a typical guest is out and doing something. Therefore, all green dots represent times where evaluations could be sent, and this project is mainly focusing on the phase during the stay.

5.4.2 When and What to Evaluate

By combining the priorities from section 5.3.1 together with a typical guest journey, an example of a timeline to display what and when an evaluation notification should take place during a seven day stay at a hotel has been designed. This example is shown in figure 5.2. It is a suggestion of how the notifications can be distributed during a guest's stay if this would be an application in production, this should be customized for each guest. In this example, the guest is visiting the hotel's restaurant on day 4 and is ordering something in the hotel's app in day 5.

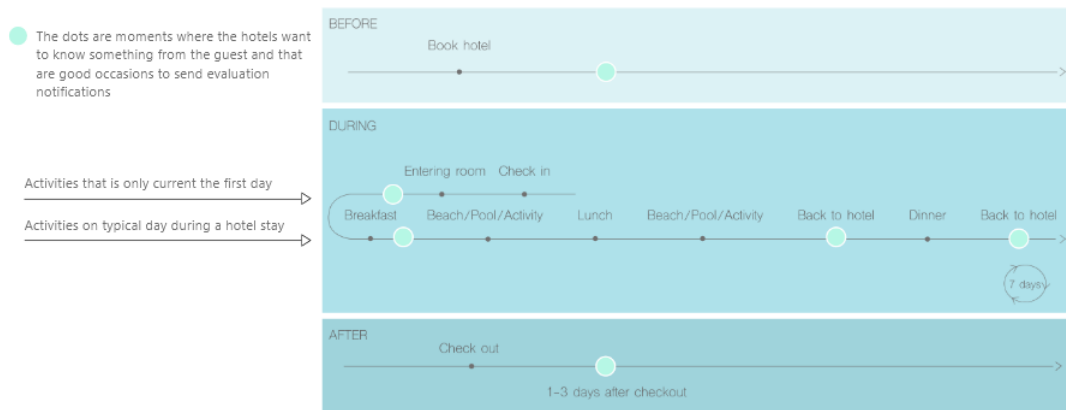


Figure 5.1: A typical guest journey.

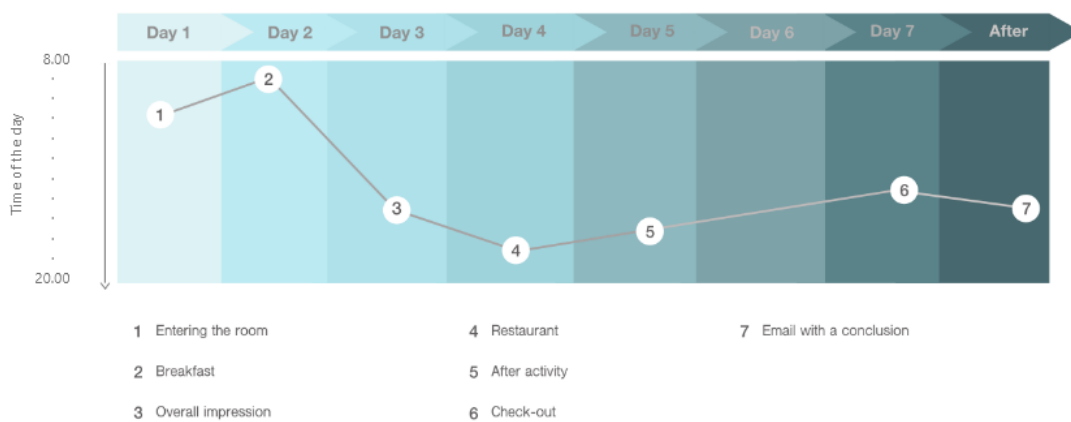


Figure 5.2: Timeline with notifications.

5.4.3 List of Requirements

Following is a list of requirements that was created for further development of the application :

- The evaluations should be designed as notifications with one question each.
- Depending on the guest's answer it is possible to add more information, however it should be optional.
- It should be easy, fun and smooth to answer the evaluations.
- Aim for variety, it makes it more fun.
- During the first day it is acceptable with up to 3 notifications. Otherwise maximum 1-2 notifications per day.
- Aim to be personal but still preserve a guest's integrity.
- If a guest carry out several activities they should not evaluate every activity.

Chapter 6

Development Phase

6.1 First Iteration

The first iteration is a Lo-Fi Prototyping Phase that started with simple sketches of design suggestions on how to perform an evaluation in a fun way. Different design ideas were generated during a brainstorming session with the project team. The different ideas were drawn on a paper and these were later tested by two people from Tactel to make sure that they would understand how to interact with each specific prototype suggestion. By using dot voting with the project team and the two people from Tactel, six prototypes were chosen to be further developed and investigated since all of the ideas would take too much time to develop. This phase were chosen to be short since the final product will focus on short questions to evaluate, that does not involve many buttons or text that needs to be easily understood. A good user experience for this product will mainly focus on the overall feeling of answering an evaluation and therefore it is more suitable with Hi-Fi prototypes to be able to generate smoothness, different ways of interaction and animation effects. The six different types of rating scales that will be continued working on are numbered in figure 6.1 and will be referred to by using the following names during the rest of the thesis.

- **Binary rating scale** (Number 3 and 4), one positive and one negative alternative.
- **Multiple icon rating scale** (Number 6), usually five or ten options to give a grade.
- **Expanding icon rating scale** (Number 7), click on icon to expand it which indicates a higher grade.
- **Rating scale with changing/rotating icons** (Number 2 and 13), drag to change the appearance of the icon.
- **Increasing slider rating scale** (Number 9), drag a slider bar to increase the amount of icons which indicates a higher grade.

- **Describing words rating scale** (Number 15), choosing describing words to give feedback.

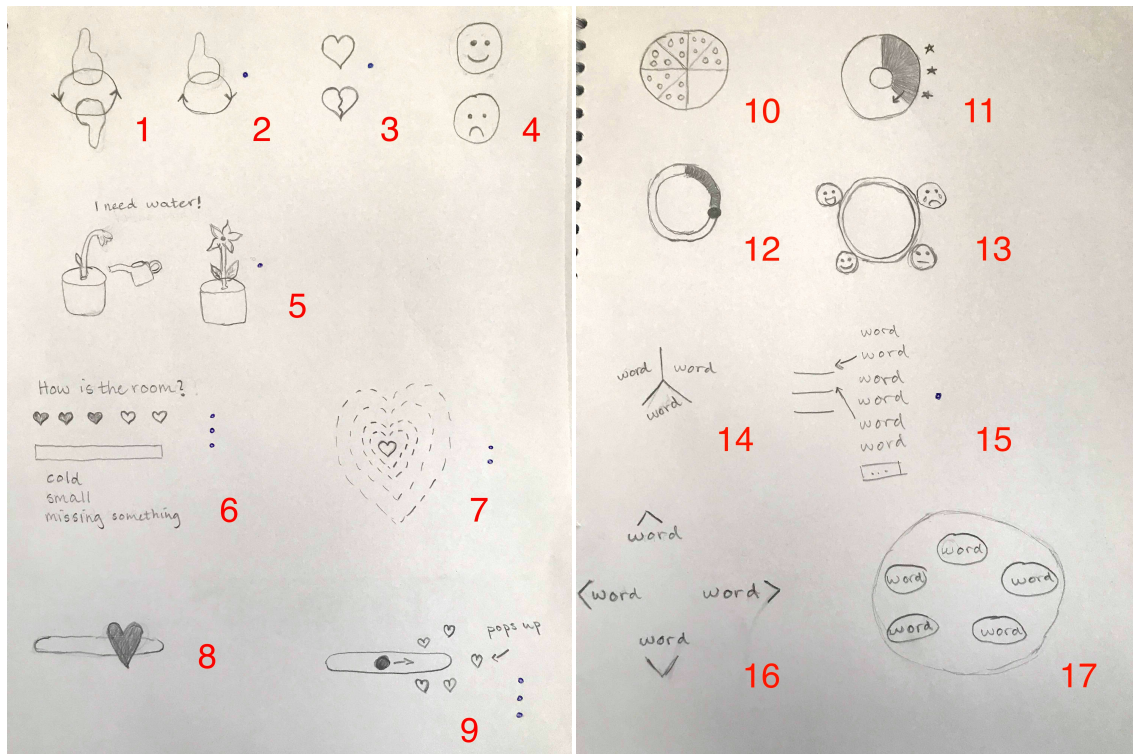


Figure 6.1: First iteration, prototypes 1-17 from brainstorming session.

6.2 Second Iteration

This iteration were mainly focusing on different ways to interact and to perform usability tests with users to see what factors potential users liked and disliked. This phase started with exploring the functionalities in Adobe XD to understand what actions that were possible to simulate. Circular motions were hard to simulate and therefore rating scales with changing or rotating icons was changed to have a slider that controls the appearance of the icons. Thereafter, the basic concepts of the ideas from the Lo-Fi Phase were created and alternatives for each idea were made as for example different types of icons and different placing of fields. The focus during the development phase was to make it fun and provide a good user experience while using it, therefore there were colorful backgrounds and the idea was to make the icons in different color but since the test users should mainly focus on the different ways to evaluate rather than the design, the color of the icons were the same for each type of rating. In later iterations the colors will be taken more into consideration.

6.2.1 Test Setup Second Iteration

The goal were to test the prototypes on 20 people to get a wide range of opinions but due to circumstances in the nation regarding Covid-19, during this time, people were recommended to stay at home. The tests could not be held remote since Adobe XD needed to be installed on the computer or phone, therefore the prototypes were tested on six people. The tests could have been performed via Zoom where the test users could have seen the prototypes and say what they would have done if they had the mobile device in their hand. But this was not carried out since some of the user experience is lost when you do not have the direct interaction with it.

The interviews were divided into different sections where the test users got to see some prototype suggestions that had similar interaction, and thereafter they got to answer some questions regarding what they had just seen. The test users were also told to describe their thoughts and reactions about the different design suggestions. Their body language were observed and answers to the questions and all spontaneous comments were written down.

To compensate for the lack of test users, a survey was created with pictures of the different prototypes with similar questions as the interviews. This quantitative data have been used to motivate design decisions but it was taken into consideration that these people have not test the different ways of interactions.

First Section

In the first section it was evaluated what icon people appreciated the most on a multiple icon rating scale. The test user got to answer which one they liked the most and the least. See figure 6.2.

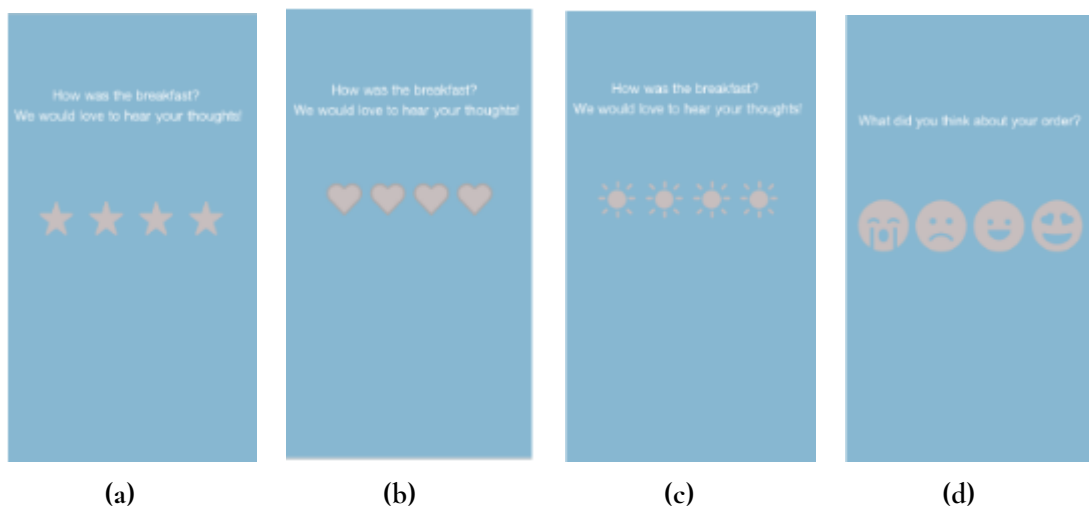


Figure 6.2: Second iteration, prototypes of multiple icon rating scale with different icons.

Second Section

In the second section it was evaluated what scale people appreciated the most on a multiple icon rating scale. The test users got to answer which one they liked the most and the least. See figure 6.3.

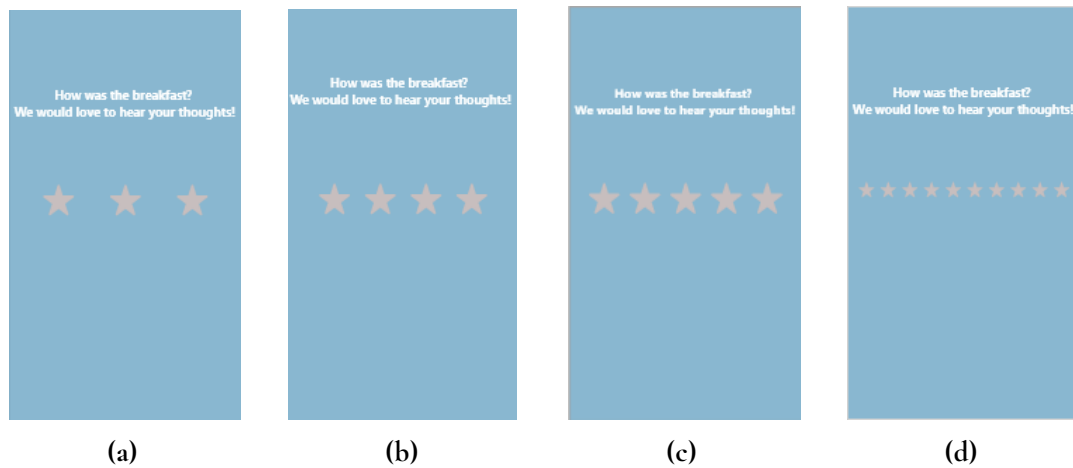


Figure 6.3: Second iteration, prototypes of multiple icon rating scale with different scales.

Third Section

In the third section it was evaluated if people appreciated the ability to choose from additional words that described what could be improved and if they would want an input field to add optional comments, see figure 6.4b. It was also asked if they preferred the icons to be in a darker nuance the higher grade given and if they understood that they did not have to choose any add-ons. See figure 6.4.

Fourth Section

In the fourth section different prototypes with describing words was evaluated. Figure 6.5a-6.5d had different amount of lines for the selected words. Figure 6.5a had three lines with full opacity, the other options had the first line with full opacity and the rest of the lines with some transparency to imply that it was optional to add more words. The test users were asked which design they liked the most and the least and for every example, it was asked how many words they thought they had to choose and if they wanted to be able to write an optional word which was possible in figure 6.5a-6.5e. See all the design suggestions in figure 6.5.

Fifth Section

In the fifth section it was evaluated if people would understand how to rate and which icon they preferred. It was also asked if they wanted to give more input than just selecting a grade from 1-5, for example choose a describing word or an input field when the question "How was your visit at the restaurant?" was asked. The test user also got to answer which icon they liked the most and the least. The different designs are shown in figure 6.6.

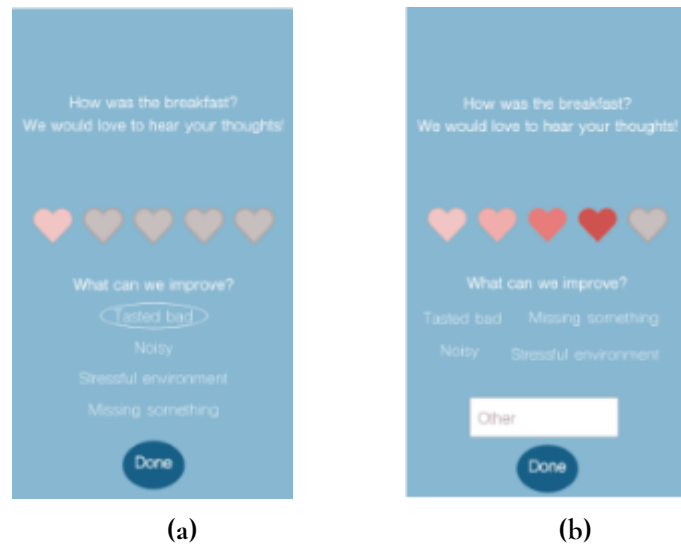


Figure 6.4: Second iteration, prototypes of multiple icon rating scale with additional words and an input box.

Sixth Section

In the sixth section it was evaluated which icon the test users preferred on the increasing slider rating scale. The slider bar had five states where the amount of icons increased the more it was moved to the right. The first state had one icon, second state had two icons etc.. The test user got to answer which icon they liked the most and the least. See the designs in figure 6.7.

Seventh Section

In the seventh section it was evaluated which icon the test users preferred on the rating scale with changing/rotating icons. As mentioned earlier, suggestion number 13 in figure 6.1 was changed to a slider with changing icon due to technical limitations in Adobe XD. The prototypes had three different states where either the icon rotated (figure 6.8a), changed (figure 6.8b) or its amount of icons increased (figure 6.8c, 6.8d and 6.8e). The test user also got to answer which one they liked the most and the least. See the designs in figure 6.8.

Eighth Section

In the eighth section it was evaluated which icon the test users liked the most of the binary rating scales. The designs had one positive and one negative icon to choose between. This could be useful when you do not need much input from the user. The test user got to answer which one they liked the most and the least of the designs in figure 6.9.

Ninth Section

In the ninth section the test users got to answer some final questions regarding if it was easy to know how to rate all the different rating scales and which type of rating they preferred. They got to see all the different design suggestions they had seen during the test and picked



Figure 6.5: Second iteration, prototypes of describing words rating scale.

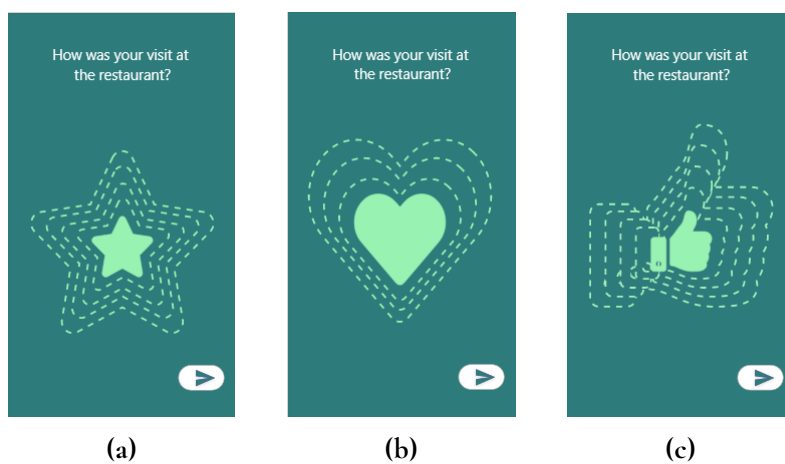


Figure 6.6: Second iteration, prototypes of the expanding rating scale.

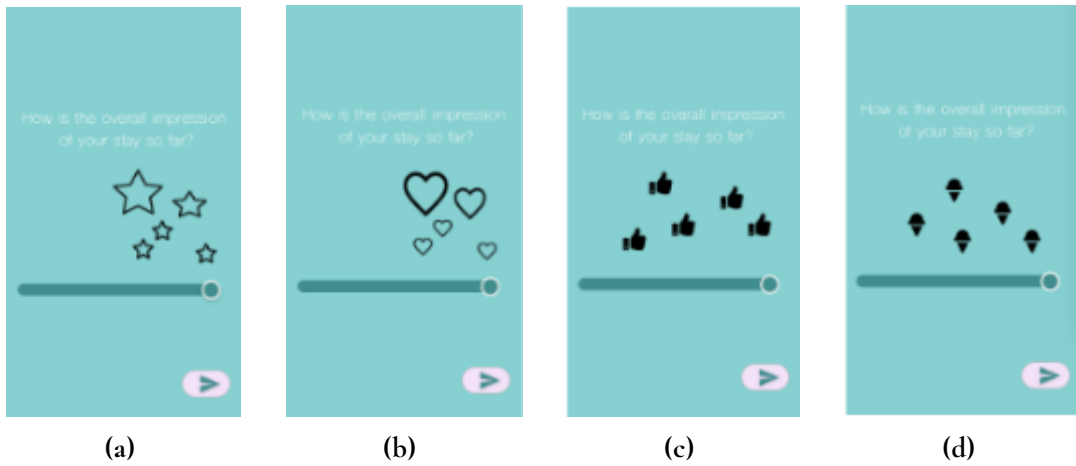


Figure 6.7: Second iteration, prototypes of the fifth state on the increasing slider.

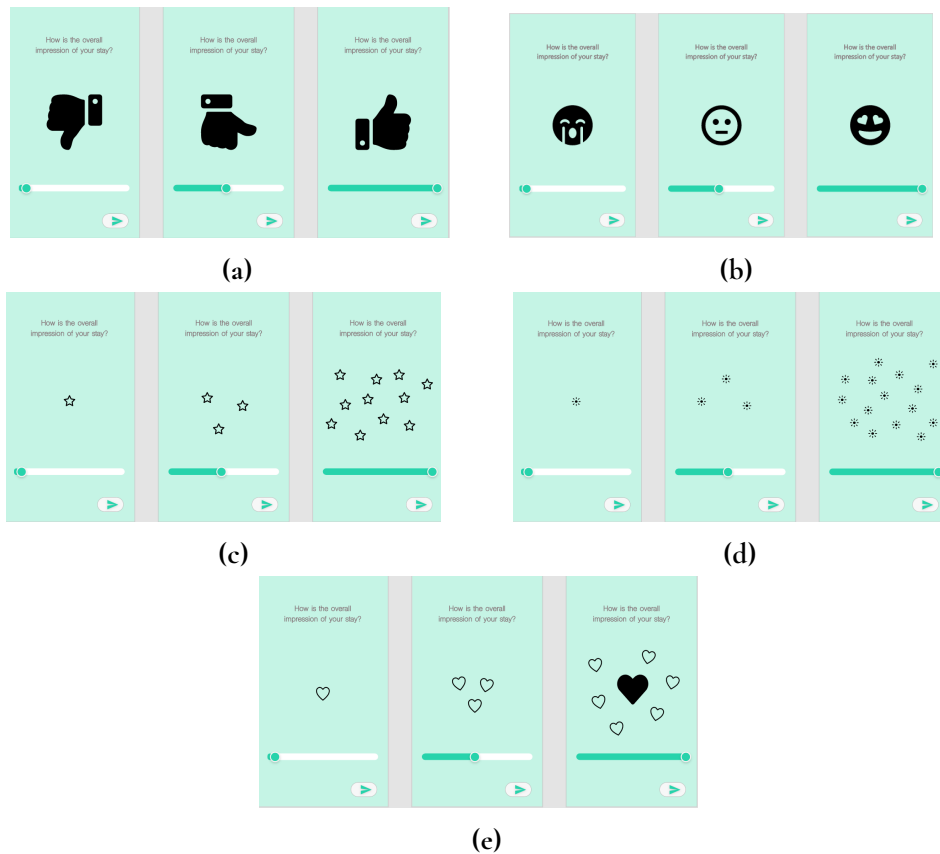


Figure 6.8: Second iteration, prototypes of slider with changing/rotating icon.

their three favorite designs and the three they liked the least. The last question asked was if they had any overall tips or opinions.

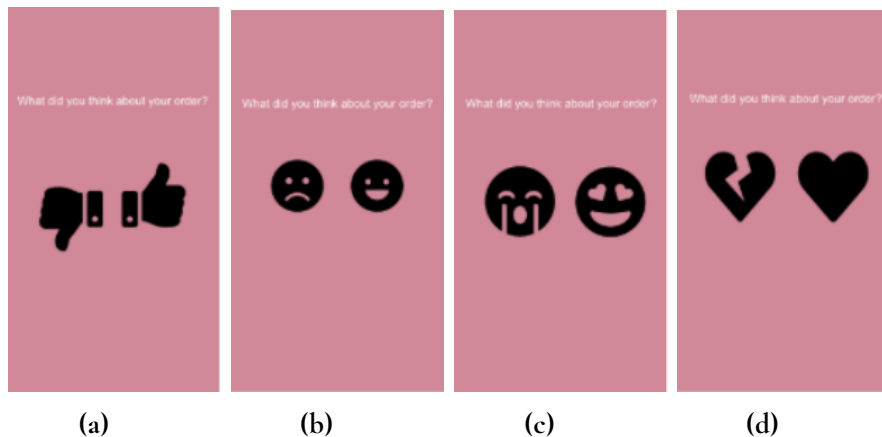


Figure 6.9: Second iteration, prototypes of the binary rating scale.

Survey

A survey was designed to be similar to the test but simplified. It included pictures on every design suggestion and at least one question per section. It was asked which design in each section they preferred and some additional questions. The asked questions are explained together with the results in the section below.

6.2.2 Results Second Iteration

Results from Tests

A total of six people tested the design suggestions, two males and four females. Four of them were between 25 and 30 years old and two people were between 60 and 65 years old.

First Section

The overall feedback was positive to all of the designs. 5 out of 6 liked either the star icons (figure 6.2a) or the heart icons (figure 6.2b) the most.

Second Section

The test users all agreed that the multiple icon rating scale should have five states, i.e. figure 6.3c.

Third Section

6 out of 6 liked that the hearts had a darker nuance for higher grades and all of the test users wanted an optional text field. Most of them liked the additional words to add more information. Some of the test users were unsure if they would have understood that it was optional to add some additional information, an option that says "no opinion" could be a good solution.

Fourth Section

All the test users wanted to be able to add 3-4 different words and to have an optional text field. The designs with words aligned to the right and an increasing amount of lines were the two top choices, see figure 6.5b and 6.5c. The users disliked figure 6.5f, 6.5g and 6.5e. They

preferred when some lines were a bit transparent because it was more comprehensible that they did not have to choose as many words as lines. Some commented that the lines could pop up when a word was chosen to clarify that you do not have to choose any word at all.

Fifth Section

Many of the test users thought the expanding icon rating scale was nice and intuitive. Most of them liked the star icon the most (figure 6.6a) and the thumb icon was most disliked (figure 6.6c). Some of the test users thought they could use pinch to zoom to expand the icon but they soon understood that they could tap on the icon or on the lines to make it bigger. Some of them wanted to be able to add an optional comment.

Sixth Section

The test users liked the star (figure 6.7a), heart (figure 6.7b) and thumb (figure 6.7c) icons on the increasing amount of icons rating scale. The ice cream icons (figure 6.7d) were most disliked. The slider started on the fourth state (out of five) during the test, many test users commented that it should start on the first state (when the slider bar is not filled at all) or in the middle. Some said it can be a bit unclear if it starts on the first state and it is already an icon on it, and if that should be seen as good or bad.

Seventh Section

The test users were all positive and liked the rotating thumb (figure 6.8a) but disliked the sun icon (figure 6.8d) on the slider with rotating/changing/increasing icon rating scale. Several people expressed it was too big gaps between the different states and wanted to have more number of states. The slider bar where the amount of icons increases in the sixth section (see figure 6.7) were more appreciated than the ones in this section (figure 6.8).

Eighth Section

The thumb icon (figure 6.9a) was most appreciated on the binary rating scale. The crying smiley/smiley with heart shaped eyes (figure 6.9c) and the heart/broken heart (figure 6.9d) was disliked the most. Several people said they wanted more alternatives since it can be too categorical, but it was good with an optional text field to add more information.

Ninth Section

All of the test users thought it was easy to use the different types of rating scales, the expanding rating scale was the most difficult one but everyone learned how to use it within a few seconds. The favorite prototypes were the multiple icon rating scale with the star icons, five states, additional words and an input field (A combination of figure 6.3c and figure 6.4b). Other favorites were the slider bar with the rotating thumb but with five states (figure 6.8a), the design with describing words aligned to the right (figure 6.5a), the expanding star icon (figure 6.6a) and the slider bar with five states and an increasing amount of star icons (figure 6.7a).

Some extra comments expressed by the test users were that variation is appreciated, it was nice colors and that it could be some discount or treat to answer the evaluations. From observations it is seen that test users can express feelings such as smiling or comments "oh that is nice" regarding more odd icons such as ice creams and sun icons but these are still the ones

that are least popular.

Results from Survey

A total of 35 people answered the survey, both people from Tactel and students from Lund University. 55% were males and 45% females with varying ages between 21 and 51 years old.

First Section

It was asked which icon was preferred on the multiple icon rating scale, 68,6% preferred the star icon. See figure 6.10 for result.

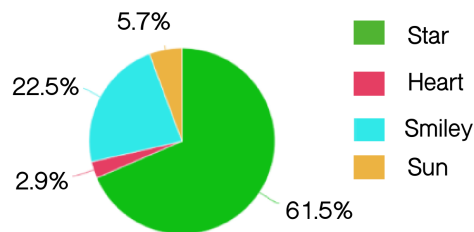


Figure 6.10: Second iteration, survey result of the most preferred icon.

Second Section

It was asked how many possible grades a user should be able to choose between, 77% preferred a scale of 5 grading states. See figure 6.11 for result.

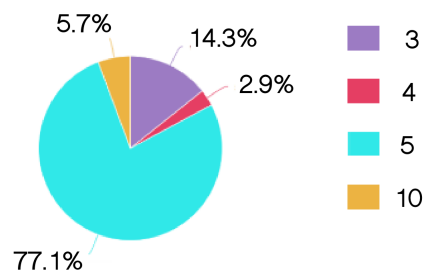


Figure 6.11: Second iteration, survey result of the most preferred number of grading states.

Third Section

It was asked if they appreciated the hearts to be in different nuances (figure 6.4b). It was varying opinions, see figure 6.12 for the results. Some people commented that it is hard for colorblind people to see the different nuances which was taken into consideration. Also, 88,6% was positive to additional words to choose between and 82,9% was positive to an input field as long as it is optional.

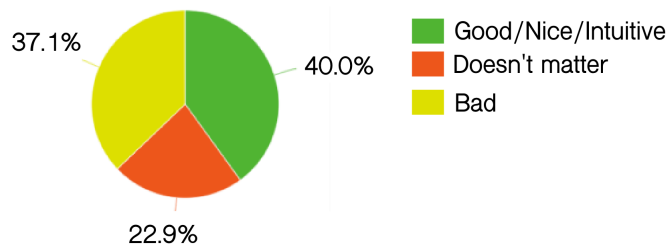


Figure 6.12: Second iteration, survey result if different nuances of colors is preferred.

Fourth Section

Four of the designs from the test session were selected to be used in the survey, based on the results from the test and to vary the designs the most. The designs chosen for the survey can be seen in figure 6.5a, 6.5b, 6.5e and 6.5f, .

The survey results differed from the test results, see the survey result in figure 6.13. The most popular design in the survey was figure 6.5g which was disliked by several persons during the test session. And the second most popular design in the survey was figure 6.5e which some persons disliked in the test session. The design with additional words in one or two columns to the right were most popular during the test session, however it was the least popular design in the survey.

71,4% said they wanted an optional text field and they also got to answer how many words they wanted to be able to choose in figure 6.5a and 6.5b. The result can be seen in 6.14.

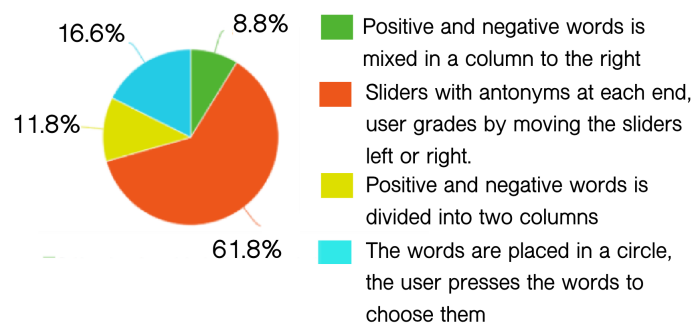


Figure 6.13: Second iteration, survey result of which prototype with describing words is preferred.

Fifth Section

During the fifth section it was asked which icon was preferred for the expanding icon rating scale that can be seen in figure 6.6 which resulted in 44,1% preferred the star and it was quite even between the heart and the thumb. See figure 6.15 for result.

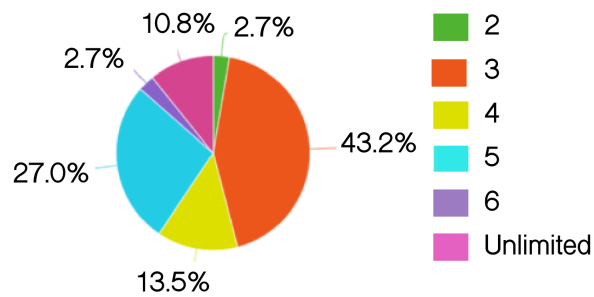


Figure 6.14: Second iteration, survey result of amount of lines.

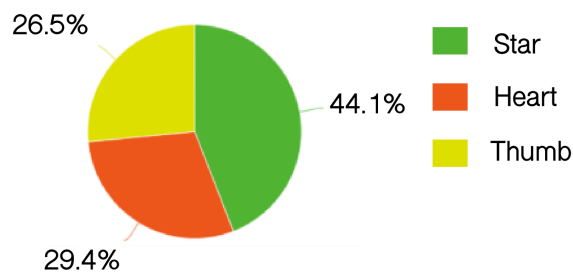


Figure 6.15: Second iteration, survey result of what kind of icon is preferred on the expanding icon design.

Sixth Section

It was asked which icon the users liked the most for the increasing slider rating scale when a higher grade was given. See the design in figure 6.7 and the result in figure 6.16. As shown in the figure, the result was quite even between the star, heart and thumb icon but none liked the ice cream.

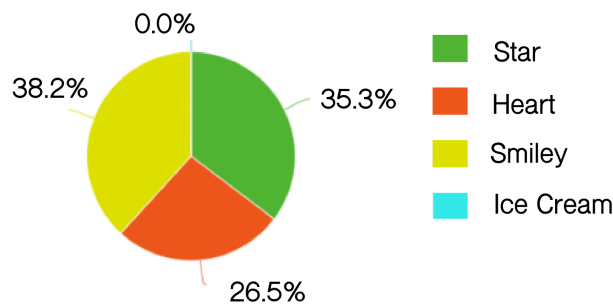


Figure 6.16: Second iteration, survey result of what kind of icon is preferred on the increasing slider.

Seventh Section

During the test session it was noted that the slider with thumb and smiley icon were most popular. Therefore only the thumb and smiley icon were shown in the survey and the test users were asked which one they liked the most. The result was very even with 48.6% liking the smileys and 51.4% liking the thumb.

Eighth Section

In the eighth section, the test users were asked which icon they preferred for the binary rating scale. The smileys and the thumbs got highest rates with 42.9% vs 51.4%. The crying smiley/heart shaped eyes smiley and the heart/broken heart were not appreciated. The result can be seen in figure 6.17.

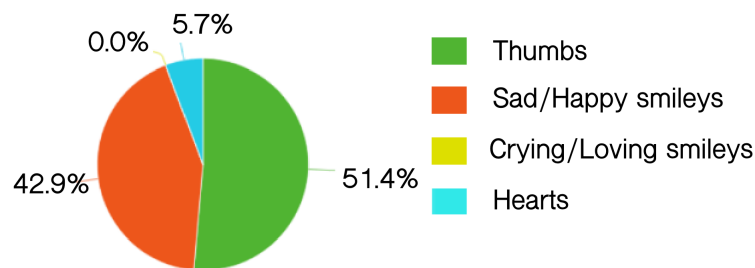


Figure 6.17: Second iteration, survey result of what kind of icon is preferred on the binary rating scale.

Ninth Section

In the ninth section the test users were asked to vote for their favorite rating scale, they had to choose at least one option but could choose how many they liked. The result to this question is shown in figure 6.18 and is very useful for the further process since some favorites will be chosen from this iteration to the next iteration where colors will be tested and evaluated.

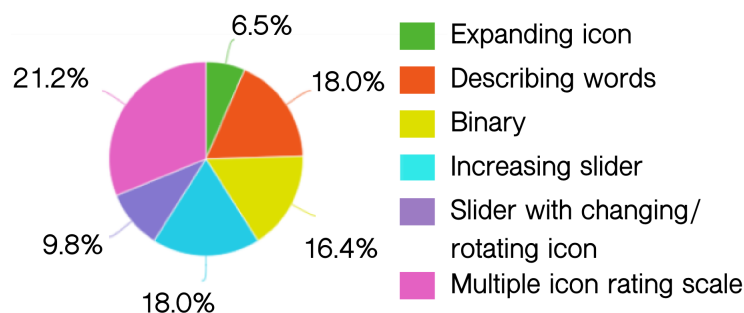


Figure 6.18: Second iteration, survey result of what type of rating scale is preferred.

It was optional to add some extra input in the survey which resulted in some useful comments. See in list below.

- Different nuances on icons can be hard to distinguish for a person with color blindness
- Different questions require different type of evaluations (binary, possibility to add optional input etc.)
- Several people wrote it was fun, colorful evaluations that made them happy
- Good with an introduction that presents earlier actions made from feedback to get the feeling that they really care about my opinion
- Not so detailed icons right now, think about making them playful

6.2.3 Conclusion Second Iteration

Something to have in mind is that the people answering the surveys had not tried the interaction of the designs and that could have impacted what they liked. Therefore the test session will be taken more into consideration than the survey. With the result from both test session and survey in mind, multiple icon rating scale, describing words, increasing slider and slider with changing/rotating icons will be developed further during the next iteration. Since the goal is to have an evaluation with variety, more than these alternatives could be further developed if there was more time.

Multiple Icon Rating Scale

The multiple icon rating scale will be of 5 stars that are colored when the user gives a grade. There will be additional words that the user can choose between to add some extra input, what kind of words will be discussed even further. There will be an optional input field for users to add their own thoughts. The multiple icon rating scale is from now on referred to as *Five star rating scale*.

Describing Words

The describing words will be designed as figure 6.5c. There will be a column to the right with positive words in the beginning and negative words at the bottom. There will be three lines to add words to and if the user uses all three lines there will be one more line added for each word added so the users can add as many words as they like. There will also be an input field for users to add their own words and it will be possible not to answer.

Increasing Slider

The slider will be implemented with the star icon since it was most popular both in the survey and during the test session. The slider will start from the middle because it is a neutral grade and to not confuse the user in some way.

Slider with Changing/Rotating Icon

The slider with changing/rotating icon will be implemented with a rotating thumb since it was most popular both from the survey and the test session, however it will be modified

to have at least five grades since the users have expressed that they want to have additional number of states.

6.3 Third Iteration

The four favorite rating scales from second iteration were focused on during the third iteration. The different designs were modified and combined with the interaction and combinations that were appreciated or commented on during the second iteration. Thereafter different color choices for each design were developed in Adobe XD to be tested on potential users to see what they like and dislike. The designs had different background colors and different colors on the icons.

6.3.1 Test Setup Third Iteration

Since only the colors of the designs were in focus and not the interaction during this iteration, a survey was suitable. It generates more quantitative data in less time than holding test sessions with several people. A survey was therefore created with different color combinations for all the rating scale suggestions that were chosen from second iteration. The survey was structured in sections where each type of rating scale per section had different color combinations. The test users got to choose which designs they liked the most in each section, there was an option to combine their own favorite background with their favorite color of icon. The user could choose several options on each question.

Describing Words

The first type of rating scale was the describing words where the designs had different background colors. Since it was a total of four different types of rating scales where different background colors was combined with icons in different colors, the different background colors needed to be limited. The project group chose 4 different pastel colors to start with. Pastel colors are defined as a soft, tinted shades of a color [6]. According to Fussell [9], pastel colors have an ability to sooth and calm the user and many associate it with summer, joy and optimism. With these associations, it was a good choice of colors for the purpose of these designs. To test this theory, darker colors were included in the survey to see if people appreciate the lighter pastel colors or not. The different background colors were mainly tested on the describing words since the design did not have any icons that could affect the user. The different background colors are shown in figure 6.19.



Figure 6.19: Third iteration, prototypes with different color combinations of the describing words.

Five Star Rating Scale

The second section evaluated different color combinations on the five star rating scale. All background colors had one suggestion with yellow stars since that is the most common color to represent a star and one suggestion with another color. One of these suggestions had a smiley with sunglasses to see if people appreciated something more unique. Some of the suggestions had icons with borders in one additional color to see if that was appreciated. The designs are shown in figure 6.20.



Figure 6.20: Third iteration, prototypes of different color combinations of the multiple icon rating scale.

Increasing Slider

Different color combinations of background and icon colors on the slider with increasing number of icons were evaluated in the second section of the survey. To have an option for the people who did not like colorful evaluations, one of the designs were more neutral (figure

6.21a). Otherwise, four different background colors were combined with two different icon colors each. The designs are shown in figure 6.21.

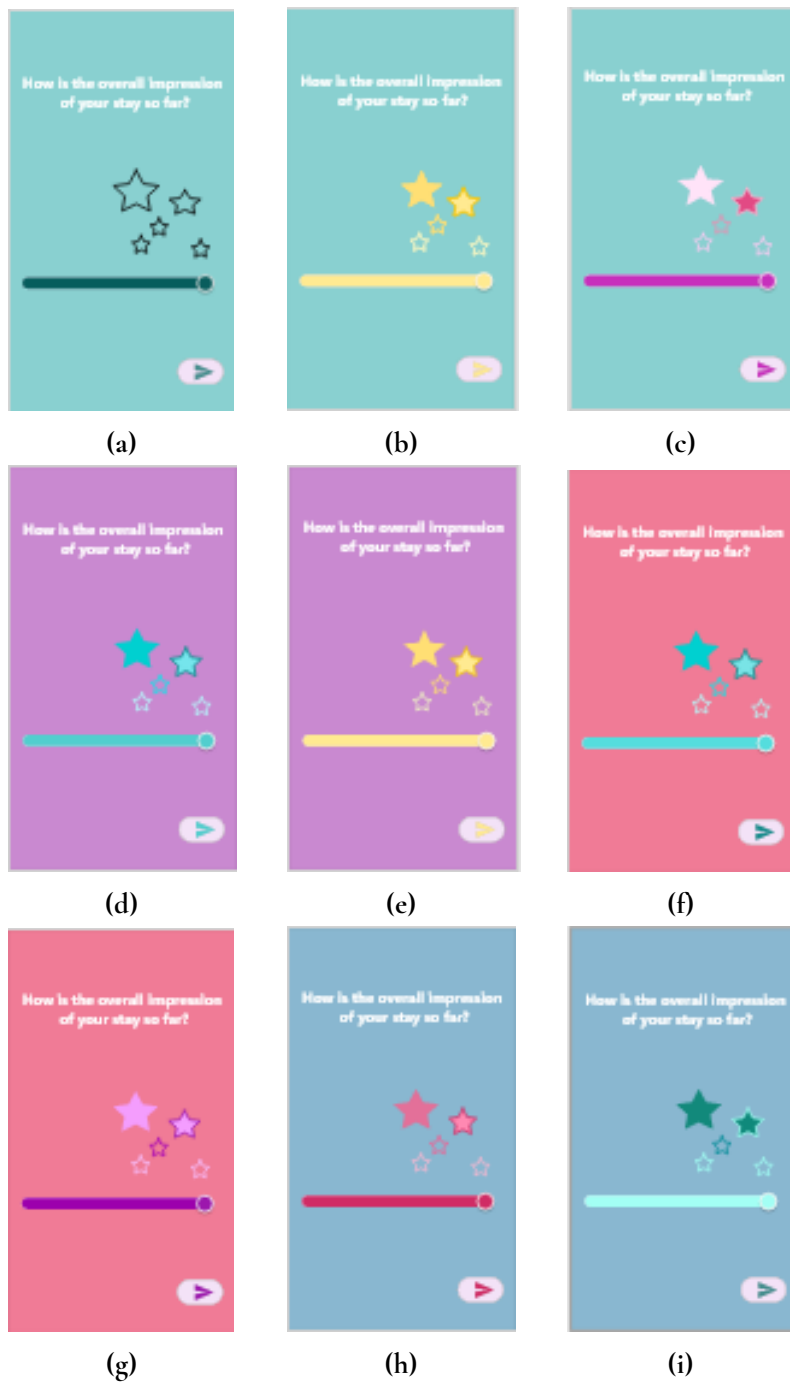


Figure 6.21: Third iteration, prototypes with different background and icon colors of increasing slider.

Rotating Thumb

At last, the rotating thumb was tested with different background colors and different colors on the thumb icon and the slider bar. One of the options were more neutral with a black thumb (figure 6.22c and all backgrounds colors were combined with one green and red thumb since it is common colors to represent thumbs up and down). The background colors were also combined with one other color suggestion each. Some of the suggestions had a border on the icon to see if users apprehended it more clear, the designs are shown in figure 6.22.

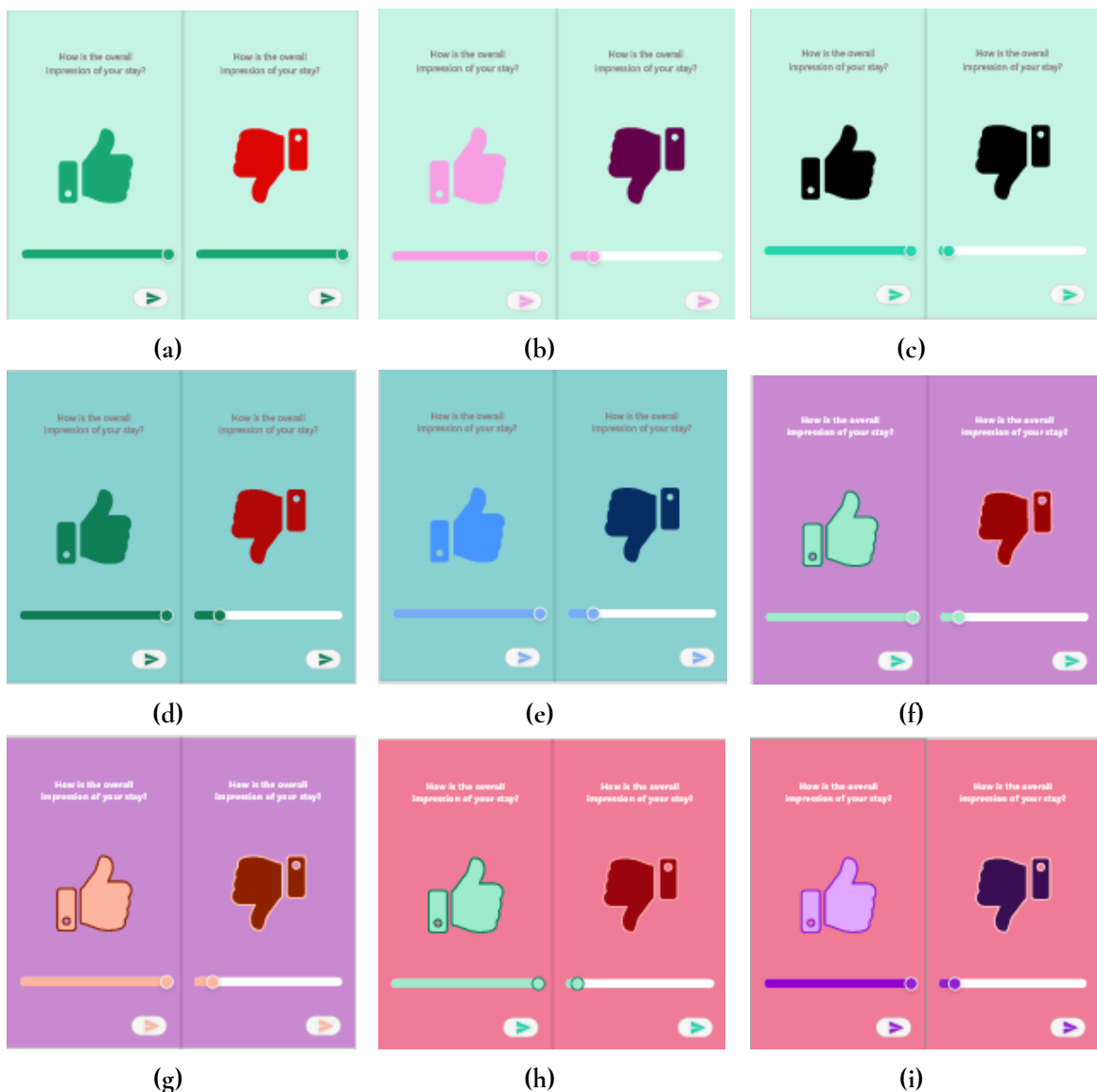


Figure 6.22: Third iteration, prototypes with different color combinations of rotating thumb.

6.3.2 Results from Third Iteration

The survey resulted in 22 answers, 70% females and 30% males. 20 people were between 20 and 29 years old, 1 were between 30-39 and 1 were over 60 years old.

Describing Words

It was clear that the users preferred the pastel colors. The four pastel colors together got a total of 30 votes and the four darker colors got 12 votes in total. The users preferred figure 6.19a and 6.19d the most.

Five Star Rating Scale

The designs with plain yellow stars got the most votes. Figure 6.20a, 6.20c and 7.4d were the most popular designs.

Increasing Slider

Overall the blue and turquoise background got more votes than the pink and purple. The users preferred the most neutral design figure 6.21a and figure 6.21b the most.

Rotating Thumb

The test users liked the blue and green background colors as in the previous section, they also liked the red/green thumbs. Figure 6.22a, 6.22c and 6.22d were the most popular designs.

6.3.3 Conclusion Third Iteration

Overall, the results shows that people prefer designs that they are used to and have seen before, and not with too many colors. Something to have in mind is that they have not tested them in the real environment as the designs are made for, which could affect the result. For further iterations it could therefore be good to test a more neutral option and a more colorful one. The pastel colors where clearly more appreciated than the darker colors.

6.4 Fourth Iteration

The fourth iteration was focusing on the whole user flow which in this case includes receiving the notification with an evaluation that is to be answered, how the rating scales should be integrated in the phone's screen, how the answer to the question should be sent and how the user can exit certain views.

6.4.1 Test Setup Fourth Iteration

For evaluating the user flow, tests and observations with the potential users felt most suitable. The test was performed on eight people. The test users were asked to perform different tasks

and follow up questions were asked for each task. The users actions were observed and noted during the tests. All test cases began with a notification on a locked screen and the user were asked to open the notification. The screen is shown in figure 6.23

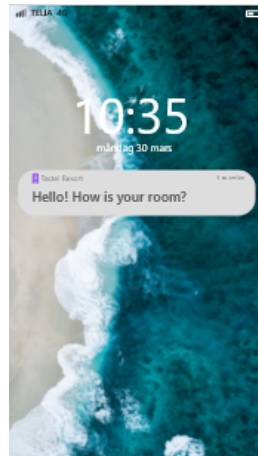


Figure 6.23: Fourth iteration, notification on a locked screen which is shown in the beginning of each test case.

Describing Words

The first part of the test was to show different designs of the describing words. The first design was covering the whole screen with a cross in the upper left corner and a send button aligned to the right at the bottom of the screen (figure 6.5a). The second design covered the whole screen but with a different "Done" button and no cross in the upper left corner (figure 6.24b). The third design covered half of the screen and had some transparency with a cross in the upper left corner and a "Send" button (figure 6.24c). The fourth design covered half of the screen and with a "Send" button and no cross in the upper left corner (figure 6.24d). The users were asked to combine their favorite design with cross, button, transparency and covering of the screen.

Thereafter the users were told to go to the evaluation but not to answer to see how they wanted to exit the evaluation forms. The same task was performed four times on the different designs to see if the users knew how to exit and how they chose to exit from each design when there were several options.

The users were shown the designs in the two most liked colors from the last iteration and were asked which color they preferred of pink and blue. See figure 6.25.

Five Star Rating Scale

Thereafter the five star rating scale design was tested with the two top choice colors on the background and the two top choice colors on the icon from last iteration to investigate what combination that was most preferred. One of the screens had additional words that the user could choose between to describe what could have improved their stay (figure 6.26d). The combinations can be seen in figure 6.26.

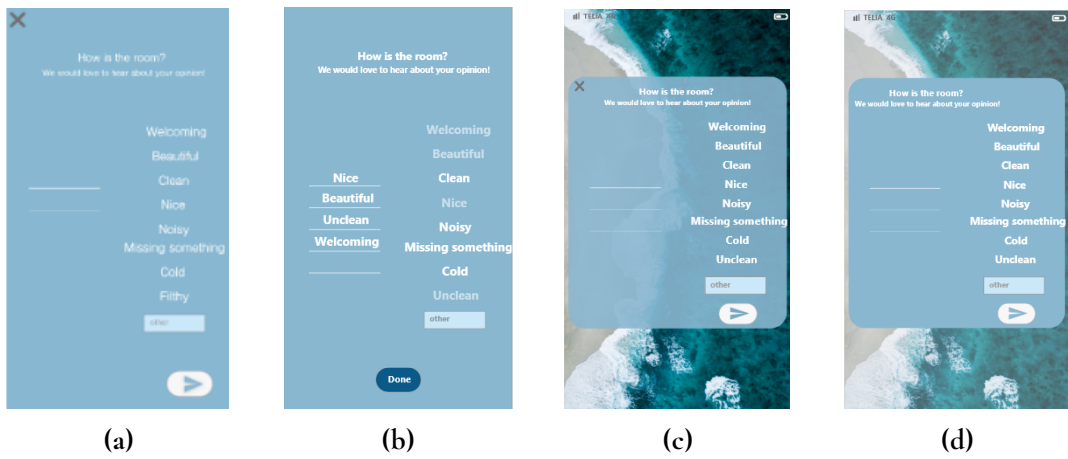


Figure 6.24: Fourth iteration, prototypes of the describing words.

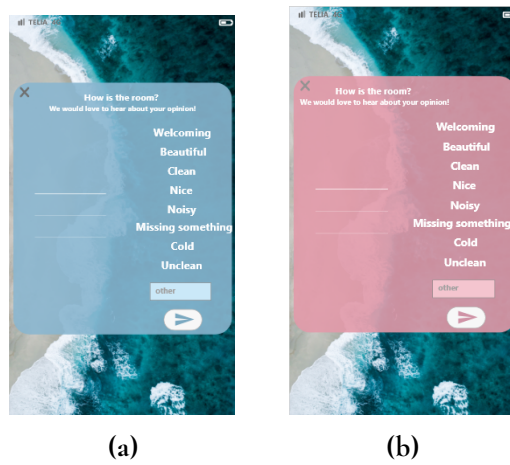


Figure 6.25: Fourth iteration, prototypes of the describing words with different colors.



Figure 6.26: Fourth iteration, prototypes with different color combinations of the five star rating scale.

Increasing Slider

The third part of the test was to test which color of the icons and slider that was most preferred. The users could choose between the two favorites from last iteration, yellow and dark green/black. The prototypes are shown in figure 6.27

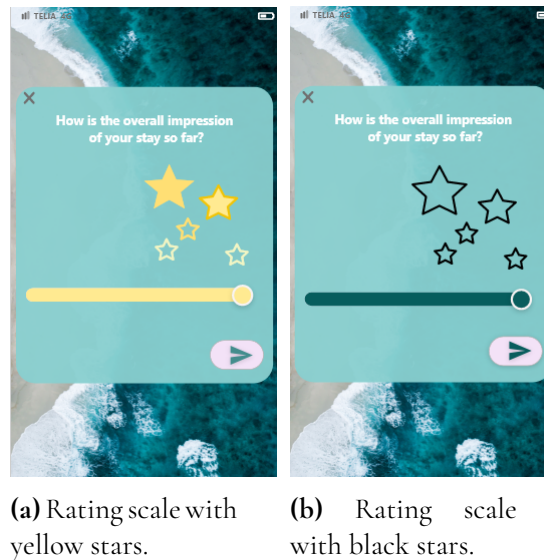


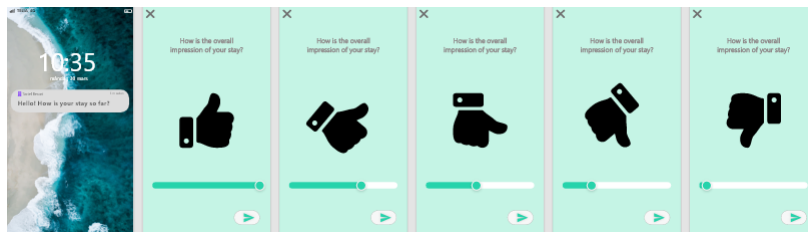
Figure 6.27: Fourth iteration, prototypes with different color combinations of increasing slider.

Rotating Thumb

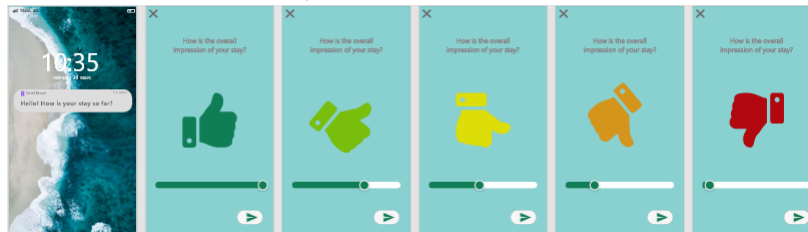
The fourth part of the test was to test what color of the thumb and background was liked the most. The users could choose between the favorite background colors and the favorite icon colors from last iteration. The slider with thumbs can be seen in figure 6.28.

Confirmation Screen

The users were asked which "Thank You" screen they liked the most. There were three options that covered half of the screen, the first one did not have a cross in the upper left corner and disappeared with a timer if the user did not click outside the notification window before the timer went off (figure 6.29a). The second design had fireworks to make it more fun and a cross icon in the upper left corner which made the notification window disappear when being clicked (figure 6.5f) and the third one had a "thank you" message displayed at the bottom of the screen with a cross icon in the upper left corner (figure 6.29c). The fourth design was similar to the third one with a "Thank you" message at the bottom of the screen, however the notification covered the whole screen (figure 6.29d). The fifth design covered the whole screen with a "Thank you" message displayed in the middle with a cross icon in the upper left corner. The sixth design was a simple notification that was supposed to take as little attention as possible from the users (figure 6.29f). The last design was to not get any "Thank you" message at all (figure 6.29g). All the designs can be seen in figure 6.29.



(a) Rotating thumb with a black thumb.



(b) Rotating thumb with a thumb that changes color.

Figure 6.28: Fourth iteration, prototypes of different color combinations of rotating thumb.

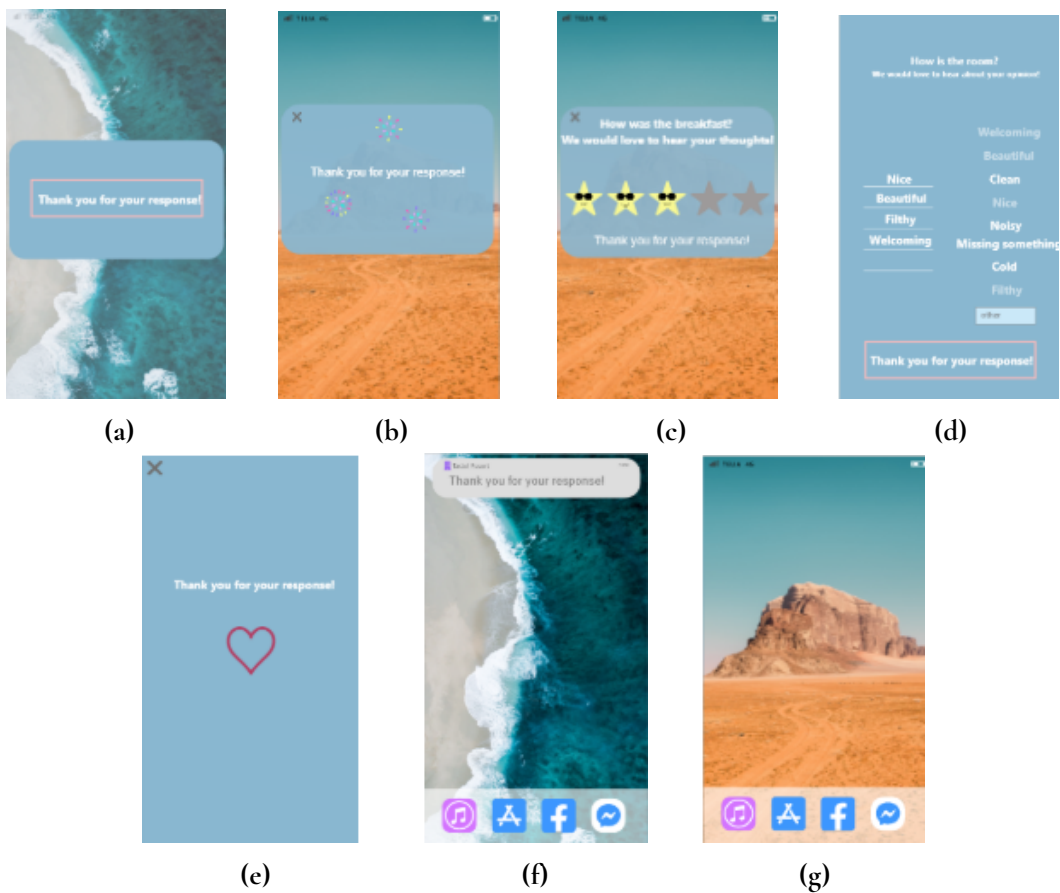


Figure 6.29: Fourth iteration, different designs of confirmation screen.

6.4.2 Results Fourth Iteration

The test users liked many of the designs. It was clear that they liked the notifications that covered half of the screen the most since they thought it was aesthetically appealing and it did not feel as intrusive as the notification that covered the whole screen. People said that the notification that covered half of the screen indicated that it would not take as much time as the other design.

The majority of the test users liked the notification with some transparency and most of them understood how to exit the view by not using the cross if there was an optional way. However some test users did not understand how to exit without a cross in the upper left corner.

The "Send" button was more aesthetically appealing, however the test users preferred a "Done" button since it is easier for an inexperienced user to understand the meaning of the button. The choice of background color was fairly even, many commented that it depends on the background image of the home screen which can not be taken to consideration since all the users might have different background images.

The test users got to choose which color combination they liked the most on the five star rating scale during the second part of the test. The majority liked the yellow stars with no sunglasses the most, however both blue and purple background color was appreciated i.e. figure 6.26a and 6.26c. Some test users expressed that the additional words should be rephrased since they were too harsh and negative as well as the question that ask "what can be improved?" to clarify that the additional words are optional.

The test users' opinions were varying during the third test case but the slider with yellow stars got a few more votes than the one with black stars i.e. figure 6.27a. They commented that it would be nice to have additional words on this rating scale as well.

The test users liked the thumb that changes color from red to green depending on the grade (figure 6.28a) more than the black thumb that does not change color. The black thumb was more popular during the third iteration, however the fourth iteration was more accurate and was taken more to consideration with actual tests and interaction than the third iteration with a survey with pictures of the icons. The test users agreed that the thumb scale should start in the middle to be as neutral as possible. And as for the previous rating scale they would appreciate to have additional words on this rating scale as well.

The users all agreed that they wanted some kind of "Thank you". They liked the figure 6.29b and figure 6.29f with a "Thank you" message and fireworks because they made them happy or a discrete notification because it is not very intrusive.

6.4.3 Conclusion Fourth Iteration

The final prototypes of all rating scales is a combination of all favorite functionalities and colors from the four iterations. The evaluations will cover half of the screen with some transparency. It will have a cross icon in the upper left corner and a "Done" button since most

people will understand that.

The background colors will be different for each rating scale since variation is appreciated to engage the user (result from test session in the second iteration). Both light blue and light pink were appreciated colors in the describing words design, the background color will be light pink to obtain variety. The five star rating scale will have yellow stars with no sunglasses and purple background color. The slider with increasing number of icons will have yellow stars and a light blue background color since that was the most preferred color combination. This will not have additional words to give additional feedback to see again if test users prefer with or without them since it can depend on what type of question being asked. The rotating thumb will change color from red to green depending on the grade with a light blue/green background color. The thumb will start in the middle i.e. at yellow thumb. The "Thank you" message will be shown on half of the screen with fireworks or some kind of fun animation.

These final prototypes will be implemented during the implementation phase using React Native.

Chapter 7

Implementation Phase

7.1 Technology

The final prototypes was implemented in React Native for Android devices using firebase for sending notifications.

7.1.1 React Native

React Native is an open-source, JavaScript framework created by Facebook for writing mobile applications for iOS and Android [18]. It is based on React, which is Facebook's JavaScript library for building user interfaces, but instead of targeting the browser, it targets mobile platforms. It is being used in thousands of apps and is popular since it is fast and you can see your changes directly in the user interface as soon as you save your changes in the code.

7.1.2 Firebase

Firebase is a platform with tools to develop high-quality apps, one of their tools is Firebase Cloud Messaging which can be used to send notification messages to drive user re-engagement and retention [7]. Notifications were created in Firebase and sent to the device by specifying a unique token ID for the device.

7.1.3 Application Architecture

The final application has five implemented screens, a home screen, three screens for three different rating scales and one confirmation screen. The home screen is used to handle the received notification and navigate to the correct screen depending on the notification data. For now, the home screen is not intended to be seen for the user, however in the future

additional functionalities like booking information etc. can be implemented in a menu on the home screen. The confirmation screen has a timer that closes the application after two seconds to minimize the number of clicks needed. One more rating screen with describing words is to be implemented, however it was not done during this project due to lack of time. The notification address the guest by name to give a personal touch.

7.2 Test Setup Final Prototypes

Participants

The final prototypes were tested on nine people, six females and three males. The test users were between 25-65 years old, had experience of travelling and had some basic technical skills. The test took about five minutes to perform excluded the survey.

Setup

The tests were performed on an android device with the installed application. A computer was used to send notifications to the device during the tests and the test users body language and comments were observed and written down.

Procedure

The test users received three notifications with evaluation questions. They got to open the notification and answer the question one at a time. The users were asked to answer the evaluations based on their own experiences from previous hotel stays to make the evaluations as real as possible and avoid to influence their answers. They were given the following scenarios:

You are going to get a notification, think about the last breakfast you had when answering the question. (Figure 7.1)

'How was your breakfast?'

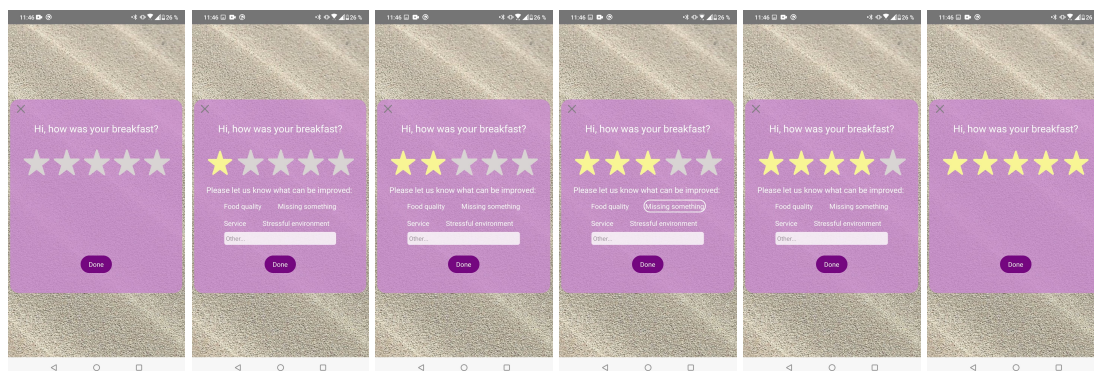


Figure 7.1: The final implementation of the five star rating scale.

You are going to get a notification, think about your last stay at a hotel. (Figure 7.2)
 ‘How is the overall impression of your stay?’

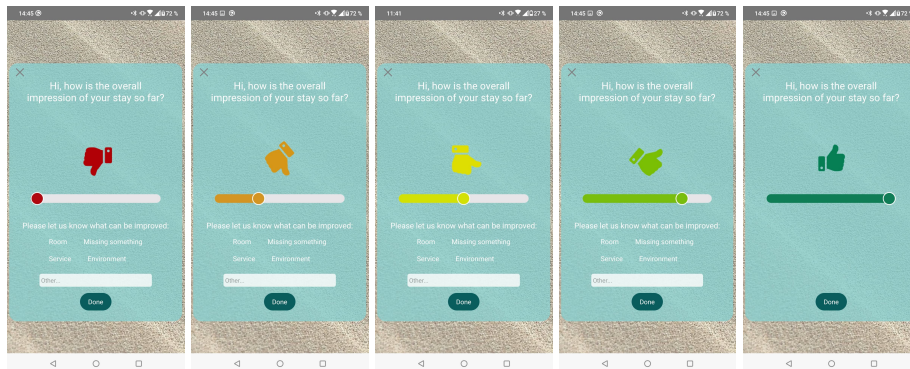


Figure 7.2: The final implementation of the rotating thumb rating scale.

You are going to get a notification, think about your last visit at a restaurant.(Figure 7.3)
 ‘How was your visit at the restaurant?’

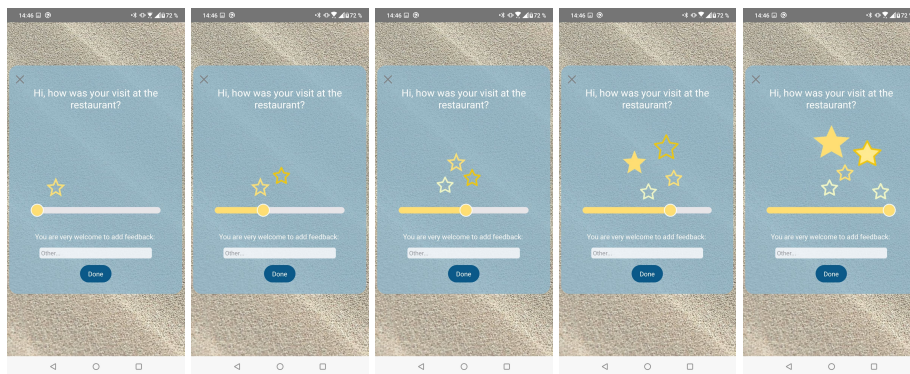


Figure 7.3: The final implementation of the increasing slider rating scale.

After the test they were asked to answer a survey, it had nine statements regarding their experience and mood when performing the evaluations. The questions were inspired by the system usability scale [16] which is a post-test instrument with ten likert-scale questions to validate the usability. The test users graded the statements from 1-10 where 1 was strongly disagree and 10 was strongly agree.

7.3 Results from Final Test

The application was tested on nine people and they were in general very positive to the application. Almost all test users said they appreciate the additional words that can be added. The results for each statement are shown in figure 7.4.

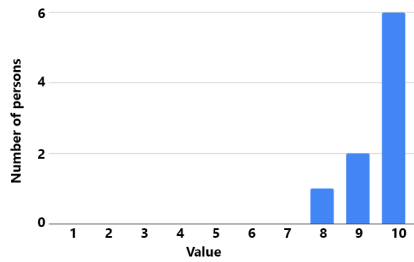
All of the test users thought that it was easy to understand how to perform the evaluations

and strongly disagreed to the evaluation being cumbersome to answer, see statement a) and b) in figure 7.4.

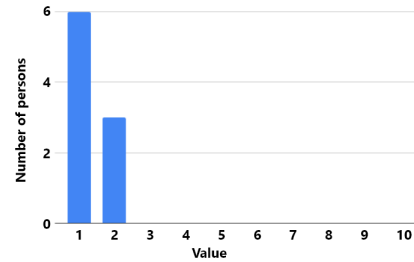
To evaluate how the design affected them, statement c), d), e) and f) were made as shown in figure 7.4. The test users appreciated the design, overall they thought it was aesthetically appealing and not confusing. Statement f) had more varying answers but we believe it is a good value and implies that the test users were positive.

It was also investigated how demanding it was to answer the evaluations by making statement g) and h). The results show that it was not demanding and it felt smooth to perform the evaluations.

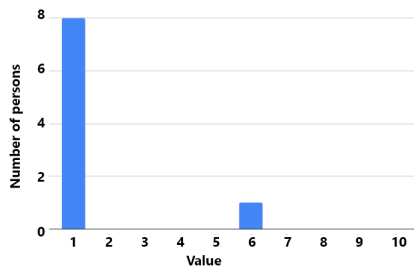
Finally they were asked if they would have answered this type of evaluation during a hotel stay. The result was overall positive, we believe that the reason to why some people did not agree depends on what they are used to, some people never answer evaluations and it is hard to change that behavior. However almost all answered a value of 7 or above which we believe is a good result.



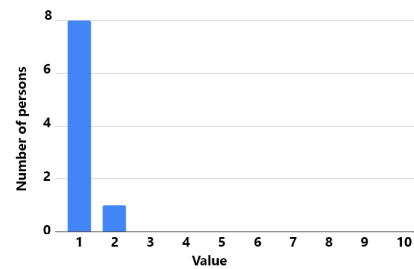
(a) It was easy to understand how to perform the evaluations.



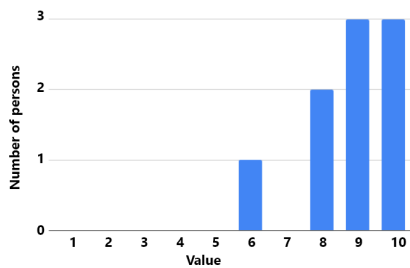
(b) I found the evaluations cumbersome to answer.



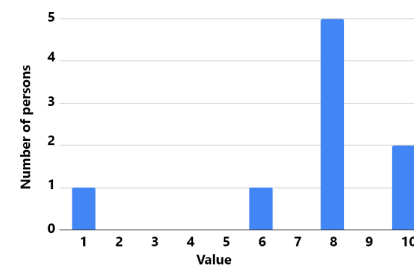
(c) I thought the design was confusing.



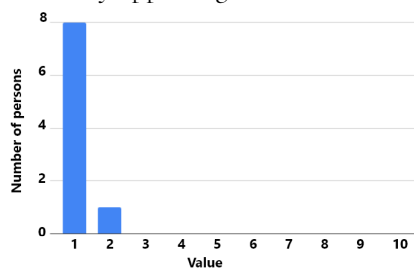
(d) I became frustrated while performing the evaluations.



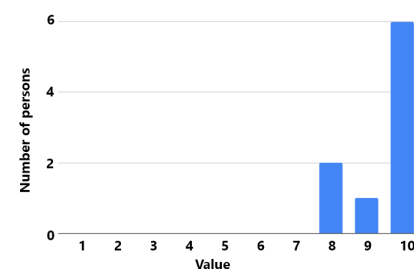
(e) I thought the evaluations were aesthetically appealing.



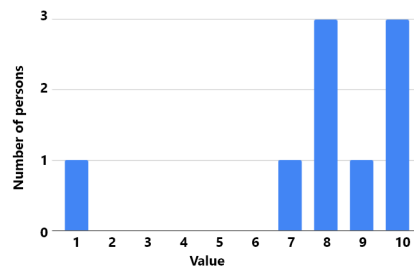
(f) It made me happy to answer the evaluations.



(g) It was demanding performing the evaluations.



(h) It felt smooth to perform the evaluations.



(i) I would have answered this type of evaluation during a hotel stay.

Figure 7.4: Results from survey final test

Chapter 8

Discussion

8.1 General

Overall we think we have gotten good results during the whole process including investigation, development and implementation. The hotel managers that were interviewed were very positive to the subject and provided us with informative knowledge and deeper understanding of the hotel business and the guests. All of them thought that knowing the guest's well-being during a stay is very valuable. From interviews with potential hotel guests we got some important aspects and understanding of what they would like and dislike, but it was also seen that everyone likes different things and some people will probably never be willing to answer evaluations. People have been overall positive to the prototypes during all test sessions and we have received many valuable comments and feedback about different design choices.

The study showed that the users want the evaluations to be fast to answer and easy to understand. The users expressed positive opinions and body language to non common design proposals and to non common color choices. However they often choose the design they are used to and have seen before during test sessions, e.g. it is common to have a five star rating scale and it is common to have yellow color on stars. Both tests and interviews showed that it can be hard to change someones behavior, it is hard to make someone start answering evaluations if they are used to never answering evaluations. The tests showed that the users want to have the opportunity to add additional feedback, however it should be optional.

8.2 Validity of Results

It is interesting that some of the results from test sessions and surveys differed. We believe that it depends on that the people who answered the survey did not get the same feeling

since they did not experience the interactions and designs on an actual device. Different color combinations may be perceived differently and opinions may differ if you have tested the different types of rating scales or just seen pictures of them.

Since the result from test sessions and surveys differed it would have been interesting to test the application in the real environment on hotel guests to see if that would make a difference as well. It would be more accurate to test the application on hotel guests that is unaware of that they are being tested because that can affect the result and willingness to answer an evaluation. It would also be interesting to perform tests with a larger amount of test users.

Another useful approach to compare two designs could have been to use A/B testing. A/B testing is a tool that tests one design on group A and another design on group B [20]. More neutral designs could be tested on group A and more colorful designs on group B to compare the response rate and responses.

From the results, it is obvious that when people get to choose from different icons or colors, they often choose the things they are used to and have seen before. As an example, yellow stars that is used in many evaluations have been more popular than other colors or icons that is more odd for evaluations. In our tests, people have got to choose what they prefer from different icons and colors but it would have been interesting to not let them have such an impact as they have had for this project. Would the implemented version of something more odd been as appreciated as the regular, yellow stars? This could have been tested in A/B testing as well. One version where users get to be included in design choices, and one version where they do not have such a big impact.

8.3 Future Work

8.3.1 Feedback

During the investigation phase many people expressed that they want to see what changes and improvements the evaluations carries. Therefore future work could be to explore how to process critique and how to give feedback to users in best possible way to prove that the critique is being considered and makes a difference e.g. display what action that has been taken for each review or a message that describes what action that will be taken for a guest's specific review.

8.3.2 Testing in the Right Environment

Many different test sessions have been accomplished during the project. However the test users could have been affected of knowing that they are being tested and therefore been more positive to answer the evaluations. Further development should include to test the evaluations on hotel guests in the real environment, unaware of them being tested, to see how many guests that actually answers the evaluations.

8.3.3 Personalize the Design

The application can be implemented so it can easily be personalized for each hotel if that is desired. If a hotel has a specific trade mark i.e. palm trees, the rating scales can be implemented with palm trees instead of stars or if the hotel is associated with some specific colors these can be added in some way.

The information, the attitude in the messages and how the hotels wants to make the evaluations more personal is also individual and it should be possible to customize it for each hotel.

8.3.4 Reward

During the first interviews with potential users and during the tests in iteration 2, 50% of the test users commented that you should get something in return for answering evaluations. That is something we can not influence and has to be decided individually for each hotel. However we believe that it can have a big impact on the response rate.

Chapter 9

Conclusion

The purpose was to investigate when the guests most likely want to answer evaluations and how to design the evaluations to be appealing. We have created an application with evaluation functionalities that can be integrated to an already existing application. The evaluations are designed to engage and please the user which was successful according to the result from test sessions during the implementation phase. We can now answer the research questions:

What information is valuable for the hotels to know about their guests?

During the investigation phase we had interviews with hotel managers and made a schedule with examples of what and when to ask certain questions. It was found that it is valuable to ask questions about one hour after the guest has checked-in to confirm that the room is good, after breakfast, after an order or service and after a visit to the restaurant. Since the hotels want to know the guests well-being it is also useful to ask about the overall impression during half of the stay. The schedule can be seen in figure 5.2.

When are the guests most open to answer evaluation forms?

The interviews with potential hotel guests resulted in many different answers and preferences, however it was concluded that many people wants as few notifications as possible, maximum 1-2 questions per day. The evaluations should require as few clicks as possible and the test users would be most open to answer the notification in the evening.

How should the evaluation be designed to generate a high response rate?

The test users want the evaluations to be quick to answer, easy to understand and with a joyful design. They tested many different types of rating scales, with different icons and different color combinations. Many of the test users thought it was too definite to use the binary rating scale and wanted to be able to add more input if necessary. They were positive to many of the suggestions, they specially liked the type of rating scales that they might have seen before e.g. the five star rating scale and a thumb to indicate good/bad which is very common. They were also positive to the coloring of the rating scales because they became

happy and interested and it will hopefully conduce to a high response rate.

What are the reactions to an implemented application?

The final implemented application were tested in the implementation phase and the test users found the evaluations to be aesthetically appealing, easy to answer and most of them would have answer the evaluation during a hotel stay. We are very pleased with the results and see a lot of potential in further development.

References

- [1] Jon A.Krosnick and Leandre R.Fabrigar. *Designing Rating Scales for Effective Measurements in Surveys* (1997). [Online]. Available: <https://pprg.stanford.edu/wp-content/uploads/1997-Designing-rating-scales-for-effective-measurement-in-surveys.pdf> (Accessed: 2020-06-12).
- [2] Mattias Arvola. *Interaktionsdesign och UX: om att skapa en god användarupplevelse*. Studentlitteratur, 2014.
- [3] Beverley A.Sparksa and Victoria Browning. *The impact of online reviews on hotel booking intentions and perception of trust* (2011). [Online]. Available: <https://www.sciencedirect.com/science/article/abs/pii/S0261517711000033> (Accessed: 2020-02-14).
- [4] Hanna Bayerlein and Fredrik Lütz. *The Rate of Rates: A Study in User Rating Percentage and Satisfaction Based on Design Choices* (2020). [Online]. Available: <https://lup.lub.lu.se/student-papers/search/publication/9006502> (Accessed: 2020-02-12).
- [5] BookBoost. *How Bookboost brings efficiencies to guest communications*. [Online]. Available: <https://www.bookboost.io/> (Accessed: 2020-04-20).
- [6] Dictionary.com. *The Definition of pastel*. [Online]. Available: <https://www.dictionary.com/browse/pastel> (Accessed: 2020-04-15).
- [7] Firebase. *About FCM messages*. [Online]. Available: <https://firebase.google.com/docs/cloud-messaging/concept-options> (Accessed: 2020-04-29).
- [8] &Frankly. *Därför finns vi*. [Online]. Available: andfrankly.com/sv/om-oss (Accessed: 2020-02-12).
- [9] Grace Fussell. *How Subtle Pastel Colors Can Make a Big Impact in Your Designs* (2019). [online]. Available: <https://www.shutterstock.com/blog/use-pastel-colors-designs> (Accessed: 2020-03-31).

- [10] Meryl Paula Gardner. *Mood States and Consumer Behavior: A Critical Review* (1985). [Online]. Available: <https://academic.oup.com/jcr/article-abstract/12/3/281/1856870?redirectedFrom=fulltext> (Accessed: 2020-02-12).
- [11] Sarah Gibbons. *Dot Voting: A Simple Decision-Making and Prioritizing Technique in UX* (2019). [Online]. Available: <https://www.nngroup.com/articles/dot-voting/> (Accessed: 2020-03-19).
- [12] InterContinental Hotels Group. *IHG App: the world of IHG at your fingertips*. [Online]. Available: <https://www.ihg.com/content/us/en/support/mobile> (Accessed: 2020-04-14).
- [13] Hotels.com. *Om Oss*. [online]. Available: https://sv.hotels.com/customer_care/about_us.html (Accessed: 2020-05-29).
- [14] ISO. *usability* (2010). [Online]. Available: <https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-2:v1:en> (Accessed: 2020-06-15).
- [15] J.C Jones. *Design methods*. John Wiley & Sons Inc, 1992.
- [16] Page Laubheimer. *The System Usability Scale (SUS): Post-Test Assessment of Usability* (2018). [Online]. Available: <https://www.nngroup.com/articles/measuring-perceived-usability/> (Accessed: 2020-06-15).
- [17] Hotel Lundia. *Use the Hotel Lundia app*. [Online]. Available: https://www.lundia.se/use-the-hotel-lundia-app-,specialoffers_viewItem_71-en.html (Accessed: 2020-04-14).
- [18] React Native. *React Native. Learn once, write anywhere*. [Online]. Available: <https://reactnative.dev/> (Accessed: 2020-04-14).
- [19] Jakob Nielsen. *Feature Richness and User Engagement* (2007). [Online]. Available: <https://www.nngroup.com/articles/feature-richness-and-user-engagement/> (Accessed: 2020-05-20).
- [20] Jakob Nielsen. *Putting A/B Testing in Its Place* (2005). [Online]. Available: <https://www.nngroup.com/articles/putting-ab-testing-in-its-place/> (Accessed: 2020-05-15).
- [21] Jakob Nielsen. *User Empowerment and the Fun Factor* (2002). [Online]. Available: <https://www.nngroup.com/articles/user-empowerment-and-the-fun-factor/> (Accessed: 2020-05-20).
- [22] Don Norman and Jakob Nielsen. *The Definition of User Experience (UX)*. [Online]. Available: <https://www.nngroup.com/articles/definition-user-experience/> (Accessed: 2020-04-14).
- [23] Jennifer Preece, Yvonne Rogers, and Helen Sharp. *Interaktionsdesign bortom människadator-interaktion*. Studentlitteratur, 2015.

- [24] Jeff Rubin and Dana Shisnell. *Handbook of Usability Testing, Second Edition: How to Plan, Design, and Conduct Effective Tests*. Wiley Publishing, Inc., 2008.
- [25] Porter & Sail. *The Guest Experience*. [Online]. Available: <https://www.porterandsail.com/experience> (Accessed: 2020-04-20).
- [26] Tactel. *The company. The people. And what makes us tick*. [Online]. Available: <https://tactel.se/en/about-us/> (Accessed: 2020-02-12).