



Designing to encourage remote socializing and physical activity

Identifying guidelines and implementing them in a concept

Master's thesis in Computer science and engineering

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Department of Computer Science and Engineering
CHALMERS UNIVERSITY OF TECHNOLOGY
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Cover: Three mockups of the final prototype.

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Abstract

The current pandemic situation has led to many people working from home, resulting in less social interaction and a more sedentary lifestyle. This problem was raised by the company HiQ and is the basis for this thesis. User research was conducted in order to find out more about how office workers experience the current situation and to get a deeper understanding of the problem. The user research showed that users have an unfulfilled need for socializing, as well as a wish for being more physically active than they are today.

Based on the user research, seven guidelines were identified for how to design to increase both social interaction and physical activity. Further, a concept in the form of an application was designed in order to explore a way of implementing these guidelines. This was an iterative process where users were involved along the way to evaluate and test the concept, and to find out whether their needs are fulfilled through the design. The result of this showed that this concept is something that users both need and would like to use.

Keywords: User experience, user interface, interaction design, social interaction, remote socializing, physical activity, quiz.

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1

Introduction

Due to the current circumstances of the Covid-19 pandemic, lack of social interaction among the population has increased. Swedish pandemic restrictions recommend those who are able to, to work from home, something that greatly affects office workers. There is a lot more to an office environment than just work, the social part of being at the office has a great impact on the work environment and the well-being of the employees. Activities like coffee breaks, after work, having a chat in the corridor, and such, are things that add to the cohesion between colleagues at a workplace. When this ceases, people are affected negatively, both mentally but also physically since the situation of not having to leave your home can lead to a sedentary lifestyle. Even though the project evolved from the pandemic situation and how severely it affects the well-being of office workers, this is a problem that, more or less, affects the majority of the population. Pandemic or not, there are still situations where it might be difficult to keep up a good relationship with co-workers at other offices or friends and family living far away. Furthermore, as many companies are located in multiple cities, this could imply a lot of travelling between different offices for their employees, something that affects the environment negatively.

However, it is not only the fact that people are working from home that lead to a decrease in physical activity. According to World health organization (WHO) (2020), from year 2001 to 2016 the proportion of people not being active enough increased from 32% to 37% in high-income countries. In addition to sedentary behaviour, passive transportation modes and free time spent inactively are some of the explanations for this.

The company HiQ requests a solution to this problem, suggestively in the shape of a smartphone application, that encourages both non-work-related social interaction between colleagues that are unable to meet in person, as well as physical activity. The focus for this project would be on designing the product, and not on the implementation of it. Thus, this would involve the practice of UX- and UI design as well as user research and testing.

HiQ is thus a stakeholder in this project, both in terms of being the company for which the work is done, and also as a target group since they see the need for such a product at their own workplace. The main target group is office workers, as they are affected by the restrictions of the pandemic to a great extent when having to work from home. However, as previously mentioned, this product has the potential

to reach many more people as it can be used by anyone wanting to socialize with someone far away. Furthermore, Chalmers University of Technology is a stakeholder, as they have set requirements for how this project should be carried out.

1.1 Purpose and aim

The purpose of this project is to encourage remote socializing as well as physical activity by identifying guidelines for how to design an application that intends to solve this problem. Furthermore, the aim is to design and prototype a suggestion on how such a solution might look like.

By investigating the different needs of users in the target group this would give insights in how the prototype should be designed to solve the problem.

1.2 Research question

The research question for this project has been formulated as follows:

- *What should be considered when designing an application which solves both the problem with lack of social interaction and lack of physical activity?*

2

Background

Solutions to keeping in touch with other people, such as voice and video calls, have existed for a long time. These solutions have also been integrated with activities and one big domain for this is the gaming world. Thus, interacting and sharing an experience or activity at a distance is not something new. This thesis though, would be about taking it to the next step and include a shared physical activity in the real world, outdoors, at a distance. A reason to do this is that studies show that physical activity has a positive effect not only on our physical health but also our mental health (Paluska & Schwenk, 2000).

A number of different products and services that are providing similar solutions have been analysed. Based on the research question, these were placed in two different categories depending on where their focus lies: products or services that focus on physical activity, and products or services where the focus is on the social interaction (see Figure 2.1). In order for users to be able to share their experience there has to be some form of multi-player possibility. Thus, this was also considered when investigating the products and services.

2.1 Focus on physical activity

Looking at some applications where the focus is on the user getting some physical activity it is clear that most of these are made for one person only. Some of them, like Pokemon Go¹, can however be used together with a video communication tool to get more of a common experience, but no product, where focus lies on physical activity, has been found that incorporates multiplayer mode in the application itself. However, one product that in some way fulfills this is Zwift², which is a cycling and running application in which users can virtually run and bike together from their homes. Though it is a training application it must be combined with additional hardware such as speed sensors, or foot pods, etc., to be able to recognize the users' movement, which means the application cannot be used by itself. Thus, it has a different scope from the one intended in this project. In the category of physical activity there are some applications in which exercise is the main activity, like Strava³, Zombies, Run!⁴, and Running stories⁵, where the user is expected to run

¹<https://www.pokemon.com/se/app/pokemon-go/>

²<https://www.zwift.com/eu>

³<https://www.strava.com>

⁴<https://zombiesrungame.com>

⁵<https://runningstories.app>

(although they can be used for walking as well). While Strava is a clearcut running application with focus on the actual running, *Zombies, Run!* and *Running stories* utilize audio to distract the user from the actual running. *Zombies, Run!* puts the user in the context of being chased by zombies, sometimes having to increase the speed to not get caught by them, while *Running stories* includes the runner in a story that is being created as the runner moves along the set out route. By adding objects like houses and nature into the story, the user can see the content of the story in real life. Other products instead use gamification and let users focus on another activity while they are moving around. Some examples of this are *Pokemon Go*, in which the players search for augmented characters in the real world, and *Geocaching*⁶, where the goal is to follow a map leading to physical objects hidden somewhere in the physical environment. An interesting aspect regarding the *Geocaching* is that players are the contributors to expanding the scavenger hunt. Users can add a treasure for others to find by placing an object anywhere and then marking it on the map. The same principle can be found in *Strava*, where one user can create a route, which other users then can choose to run. *Landlord*⁷ is an additional example where users move around in the physical environment during gameplay. This application is similar to *Monopoly* as the goal is to buy estates, but the difference here is that the player must move to the desired building in order to buy it. Another activity common in these kinds of applications is quizzes. There are some different solutions that have been incorporated for this. Some applications, like *Tipsrundan*⁸ and *Xnote*⁹, use pre-placed questions which the user has to find through a map. Here, the user has to walk to the right location in order to open the question. The other solution is to let the user walk wherever they want, as in *Active quiz*¹⁰ in which the user chooses a desired length of the route and receives a new question e.g. every 50th meter they have walked. This enables the user to do the quiz anywhere, not having to keep to a certain route, or walking by any specific places in order to access the question. However, this also requires the user to know how long their intended route is. One noteworthy aspect of the previously mentioned *Xnote* application is that its purpose is to let users send messages to each other, allowing users to hide a message somewhere near a friend, even if the users themselves are not close to that place. This is like an extension of the MMS, and possibly it enhances the feeling of affinity between the parties.

2.2 Focus on social interaction

A set of characteristics were identified for the products that were classified as focusing on social interaction. The first characteristic is whether the product or service can be used on its own or if it requires an external application to optimize the experience. Several of the products that were analysed required an external application to operate the voice or video communication needed for an optimal experience.

⁶<https://www.geocaching.com/play>

⁷<https://landlordgame.com/>

⁸<https://tipsrundan.se/>

⁹<https://www.xnoteapp.com/sv/>

¹⁰www.activequiz.se

Among us¹¹ is a multiplayer game that is a modern take on the well known board game Mafia¹² where the players have to cooperate to find the imposter. Among us has an integrated chat where you can contact the other players but according to L. Lazaroo (personal communication, february 2021), who has played the game several times it is a lot more fun if you have the possibility to talk to the other players through at least a voice call. One reason for this is that it facilitates proper discussions and it is also easier to make smalltalk throughout the game. Another service available is live streamed quizzes which are often streamed on platforms such as Youtube¹³. They do not require any external tools per se but if one wants to team up with someone who is located far away it is possible to connect through a voice or video conference platform like Zoom¹⁴ or such. When it comes to services like live stream quizzes and online tasting experiences they are based on streaming services or video conference platforms and therefore heavily rely on these.

Scavify¹⁵ is an application that allow users to play as a team. However, if you do not meet face to face it mostly consists of asynchronous communication. Other applications and services like Among us, Kahoot¹⁶, Live streamed quizzes and online tasting experiences all rely on synchronous communication. In a study made by Hrastinski (2008) students expressed that during a synchronous discussion they did not feel obliged to only talk about the content of the course and there was also a higher feeling of working together. Hrastinski (2008) mentions that it is likely that these factors increase the motivation and convergence of meaning, particularly in smaller groups. Live streamed quizzes and online tasting experiences both require some kind of moderator or administrator. If you do not want to do it yourself there are many free quizzes to enter but you can also hire a quizmaster or e.g. a cheese expert to host a quiz or tasting explicitly for your group. The application Scavify also somewhat require a moderator or administrator because in order to play someone has to create a program with a list of challenges and then launch it so that people can join and play. It is possible to both create your own challenges but also to pick from suggested challenges. One difference is that in Scavify, the administrator can also take part of the actual game, whereas in live stream quizzes and online tastings, the host is there to lead the game or guide the tasting. An alternative to a live streamed quiz with a so-called quiz master is online quizzes like Kahoot. Here, you can pick from ready made quizzes and it does not require a host per se. However, if you want to play it remote with friends, you have to use some kind of external communication platform like Zoom or Microsoft Teams¹⁷ as the questions are shown on one screen only and that is the screen of the person starting the quiz. All players can then join in through their own device via a pincode in order to answer the questions by picking an alternative. If you want to play in teams you have to actually be in the same room as your teammates since a team uses a shared

¹¹https://store.steampowered.com/app/945360/Among_Us/; <https://amongusplay.online/about>

¹²<https://boardgamegeek.com/boardgame/32471/mafia>

¹³<https://www.youtube.com>

¹⁴<https://zoom.us/>

¹⁵<https://www.scavify.com>

¹⁶<https://kahoot.com>

¹⁷<https://www.microsoft.com/sv-se/microsoft-teams/group-chat-software>

device to answer the questions, ergo it is basically an "all against all-game". Among us is not a team game either but it is also not an "all against all-game" since you have to cooperate to find out who the imposter is, but you also have to keep in mind that one of the people you are cooperating with is the actual imposter.

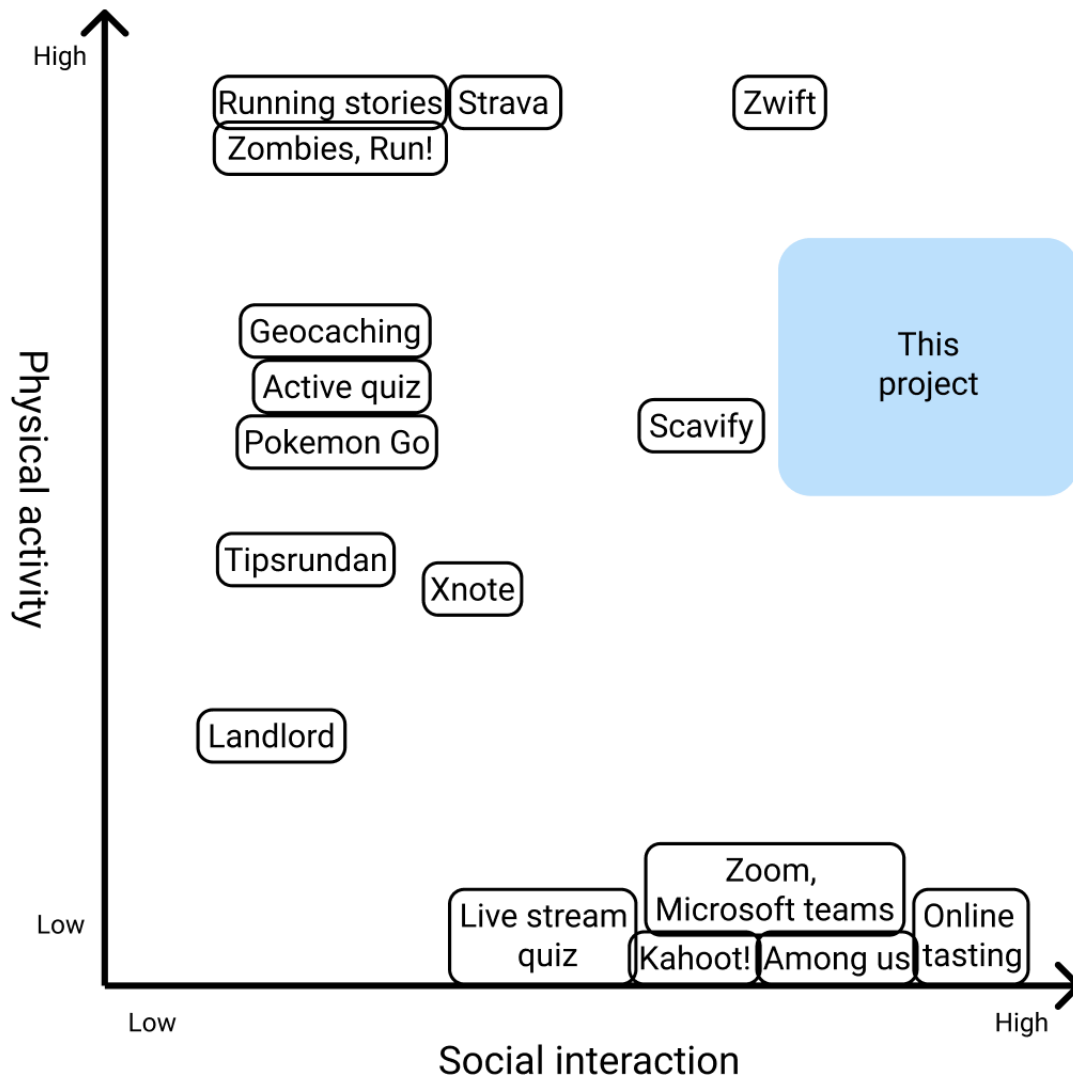


Figure 2.1: Competitive solutions placed in a coordinate system based on how much they involve physical activity and social interaction.

2.3 Insights and inspiration

As can be seen in figure 2.1 the aim of this project is to end up far to the right and somewhat above the middle in the diagram. Thus, it should encourage social interaction to a great extent, while the physical activity is slightly above a moderate level. The reason for the physical activity not being higher is that the intention is

not for the users to exercise exhaustively as in Strava or Zwift, but rather to get some everyday physical activity in order to reduce the amount of time sitting still. One product quite close to the intended position in the diagram is Scavify. Although challenges are physically spread out making participants move around they still compete on their own, receiving individual scores. This is an aspect that is intended to be increased in this project, putting more focus on the togetherness and the shared experience.

The benchmarking also gave some inspiration on what other solutions look like and which elements and functions are included in these. An example of this is the way a question is triggered. Users might walk to a specific coordinate in order to receive a question, or they could walk a certain distance measured in meters to unlock a new question. At this stage of the project it was not yet decided what the solution would be, but the products investigated during the benchmarking was brought along to use as inspiration throughout the whole process.

2. Background

3

Theory

This chapter introduces theory that is relevant to the thesis. Two important areas has been researched; communication - and the difference between remote and face to face communication, as well as physical and mental health in relation to physical activity and working remotely. Relevant design theories, philosophies and principles will also be presented in this chapter.

3.1 Communication

When communicating with people at a distance there is a need for some sort of communication tool. Two approaches to this are using video and audio, or only audio. In order to understand the difference between these, as well as pros and cons of the respective approach, research has been made around this. Thus, this will contribute to making a more informed decision about which approach to adopt when designing a concept.

Although the amount of social interaction people can take part in has been reduced, and the way in which it is performed has changed (both due to the pandemic situation), it is worth pointing out that people have different preferences and needs. More extroverted people have a stronger need for socialization, and therefore a higher motivation to meet this need, while this need is lower for people who are more introvert (Jensen, 2015). When it comes to how to communicate, most people prefer to talk face to face. Still, one study has found that using communication technology is preferred by introverted people, while extroverts rather communicate face to face (Jensen, 2015).

A study by Ross et al. (2006) investigated the effect of video communication compared to auditory only in noisy environments. It was found that video stimuli enhanced the amount of information that participants could recognize from the speech on all investigated signal-to-noise ratios. Thus, when using several modalities (vision and audition) the listener can discern more of the content than if only auditory stimuli was available. This is also stated by Jensen (2015) who writes that both auditory and visual information contribute to how people interpret a message. Jensen (2015) also argues that people have to use their working memory capacity for actually hearing the message in noisy environments or other situations in which it is difficult to hear what is being said, while they under perfect conditions can use this capacity to understand what has been communicated. In noisy environments,

the non-verbal communication is also more important (Jensen, 2015). Thus, in outdoors environments it is important to keep in mind that users might have to use more working memory on hearing and interpreting the conversation and therefore can not use their working memory on several other tasks as well. This could also imply that the cognitive load might be higher generally, since the number of items held in working memory affects the cognitive load (Moreno & Park, 2010).

3.1.1 Turn-taking

According to Levinson (2016), social interaction between humans relies on the fundamental organizational principle of turn-taking. Seuren et al. (2020) argues that the system of taking turns is one of few things that is universal when it comes to communication, and it has to do with the norm of one-speaker-at-a-time. To maintain this norm the turn-taking system also minimizes overlapping talk.

When the speaker has finished their turn and selected the next participant to produce an action, for example by asking someone a question, a possible silence might, in many cases, be interpreted as a noticeable absence of the expected action. This kind of silence, noticeable silence, may be treated as that the recipient refuses to produce the expected action, and even if there is no designated next speaker, eventual silence between turns might be interpreted and treated as absence of talk, meaning that one of the participants “should” self-elect to speak (Seuren et al., 2020).

Jensen (2015) writes about certain measures the parties can use for regulating the turn taking. Some of these are auditory, like adding a “ehm” in a pause, or using a raised intonation at the end of a question. Many of them are also visually based, like gesturing an open hand to someone else to invite them to speak, or searching for eye contact with the current speaker to show that you have something to say (Jensen, 2015). Depending on which communication media is used, some of these measures can not be used by the participating parties. If using audio without video, the participants can not use the visual aspects, but will have to rely on auditory aspects only. Jensen (2015) further stresses the importance of feedback - like facial expressions, head movements, and vocal sounds - which all make the conversation run smoothly. Approximately 20% of what is communicated comes from the listener. If no feedback is received this could lead to an uncomfortable situation for the speaker, feeling insecure and confused (Jensen, 2015). Thus, a noticeable silence has occurred. The expression on someone’s face can also show the current state of that person, such as being happy or surprised. However, some states, like being calm, nervous, or eager, can also be revealed by the voice of the speaker, in terms of pitch, volume and speech rate (Jensen, 2015).

The system of turn-taking is built for a context where the recipient perceives turns and the speaker produces turns simultaneously, but when there is latency involved, visual cues can be misunderstood and misperceived. Latency is defined as “the technology-generated transmission delay between when a participant produces an action and when the co-participant(s) perceive that action.”. When a conversation

is affected by latency, perception and the production of actions do not co-occur anymore, which affects the participants' ability to manage the turn-taking (Seuren et al., 2020).

A study by Seuren et al. (2020) shows that participants are rarely aware of the latency, even though they often know that technical problems might emerge when communicating through video. The participants of the study by Seuren et al. (2020) still proceeded under the same characteristics as of a face to face interaction. But something to keep in mind is that the participants of a video-mediated interaction (VMI) perceive the world differently, there are two different realities that are not mutual and none of them are more, or less, accurate than the other. For example, if a video call is affected by latency, one participant might perceive that the order of the things that are being said is different from how the other person perceives it. One person might ask a question, and when they feel like they are not getting an answer they might ask the question again and then they get an answer, while the other person hears a question, answers the question and then hear the question again (Seuren et al., 2020).

3.1.2 Gestures

Looking at remote communication, there are some aspects that can not be integrated to the same extent as face to face communication. Sherman et al. (2013) investigated the number of so-called "affiliation cues" (smile, laughter, head nods, and gestures) used when communicating in person, through video, audio, and instant messaging. They found that participants used a significantly higher amount of such cues in person compared to video communication, in video compared to audio communication, and in audio compared to instant messaging. Looking at these cues, all of them but gestures are quite easy to notice in a video chat, assuming there is a clear image. Gestures are possible to show but that requires the speaker to perform them inside the square that makes up the video. However, Fichten et al. (1992) found that people rely on a more diverse set of audible cues when talking on the phone, as a compensation for not being able to utilize visual and touch cues found in face-to-face communication. This is also mentioned in Jensen (2015), who argues that people try to be more expressive using the available production modalities (ways in which a message can be produced, like words and gestures), in order to compensate for the lost sensory modalities (ways in which we, through our senses, take in communicated information, like listening and looking at the communicator).

Driskell and Radtke (2003) argue that there are two ways of looking at gestures enhancing communication: i) that it helps the listener understand the message, and ii) that it helps the speaker formulate speech and express themselves. It was found that both of these perspectives are true for gestures produced alongside speech, and that gestures help the listener the most when terms regarding spatial location and manipulation or movement were expressed by the speaker (Driskell & Radtke, 2003). However, since this study examined face to face communication, it is not certain what effects such gestures would have when communicating through video.

Whether verbal or non-verbal communication stands for the main part of the message also depends on the content (Jensen, 2015). Non-verbal communication is dominant where the subject of the conversation is social or emotional, whereas verbal communication mediates the main part of the message for subjects regarding cognitive content, like facts. What mainly carry the non-verbal communication are facial expressions and the voice of the speaker (Jensen, 2015).

3.1.3 Affinity

Jensen (2015) argues that some communicative aspects enhancing the feeling of affinity are mirroring, emotional contagion, and touch - all of which are non-verbal. Mirroring means that one party imitates the other, and this could be both actions, speech rate, smiles, and intensity of gestures. However, the mirroring should be unconscious. If it is intentional it could have negative effects, as it seems too obvious (Jensen, 2015). Emotional contagion means that if one person expresses an emotion, the others involved in the conversation would feel that emotion as well, which increases rapport (Jensen, 2015). When it comes to touch, the cause and effect can be two sided. Touch could lead to rapport, or rapport could lead to touch (Jensen, 2015). How do communication media differ when it comes to feeling close and bonding? Studies have shown that intimacy and frequency of self-disclosure, as well as affinity or affection is higher when communicating digitally than in person for strangers, while friendships offline seems to induce a higher quality of the relationship than friendships online (Sherman et al., 2013). Sherman et al. (2013) found that participants reported a significantly higher feeling of liking/bonding in person than using audio chat. However, the difference between in person communication and video chat was not significant (Sherman et al., 2013), suggesting video chatting can induce a sense of bonding close to that of face to face communication, among people who already know each other.

Kirk et al. (2010) also investigated what makes people feel close when communicating through video at home. They found that, among adults, participants considered video communication to be quite intimate, as it mostly was shared with family or partners, and not with many friends. Participants also stated that video made them feel closer to the person with whom they communicated, than talking on the phone. One reason for this was the dedication the two parties show each other during the call. When using video they cannot do anything else at the same time, since the other person will notice, which differs from phone calls where the parties cannot see what the other is doing. Kirk et al. (2010) further mention that some people wish to use video communication while performing another activity - an activity which would be the topic of the conversation. Although video was preferred, it was also found that participants found the audio quality to be most important. Therefore, Kirk et al. (2010) argues that a good feature in a video communication system would be that it automatically turns off the video if the audio is compromised.

Another interesting aspect is the relation between people depending on the distance on which they communicate. Bradner and Mark (2002) showed that participants

were less persuaded by the communicative partner when they believed her to be in a distant city compared to the same city. Thus, the arguments provided by the partner were less convincing for the participants. Furthermore, it was found that the level of cooperation was lower in the distant city condition (Bradner & Mark, 2002). However, as participants completed more trials, the cooperation level increased. It is worth noting that this experiment regarded the relation between strangers, and it is therefore not sure if these results would be applicable to people who know each other.

3.2 Physical and mental health

Physical activity is shown to have a positive impact on the mental health and general well-being of humans (Faulkner et al., 2021). Mental health is also improved by cooperation, and if the cooperation is successful it could also lead to a stronger feeling of liking among the members (Jensen, 2015).

3.2.1 Physical activity

WHO (2020) defines physical activity as “any bodily movement produced by skeletal muscles that requires energy expenditure”. While “Exercise is a subcategory of physical activity that is planned, structured, repetitive, and purposeful in the sense that the improvement or maintenance of one or more components of physical fitness is the objective” (WHO, n.d.).

Physical activity performed regularly provide notable health benefits, as it has been shown to prevent several diseases as well as improving the mental health of people. It also helps individuals to keep their body weight at a healthy level (WHO, 2020).

3.2.2 Zoom fatigue

First of all, it is important to understand that it is not only extensive use of the communication platform Zoom that causes Zoom fatigue, but Zoom fatigue is a part of a larger experience called computer-mediated communication exhaustion, or CMC exhaustion for short. According to Thurlow et al. (2004), all kinds of computer technology is included in CMC, and since technology is constantly changing and evolving, so is CMC (Romiszowski & Mason, 1996). The term Zoom fatigue is merely an umbrella term that describes the symptoms experienced after extended use of technology, usually CMC platforms with audio-visual technology (AVT). Further, the core of this novel phenomenon is not something new, rather it is something that many have experienced before (Nadler, 2020).

Hearing a voice in CMC might be very similar to hearing a voice face to face, but something that does not carry over in CMC is the spatial dynamics, and according to Nadler (2020) this is key to understanding CMC exhaustion since space occupies essential but complex roles when it comes to human interaction, both physical and

virtual. Space influences our physical actions. One example is that when an experience occurs in a space that is usually devoted to another experience (e.g. working from home), a CMC user might be waging battles and/or reacting to battles, such as unwanted elements like a roommate walking by or a cat crashing the video call, which in turn can cause exhaustion. Fosslien and West Duffy (2020) mention that one reason we might find video calls draining may partly be due to the fact that they make us focus more intently on conversations to absorb information. It is also very easy to lose focus during a video call since it is so easy to check your email, text a friend etc. at the same time. When using CMC there are a lot of different elements that draw attention and pull energy (physical, cognitive and emotional) such as video screen, thumbnails, presentation, chatbox etc. Wiederhold (2020) suggests that, due to a decrease in non-verbal cues, the required cognitive effort increases when one only has a face to draw cues from. Another spatial aspect is that before the pandemic, the office space encoded the environment as a specific context, now the only thing that does this might be a laptop, which also, simultaneously, is a network for talking to friends, looking at funny videos etc. Therefore, no matter how many times one uses the laptop to work, it is hard to get the same feeling as you get at the office since the environments differ so much (Nadler, 2020).

CMC-exhaustion might be ubiquitous but at the same time, it might feel very isolating. Even though all parties within a CMC exchange might be experiencing it, it is still not a shared experience. When communicating face to face, the personal interstitial space of everyone involved turns into a mutual interstitial space, but in CMC the personal interstitial spaces are merely linked and synchronously engaging with each other (Nadler, 2020). Nadler (2020) also suggests that CMC exhaustion might partially be a synergistic case of cognitive overload. Another thing that can add to Zoom fatigue is that you are aware of, not only everyone's faces but also everyone's background. It may be like being in several different rooms at the same time, looking at peoples plants, books, wallpaper, etc. leading to many different visual cues that has to be processed at the same time (Fosslien and West Duffy, 2020).

Fosslien and West Duffy (2020) argues that Zoom fatigue derives from how humans process information over video. Looking straight into the camera is the only way to show that we are paying attention but "in real life", staring into someone's face during a whole conversation does not happen that often. Engaging in a constant gaze is tiring and uncomfortable. If one were to gaze out through the window during a video call one might worry that it looks like you are not paying attention, and to add to that, one also might be staring at a small window of oneself, making one very aware of oneself. People need visual breaks to refocus.

3.3 Design theory

This section describes design theories, philosophies and principles applicable to this thesis.

3.3.1 Wicked Problems

Wong (2020) states that a great deal of the design problems that need to be confronted are wicked ones. According to Rittel and Webber (1973), both the mission of wicked problems and whether they have been solved or not are unclear. They describe ten different properties of a wicked problem:

1. **There is no definitive formulation of a wicked problem**
The definition of the problem can not be established until one has found the solution.
2. **Wicked problems have no stopping rule**
There are no rules declaring that a solution has been achieved, things could always be improved.
3. **Solutions to wicked problems are not true or false, but good or bad**
The solution is not binary, depending what party is judging it they will consider it as better or worse.
4. **There is no immediate and no ultimate test of a solution to a wicked problem**
Things will be affected by the solution for a very long period of time and its long-term consequences can not be tested.
5. **Every solution to a wicked problem is a "one-shot operation"; because there is no opportunity to learn by trial and error, every attempt counts significantly**
You can not just try a solution to see if it works since it could have irreversible consequences.
6. **Wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan**
It is not possible to show that all possible solutions to a wicked problem have been taken under consideration or thought of.
7. **Every wicked problem is essentially unique**
No wicked problem is exactly like another, there is always some aspect in which they differ. There are no categories of problems to which a single solution can be applied.
8. **Every wicked problem can be considered to be a symptom of another problem**
When looking for causality of a problem one will find that the current problem stems from another one.
9. **The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution**
The explanation is "in the eye of the beholder" - everyone adopt the solution

that fits them best.

10. **The planner has no right to be wrong**

The actions taken can affect people to a great extent.

3.3.2 Human-Centered Design

Human-centered design, which is a design philosophy (Norman, 2013), focuses is on the user; what are their needs and requirements, in order to create useful and usable systems (International Organization for Standardization [ISO], 2019). Besides taking the end-user into account, other groups who potentially could be affected have to be taken into consideration. To aid the understanding of users, they should be involved in the design process, as well as in the evaluations. Based on user feedback the design can be improved to meet the users needs. Human-centered design further stresses the importance of an iterative design process, as designers cannot precisely define every characteristic that should constitute the design. Therefore the users should be involved in the evaluation both during the iterations, as well as for the finalized product. Furthermore, it is important for the design to acknowledge the whole user experience. This means the way in which the interactive system is presented, behaves, functions, etc. However, the user experience additionally depends on the personality, skills, previous experiences, etc. of the user. Finally, the teams of human-centered design should involve multidisciplinary perspectives and skills (ISO, 2019).

3.3.3 Don Norman's Seven Fundamental Principles of Design

These design principles are based on seven questions that users could ask themselves while using a product. The design thus has to be able to provide answers to these questions, and by employing the design principles this can be accomplished (Norman, 2013). The seven fundamental principles of design are:

- **Discoverability** - The user can understand the possible actions as well as in which state the device is at the moment.
- **Feedback** - Throughout the whole interaction the user is provided information about what their actions result in, as well as the product's state.
- **Conceptual model** - To make users feel in control as well as aid their understanding, information required to create good conceptual models for users is provided.
- **Affordances** - To make the users able to perform the actions they want, the correct affordances are provided.
- **Signifiers** - To make sure discoverability exists and that users understand the provided feedback, helpful signifiers are provided.

- **Mappings** - Good mapping between the controls and what they do is provided.
- **Constraints** - To aid the users' interpretation, constraints which are physical, semantic, logical and cultural are provided.

3.3.4 Usability

According to Jordan (2002), usability has to do with the user-friendliness of a product. However, products might differ in how usable they are depending on the user, e.g. if they have any previous experience with the product or similar products within the same domain. Demographic factors may also have an impact on how users perceive the usability of a product.

The ISO definition of usability is stated as follows:

"The 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." (ISO, 2018, standard no. 9241-11:2018)

3.3.4.1 Nielsen's 10 Usability heuristics

Nielsen (1994) provides 10 rules of thumb when it comes to interaction design. These are:

1. **Visibility of system status** - By providing feedback, users should know what is happening in the system.
2. **Match between system and the real world** - The design should utilize natural mapping (controls match users' desired results) and use wordings that users understand.
3. **User control and freedom** - Users should easily be able to cancel an action.
4. **Consistency and standards** - Make the product consistent, e.g. using platform conventions, with other products.
5. **Error prevention** - The design should hinder errors from occurring.
6. **Recognition rather than recall** - Important parts of the interface should be visible or easily accessible, making the load on the user's memory lower.
7. **Flexibility and efficiency of use** - Allow the design to support both expert and novice users, by enabling faster ways of interaction. The users should also be able to customize actions they do often.
8. **Aesthetic and minimalist design** - Avoid displaying irrelevant or seldom required information.

9. **Help users recognize, diagnose, and recover from errors** - Provide clear and understandable error messages that users are able to notice.
10. **Help and documentation** - Ideally the users should be able to interact with the system without needing more explanations. But in some cases they do need some documentation, which the users should be able to search in an easy way.

3.3.5 Designing for mobile interaction

According to Marshall et al. (2016) many portable designs employ the “stop to interact” mode, meaning that every time the user actually interacts with the design they should stand still. Marshall et al. (2016) however, argue that people nevertheless do interact with products whilst moving, and therefore it is important to take this into consideration, both because of safety and because of the limitations the activity puts on the interaction. When combining locomotion and interaction it is of high importance to consider the risks this could result in, and to weigh this against the benefits of the product. Marshall et al. (2016) further presents four strategies for interaction in motion, placed along two dimensions; the relation between locomotion and interaction, and inhibition in interaction caused by locomotion (see Figure 3.1).

The application intended to be developed in this project would be placed in the bottom right square, as walking poses little constraints on the interaction, and the purpose of the locomotion is to advance in the application (the interaction is dependent on the movement). Design strategies specific for this quadrant utilizes the fact that there is not much constraint on the interaction, thus there is more room for aesthetically combining this with locomotion. The design should also make the users aware of the surroundings in which they move around. Lastly, the design should consider the “pleasure of motion”, that is, to acknowledge the pleasures that movement can give rise to (Marshall et al., 2016).

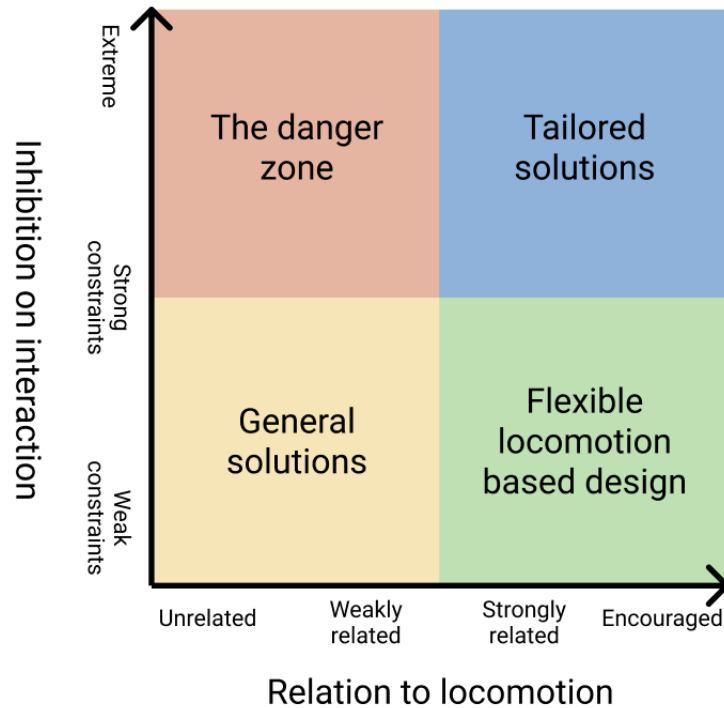


Figure 3.1: Four strategies for interaction in motion (Marshall et al., 2016).

Marshall and Tennent (2013) describe some challenges that could occur in interaction in motion. The first is that the designers have to consider the amount of cognitive load the users are exposed to during the time of interaction. Users have a certain amount of cognitive capability and when this is reached they will not be able to pay attention to any additional stimuli. A second challenge regards the fact that both interaction and movement might require access to the same body parts, e.g. touchscreens require the user to move their body and eyes, this at the same time as the user should move around in the physical environment. Thirdly, designers should consider the terrain that users could move around in as this can affect the interaction. This could be factors such as light levels, rain, or traffic, but also digital terrain, such as internet connection. Lastly, other people might pose a challenge, both when users want to share the experience with someone they know, but also when moving around in different social environments such as crowded places, in which they have to avoid walking into another person (Marshall & Tennent, 2013). These challenges can thus be considered when designing for interaction in motion.

4

Methodology

This chapter describes the implemented design process as well as how to conduct the methods used in this thesis. The methods are presented in relation to the part of the design process that they are used in.

4.1 Design process

This project will follow the double diamond design process, which includes the four steps “discover”, “define”, “develop”, and “deliver” (see Figure 4.1). The double diamond is a non-linear, iterative design process, returning to the first step after receiving some insights (Design council, 2015).

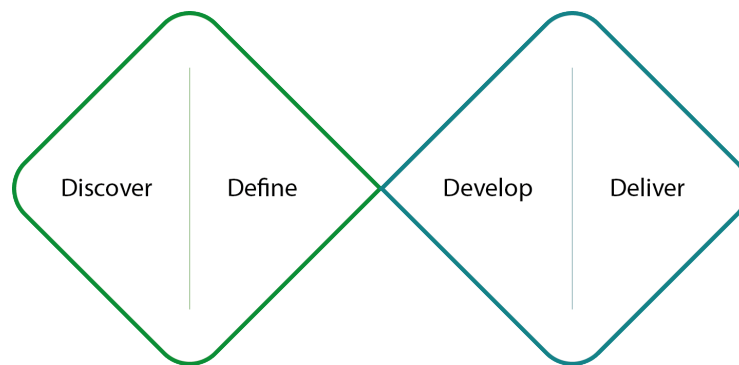


Figure 4.1: Double diamond (Design council, 2015).

4.2 Discover

The first phase in the double diamond is called Discover. The focus here is on gaining more knowledge about what the problem actually is by applying divergent thinking, thus exploring the matter deeply and widely (Design Council, 2015).

4.2.1 Literature review

A literature review is conducted in order to collect information from previous work that is relevant for the current project. It summarizes the essential parts and links up each source in a way that appropriately connects it to the focus of the ongoing project. A literature review can sometimes be a work of its own, but most often it constitutes one part of a bigger project (Hanington & Martin, 2012).

4.2.2 Benchmarking

According to Stapenhurst (2009) benchmarking is a wide subject, some define it as the process of comparing practices while others consider it as the process of comparing practices as well as comparing their performances.

4.2.3 Questionnaire

A questionnaire can consist of open questions, where respondents answer freely, and closed questions, where alternatives are provided (Preece et al., 2015). When using closed questions respondents are restricted to choose among a few alternatives. Thus, it might be hard to cover every possible answer in this type of question, leading to respondents giving an answer that does not fully represent their view (Shaughnessy et al., 2015; Wadsworth, 2011). Even if an option of “other” is provided, the alternatives might still bias the respondents as to not think freely. However, it is important to note that there could also be a risk of having no alternatives as these can also serve as a help to make the respondents start thinking and getting some inspiration for their answer. Another aspect to consider is that the questions should not be ambiguous since the respondents do not have the opportunity to ask someone if they do not understand a question (Preece, et al., 2015). To make sure that this is the case a questionnaire can first, by the use of a pilot test, be checked for confusing wordings, by people familiar with the topic, as suggested by Shaughnessy et al. (2015). This pilot test can also show if it is easy, relevant, or too long (Wadsworth, 2011).

4.2.4 Interview

There are different styles one can use for performing interviews - unstructured, semi-structured, and structured. The unstructured is more like a conversation about a specific topic and doesn't include a list of pre-planned questions. However, the goal is still to get answers on the topic and therefore the content of the conversation has to be relevant. One advantage of this technique is that new things that the interviewers had not thought of beforehand might appear (Preece, et al., 2015). In a structured interview, on the other hand, the questions, often involving alternatives, are predetermined and phrased in the exact same way for every participant (Preece, et al., 2015). A semi-structured interview is a combination of the other two as it uses different forms of questions - both open and closed - where the interviewer utilizes a script with some questions that should be covered, but there is also room for follow-up questions (also called probes) (Preece, et al., 2015). Conducting interviews digitally differs from the common way of face to face interviewing. However, digital tools have been gaining popularity, with one advantage being the more relaxed feeling of participants being in their natural environment (Preece, et al., 2015).

4.3 Define

During the define phase convergent thinking is applied in order to narrow down the insights that have been gathered during the previous phase (Design Council, 2015).

4.3.1 KJ-analysis

In the KJ technique notes about insights, data, etc. are written down individually and then sorted into categories during silence (Hanington & Martin, 2012). Normally the KJ technique utilizes sticky notes and markers, the participating members are located at the same place, and the notes are physically moved around as they are being sorted (Hanington & Martin, 2012).

4.3.2 Personas

A method that can be used for understanding the needs and behaviours of the users is the creation of personas (Dam & Siang, n.d.). Personas are based on gathered data from user research, and the description of them is very thorough (Preece et al., 2015). The advantage of this method is that it can help understand the users, thinking about the design from the users' perspective (Dam & Siang, n.d.).

Cooper et al. (2014) describe one way of constructing personas. This method consist of eight steps:

1. **Group interviewees by role**

2. **Identify behaviour variables**

For each role identified in the previous step, a set of behaviour variables should be identified and documented.

3. **Map interviewees to behavioural variables**

4. **Identify significant behaviour patterns**

By analyzing the mapping performed in the previous stage behavioural patterns can be identified. This is done by looking for clusters of behaviours. If interviewees cluster on six to eight different variables they are presumably representing a significant behaviour pattern.

5. **Synthesize characteristics and define goals**

Details from the data gathered should be synthesized for each significant behaviour pattern and at a minimum include:

- The environment of use
- Demographics associated with the behaviour
- The behaviours themselves
- Frustrations that are related to the behaviour
- Emotions and attitudes correlating to the behaviour
- Skills, abilities or experiences related to the behaviour
- Alternative or competing ways of doing the same thing

- Interactions with other people, services or products that are relevant

6. Check for redundancy and completeness

Look for potential gaps in the mappings and characteristics and goals of the personas. If two personas are very similar one can either be eliminated or tweaked.

7. Designate persona types

Prioritize the personas to determine which of them should be the primary target and which should be secondary or supplemental.

8. Expand description of attributes and behaviours

Make the personas come to life by creating narratives and adding photos.

4.3.3 Definition of requirements

In a requirements specification all functions that the product should fulfill are stated. These functions can be both tangible, and more abstract - such as a feeling that the product should evoke (Österlin, 2016). The stated functions should be complete and thus consider all stakeholders, aspects, etc. Furthermore, they should be unambiguous, measurable or controllable (if possible), and non-redundant (Johannesson et al. 2013). By creating a requirements specification both goals and an evaluation template is formed (Österlin, 2016). Thus, this method is a way of more clearly visualizing what aspects the product needs to include. Additionally it allows for rating of the different functions, so as to show which requirements are most important or must be included, and which are not as necessary.

According to Cooper et al. (2014) the process of defining requirements is an iterative process that can be divided into five steps. The methods included in this process are founded on a persona-based scenario methodology:

Create problem- and vision statements

The focus of a problem statement should be of a situation that is in need of a change, for the personas as well as for the business who is providing the product. The intent of the design initiative is what is defined in the problem statement and it often enlightens the cause-and-effect relationship between personas and the business. A vision statement on the other hand, centers around the needs of the user and it is an inversion of the problem statement. The reason for constructing these statements is to have a clear mandate for proceeding forward and to help build consensus among the stakeholders.

Explore and brainstorm

To avoid focusing too much on possible solutions and risk developing preconceptions about what these solutions might look like, Cooper et al. (2014) advocates for conducting a brainstorming session where the participants explore every possible and impossible idea. The reason for doing this is to eliminate as much preconception as possible, keeping the mind of the designers open and flexible.

Identify persona expectations

Due to the importance of the represented model of the product interface matching the mental model of the users it is useful to understand what expectations the personas might have concerning the product. In order to do this, expectations regarding the following can be identified for the primary and secondary persona:

- Attitudes, aspirations, experiences
- Expected or wanted behaviours from the product
- Desires and general expectations
- The persona's thoughts about basic elements of the product

Construct context scenarios

The story of a specific persona is told through a context scenario. Context scenarios should, at a minimum, address the following questions:

- Do several people use a single device?
- Is the persona frequently interrupted?
- Will it be used for extended amounts of time?
- With what other products will it be used?
- How much complexity is permissible, based on skills and frequency of use?
- What primary activities does the persona need to perform to meet their goals?
- What is the expected end result of using the product?
- In what setting will the product be used?

Identify design requirements

The last step of the process is to identify design requirements. When an initial draft of the context scenarios is finished, it can be analyzed in order to extract the needs, desires and/or design requirements the personas might have. A design requirement consists of an action, a verb describing what the user is doing, an object, something or someone who is involved in the action, and the context of where the action is performed.

4.3.4 User Journey Mapping

User journeys is a method that is used to define, through a detailed narrative, how an individual persona is using the service (Cooper et al., 2014). According to Hanington and Martin (2012), a user journey map should tell a story about a user's actions, perceptions, feelings and state of mind throughout the process of use. Hanington and Martin (2012) also mention that a user journey map is beneficial for developing a shared vision among team members and it is often created alongside or just after the development of personas and context scenarios.

4.4 Develop

The develop phase involves divergent thinking and answers to the defined problem should now be explored (Design Council, 2015). This can include ideating on ideas and concepts, and creating prototypes.

4.4.1 Morphological Matrix

Morphological matrix is a method that mainly focuses on combining different ideas and sub-functions to create new ideas and concepts that otherwise would never have been thought of. The goal is to generate a number of concepts that all meet the requirements set in the product specification. The matrix is created by putting the different sub-functions in the far left column and all the different partial solutions to each sub-function on the allocated row. Concepts are then generated by combining different partial solutions (Johannesson et al., 2013).

4.4.2 Brainstorming

Ideation is about generating, communicating and developing ideas (Jonson, 2005). There are many different methods to stimulate this process and different brainstorming methods are often used throughout the iterations of the design process. A brainstorming session often takes about an hour to finish and is performed in a group of three to six participants. The idea is to come up with as many ideas as possible - the participants can either write (Brainwriting) or draw (Braindrawing) their ideas individually and then everyone's ideas are collected (Österlin, 2016).

4.4.3 SCAMPER

SCAMPER can be used to combine and twist ideas to help you look at them from a different point of view. SCAMPER is a method that was originally created by Alex F Osborn and the name of the method is an acronym where each letter represents a word that can be used to help revive the creative thinking regarding an idea or problem. The words, or questions, can be used on their own or be combined and applied to existing ideas or problems (Johannesson et al., 2013).

S - Substitute

C - Combine

A - Adapt

M - Modify

P - Put to other use

E - Eliminate

R - Reverse

4.4.4 Prototyping

Prototyping is a method for developing and testing different ideas, which can vary in level of fidelity. Early on in the design process low-fidelity prototypes are usually used, sometimes in the form of paper prototyping. Here, different pages of an interface are shown on pieces of paper. Lo-fi prototypes are good for testing ideas and concepts early. In the later phases of the design process high-fidelity prototypes are more convenient as they show a closer resemblance to the final product. Look and feel, as well as functionality, interaction, and usability can be tested using these

(Hanington & Martin, 2012). Mid-fidelity prototypes would be placed between lo-fi and hi-fi prototypes as it has an intermediate level of fidelity.

4.5 Deliver

The last phase is called deliver. This is where the solutions created in the develop phase are tested and evaluated in order to discard those that does not work and keep improving the ones that does (Design Council, 2015), meaning that convergent thinking is applied as possible solutions are narrowed down.

4.5.1 Formative vs. Summative evaluation

Whether a formative or a summative evaluation should be performed depends on where in the design process you are. Formative evaluation is used to find problems in the design that need to be fixed, as well as what works and why. Based on these findings the designers then iterate and improve the product. Summative evaluations on the other hand, are performed to evaluate a finished product. The product is often compared to a previous version or a similar product belonging to a competitor. Some metrics, like the time it takes to perform a task, can be used in the evaluation. The summative evaluation is also used when deciding if a product is good enough for a release (Joyce, 2019). In short, the formative evaluation is used when the design is taking shape, while the summative evaluation is used when the design should be summed up (Hartson & Pyla, 2012).

4.5.2 Between-subject vs. within-subject tests

According to Charness et al. (2012), user tests can be performed in two different ways, either within-subject, when the same participant takes part in each test, or between-subject, when a participant only takes part in one test. There are pros and cons with both of these approaches. Between-subject tests reduces the risk of learning but it will not be possible for the participants to compare the designs and therefore they will not be able to have a preference. Within-subject testing has a risk of the participants learning how to perform a task and having to participate in several tests might be tiresome, but these participants can compare the different designs and give thoughts and comments based on their preference (Budi, 2018).

4.5.3 Positive Negative Interesting (PNI)

PNI is short for Positive, Negative, Interesting and according to Wikberg-Nilsson et al. (2015) it is a great way to get an overview of the concepts and how well they fulfill the requirements. The idea is to, for each concept, make a comment of the positive aspects, the negative aspects and what is especially interesting about it.

4.5.4 Think Aloud

Think aloud is a method, or protocol, that is great for evaluating interfaces. Jordan (2002) mentions that the participants can either be given the freedom to explore freely, or they can be given tasks to perform by using the interface. The idea is that the participants talk about what they are doing and about their thoughts when using the interface. Not only does participants communicating their thoughts verbally open up for a deeper understanding of what problems the participants have, but it also makes it easier to understand *why* these problems arise in the first place (Jordan, 2002).

4.5.5 Heuristic Evaluation

Heuristic evaluation is a method for inspecting the usability of a design. Elements of the user-interface are evaluated by experts, who check whether they are consistent with a specified set of usability principles, also known as heuristics (Preece et al., 2015). The process of a heuristic evaluation starts with the experts receiving instructions for what to do. The experts then start the individual inspection, usually lasting 1-2 hours and includes the expert to go through the interface at least two times. A particular task should also be provided for the experts if the evaluation regards a functioning product. The evaluation can either be documented by the expert themselves taking notes or think aloud, or an observer recording what problems have arisen. The last part of the heuristic evaluation involves a debriefing in which all experts take part in a collective discussion regarding what problems they found (Preece et al., 2015).

According to Nielsen (1994), several evaluators are needed since they usually find different problems. A recommendation is to use between three to five evaluators. Preece et al. (2015) further argue that having several evaluators help reduce the risk of the expert missing some important problems or reports something to be a problem when it in fact is not. Another way of reducing these risks is to use the heuristic evaluation in combination with some other method, like user testing (Preece et al., 2015).

4.5.6 Cognitive Walkthrough

Cognitive Walkthrough (CW) is a method for evaluating the usability of an interface. This method analytically evaluates the interface structure and the tasks to be performed (Bohgard et al., 2015). The participants of a CW is usually an expert investigator, however, the expert is making the evaluation as if they were a typical user (Jordan, 2002). Bohgard et al. (2015) explain that before conducting a CW one has to describe the human-machine system and the steps required to perform a specific task so that when one is conducting a CW one knows the “correct” way to perform the tasks. According to Bohgard et. al (2015) the goal of this method is to gain knowledge about whether the user will perform the correct action and if not, why. To do this, four questions are asked:

1. Will the user try to achieve the correct effect?
2. Will the user discover that the correct action is available?
3. Will the user associate the correct action with the desired goal?
4. If the correct action is performed, does the user get any feedback?

5

Execution and process

This chapter gives a detailed description of how this thesis was executed and how the methods described in chapter 4 are used and adapted. The execution and results of the user research will be presented first, which laid the ground for being able to identify guidelines. This is followed by the execution and result of the concept development which involves the four iterations leading to the final concept.

5.1 User research

Since there was no previous product to base the design on, a lot of time was spent investigating the problem and the needs of the users, as well as ideating on what solution could be the most appropriate to fulfil these needs. This project was initially based on the assumption that people's well-being suffers from working from home, thus there was a need to specify the core of the problem. To investigate how office workers experience the current situation of working from home, user studies in the form of questionnaires and interviews were conducted. The aim of these was to find out if these people really experience a problem and in that case what their needs are. What do people miss in the current situation compared to before the pandemic, and how do they hang out today? The participants also got to express their interests regarding activities and after work. Furthermore, their experience of physical activity during the pandemic was investigated.

5.1.1 Questionnaire

The user research started with sending out two questionnaires, one to employees at HiQ and one to the public. The questionnaires were first pilot tested before sending them out.

5.1.1.1 Pilot

A pilot test with seven people was conducted in order to check whether or not the questions were phrased in a coherent way. The test group consisted of our supervisor at Chalmers, our mentor at HiQ, both of which are office workers, one "regular" office worker and four students with experience of creating and participating in questionnaires. The pilot test participants were given a link to the pilot questionnaire and they could give their feedback as an answer directly to a question or in a final, free text, question. Based on the feedback from the pilot test some changes regard-

ing structure and wording of questions were made to make the questionnaire more coherent and to prevent misinterpretation.

5.1.1.2 Participants and structure

In order to reach as many people and different professions as possible the plan was to send the questionnaire to all the employees at HiQ as well as using social media such as Facebook and LinkedIn. To prevent irrelevant answers from people who are not in the target group the survey was named “Social interaction and physical activity among office workers” and a question about profession was included.

The questionnaire was anonymous and divided into three sections with different focus areas. The purpose of the first section was to ask some short warm up questions and collect general information about the participants such as age, profession and how many days per week they work from home on an average. This part mainly consisted of multiple choice questions or short text answers. The following section regarded the work situation and personal relations of the participants. The purpose of this section was to find out more about after work activity preferences as well as how they perceive the current situation. What are the participants missing the most about working at the office and is there something that works better now than it did before? The intention was also to gather information about how the social life of the participants has been affected by the pandemic and how that has affected their well being. This part mainly consisted of open, free text, questions since there was a need for more elaborate answers and qualitative data. The final section regarded physical activity and the aim was to find out more about the perceived daily physical activity among the participants as well as their aspirations. This section also included a short definition of physical activity to avoid confusing it with exercise. The participants had the possibility to add any possible clarifications or such in a final question and there was also a question where they could enter an e-mail address if they wanted to participate in further interviews. Entering an e-mail address affected the anonymity, however no answers were connected to a certain individual. The full questionnaire can be found in Appendix A.

5.1.1.3 Distribution of the questionnaire

The questionnaire was first published in a closed Facebook group called “Teknikkvinnor” as well as on the researchers’ private Facebook and LinkedIn profiles while waiting for access to the HiQ mail list. After two days the answers from the first 103 participants were collected. After reviewing these answers a decision was made to add two questions before sending the questionnaire to HiQ employees. These questions were added to the first section of the questionnaire and regarded whether or not the participants have any staff responsibilities, and if so, what actions they have taken in order to keep up the spirit and good relations since the start of the pandemic.

The second version of the questionnaire was then sent to all of the HiQ employees in Sweden by email. After one week both of the questionnaires were deactivated

to prevent any more people from participating. During this time, answers were continuously collected and added to digital sticky notes to even out the work load.

5.1.1.4 Analysis

The data collected from the questionnaires was analysed by using the KJ method. The two questionnaires were first analysed separately and the data was sorted into categories based on what question the data belonged to. The categories from the separate KJ analyses were then combined into one diagram. Almost 290 people responded to the questionnaires in total and due to the extensive amount of data gathered, another round of KJ analysis was performed where the categories were sorted into overarching categories. To avoid making the upcoming interviews too similar to the questionnaire the results from the KJ analysis were used to create mind maps that were based on the biggest of the overarching categories. These mind maps were created as a way to analyse the aspects that had been mentioned the most and to document what aspects required further research. These aspects were; talk and hang out, physical activity and being outdoors, wellbeing, and playing and competing.

5.1.2 Interview

In order to get a more in-depth view of the problem remote interviews were conducted. The aspects identified in the KJ analysis of the questionnaire were the main focus of this interview.

5.1.2.1 Pilot

A pilot interview was held with one participant to test the wording of the questions to make sure they were easy to understand, as well as to check the approximate time it would take. A meeting was also held with an employee at HiQ, giving some input on how to conduct interviews digitally. The advice given was to use some sort of props, such as emojis to capture emotions, or pictures relating to what is being discussed in the interview. By sharing the screen both interviewer and interviewee look at the same thing and the visuals complement the otherwise verbal only information exchange. This resulted in some changes to the interview, visualizing some of the questions instead of only asking them verbally. These changes were then pilot tested with another participant to check some technical aspects, as the visualizations involved the interviewers to share their screen.

5.1.2.2 Participants and setting

The interviewees were randomly selected from the questionnaire, where they had stated that they would like to participate in a follow-up interview. A total of six people were interviewed. They were all Swedish speaking, and therefore the interviews were conducted in Swedish. All interviews were held digitally through the video conference system Zoom, with the participants being in their own home. The

interviews were recorded to make sure no important parts were missed. All participants gave their consent to be recorded.

5.1.2.3 Interview structure

The format of the interview was semi-structured to allow for follow-up questions when the interviewee mentioned something that could be interesting to explore further (see Appendix B for interview script). It was important to let the interviewees speak freely whenever they thought of something that they would like to bring up, regardless of its relation to the question. Each interview lasted approximately 45 minutes. In addition to being recorded, one interviewer also took notes throughout the whole interview in case there would be some technical issues with the recording.

The interview started with a few demographic questions and then moved on to a warm-up section in which the participant was asked to briefly describe a normal workday. This was done to make the participants comfortable, as well as to get an understanding of what potential problems they experience relating to the topic of this project. The screen was shared and, in the online collaborative whiteboard platform Miro, the participant was shown a time line, ranging from morning to evening, with sticky notes attached to it. For each activity that was mentioned by the participant one of the interviewers wrote it down on one of the notes. After going through a whole day the participant was asked if there was something particular about the activities mentioned that they would like to highlight in some way by placing one of four emojis next to that activity. The emojis represented a range from very good to very bad. After the warm-up exercise the participant was asked some questions relating to inclusion of new people at work and their experience with videoconferencing tools. Following up on that the screen was once again shared, showing a number of people on computer screens. The participant was now asked to put together (through the help of the interviewers) as many computer screens as they thought was an appropriate number for a group, given the context of them hanging out with some friends. They were also asked about the reason for their choice and if there would be any difference if there would be no video, but only sound based communication.

The next part of the interview covered questions regarding digital group conversations as well as their attitudes towards hanging out with others digitally. After this the screen was shared a last time, now showing four questions regarding motivations and interests. The interviewee was asked one of the four questions at a time and for each thing mentioned one of the interviewers wrote it down on a sticky note placed next to the question. The four questions being displayed at the same time allowed the interviewee to add more things to the ones already discussed if they would like. When these four questions were answered a new section of questions regarding their experience of the pandemic situation were asked. Thereafter was a section relating to physical activity in combination with applications, and a section about important aspects when competing or playing. The participant was also asked to come up with ideas of what could be a fun activity encouraging socializing and physical activity. These would be used later in the process, when ideating around concepts

(see section 5.5.1.1). Lastly, the interviewee was asked about their thoughts of digital communication in the future. When the interview was finished they were also asked if they would like to participate in a potential workshop or user test later in the process of this project.

5.1.2.4 Analysis

All interviews were transcribed and later read by both researchers, marking relevant and interesting quotes. Using Miro, each quote was written down on a sticky note in a specific colour for each participant. These sticky notes were then sorted in a KJ analysis. The notes were grouped together based on similar content. These groups were then given a category name relating to the main theme of the respective group.

The results of the KJ analysis were used as the basis for the next step in the design process: creating personas and scenarios. Furthermore, the results were later used as input to a requirements specification, involving the appropriate number of participants in a digital hang out and what are important factors and aspects when competing, among other things.

5.2 Results from user research

Out of all respondents, about 90% said that they are socializing less or much less with other people, physically as well as remote, since the pandemic started. The majority of the repliers also mentioned that this is something that has affected them in a negative way. People mentioned feeling more lonely and less motivated. The questionnaires also included some questions about what kind of activities people enjoyed doing before the pandemic and what they enjoy doing now. Many people like meeting up for some food or a drink with friends or colleagues, or having food or a drink along with or in relation to engaging in an activity, for example shuffleboard or escape room. However, including food or drinks was too far away from the scope of this project. But reading between the lines, people like when they are given something to do when meeting up as that can provide them with a topic for conversation. This assumption is also strengthened by statements both in the questionnaire - people like after works that are activity based, and in the interviews - playing some sort of digital game with your colleagues as a substitute for the physical hang outs. The results from the questionnaires also showed that people feel less active now than before the pandemic started and also that they have a desire to be more physically active and spend more time outdoors.

What people miss the most are the social interactions with other people. During the interviews several participants brought up the fact that meeting digitally could be a great option if you can not meet in person. Based on the findings from this user research it was concluded that there is a need for people to interact with each other when the possibility to meet in person does not exist, both in the current situation and after the pandemic. As one interviewee put it:

"I have even managed to get my grandma and grandpa to have video calls with us, which is great, [...] even after the pandemic, so that I don't have to feel bad about not coming home to visit that often."
(Authors' translation).

The interviewees also stated that what makes an activity fun is the team spirit, to help each other out and compete together. Thus, this shows the relevancy of creating a product which combines social interaction and a team activity.

During the user studies it was also investigated what kind of activities people like, both remote and face to face, as well as what aspects are important in these activities. Quizzes, games (both online and board games), escape room and other "physical" activities were all brought up, and doing things together, such as team-building and solving "problems", were all found to be important aspects. Some stated that everyone should feel included and that the journey is the focus, while others really like competing.

On the interview question of how many participants is appropriate in a video or voice call when the purpose is to hang out the responses ranged from 2 to 10, but with most circulating around 4 to 8 participants. One participant stated:

"When there are 4-5 people we usually are able to have a conversation. If more people are joining then a couple usually just keep quiet because they don't really feel like they can take part of the conversation itself."
(Authors' translation)

5.3 Specification of requirements

This section describes the process of specifying requirements. First a set of personas were created which were then used together with context scenarios to identify and create a requirements specification.

5.3.1 Personas

All personas were based on findings from the user research. The interview results influenced the personas the most but data from the questionnaires was also used in order to bring some variation into the personas.

The steps of the method of constructing personas by Cooper et al. (2014) described in section 4.3.2 were followed thoroughly starting of by identifying several relevant roles such as family roles and attitudes towards relevant activities. After a short discussion, the role of "attitude towards doing something while taking a walk" was selected and the interviewees were grouped based on things that they had said regarding this subject during the interviews. This resulted in three roles:

1. Those who like listening to music/pod/audio book while on a walk and do it often
2. Those who sometimes listen to music/pod/audio book while on a walk
3. Those who never do anything else while on a walk, apart from talking to the people they might be on a walk with

Next, behavioural variables were identified for each role, focusing on these five variables:

- Activities
- Attitudes
- Aptitudes
- Motivations
- Skills

The set of behavioural variables of the first role can be seen in table 5.1, the second role in table 5.2 and the third in table 5.3.

Table 5.1: Behavioural variables for the role: “I like listening to music/pod/audio book while on a walk, and I do it often”.

Activities	Attitudes	Aptitudes	Motivations	Skills
• Exercise 3-4 times per week. • Watch TV every night. • Play computer games every other day. • Participating in courses, every other day. • Hang out with friends & family • Walk the dog every day. • Like to play boardgames.	• Working from home is fine but when it comes to socializing, I want to meet in person. • I don't like using my camera during online meetings and such.	• Have had digital meetings before the pandemic. • I have experience with apps related to physical activity.	• Getting to know new people. • Exercise to keep healthy and strong.	• Good at taking initiative to get together and do things. • Competitive

Table 5.2: Behavioural variables for the role: “Sometimes I listen to music/pod/audio book while on a walk”.

Activities	Attitudes	Aptitudes	Motivations	Skills
- Planting & gardening - Make my own games - Meeting with friends - Read books - Listen to pods	“Game lunches” are more flexible when remote since you don’t have to go anywhere. - Quizzes are usually not that fun when including general knowledge that I don’t know. - The journey is the goal - The gains of having the camera turned on outweighs the demands that comes with it	Have participated in activities for getting exercise, through work.	- Exercising can yield more ideas - Gamification - Socializing with people gives me energy	- Making games - Good at taking initiative to get together and do things.

Table 5.3: Behavioural variables for the role: “I never do anything else while on a walk, I just walk or talk to the people I’m walking with”.

Activities	Attitudes	Aptitudes	Motivations	Skills
- Hang out with friends/family - Gardening	- Hates losing - Remote socializing is great when the distance is long and you are unable to meet in person. - Meeting in person feels better due to my personality. - Have always promoted video conference tools. - Voice calls should only include 2 people. - Group discussions should involve participants having their camera turned on. - Loves apps. - Playing games with friends in other cities can be done remotely after the pandemic as well. - Everyone should have fun and be included in games. - A potential app should be easy to use	- I’ve been using video conference tools for many years, both for work and socializing. - I have talked a lot to my family via messenger.	- Using my brain and body gives me energy. - Colleagues contribute to the creativity. - Exercise to stay healthy.	Competitive

The identified behavioural variables were then converted into likert scales so that the interviewees could be mapped against each variable. Using the mapping, clusters of

interviewees could be identified. Figure 5.1 shows four of the 32 likert scales as well as how the interviewees are mapped against the variables and then clustered. As mentioned in section 4.3.2, if a set of interviewees cluster on six to eight variables they are likely to represent a significant behaviour pattern. This resulted in 5 different significant behaviour patterns being identified.

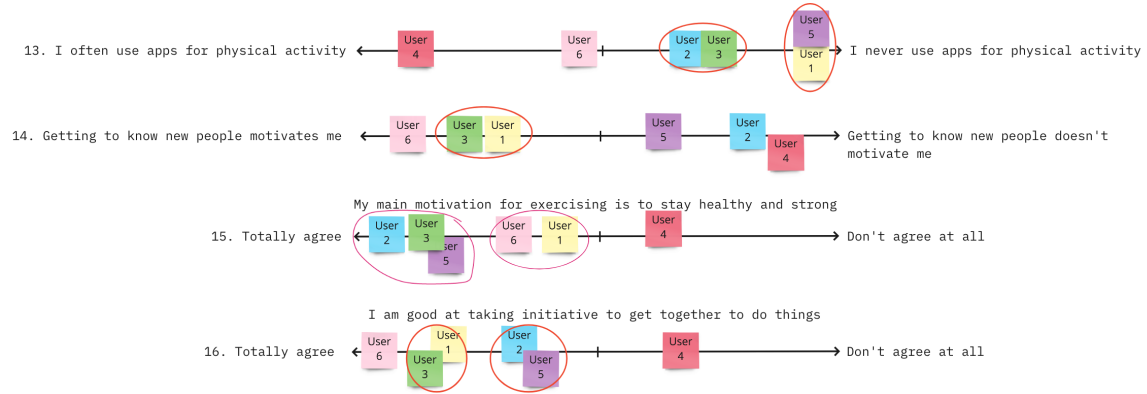


Figure 5.1: Mapping interviewees against behaviour variables.

Based on the data collected during the interviews details for each significant behaviour pattern was synthesized in order to provide each persona with a set of characteristics and goals. Two of the personas ended up having very similar characteristics, thus data collected during the questionnaires was used to modify and complete the persona characteristics and goals.

The next step in the process of creating personas was to designate persona types. This was done in order to prioritize the personas so that the primary persona, i.e. the primary target, could be determined. The process led to five personas, one of them was selected to be the target persona, one was selected to be the secondary persona and the other three were selected as supplemental personas. The secondary persona is someone who is overall satisfied with the desired interface of the primary persona while the needs of the supplemental personas are represented through a combination of the secondary and primary personas. Short narratives were then created for each of the five personas and they were given names as well as a picture. The set of the final personas can be found in Appendix E.

5.3.2 Requirements specification

When defining the requirements, the process described by Cooper et al. (2014) (see section 4.3.3) was followed. However, according to Cooper et al. (2014) the last three steps of the process are often iterated several times, something that was not done in this project due to shortage of time. The first step was to create a problem statement as well as a vision statement.

Problem statement: HiQ has noticed that their staff are unmotivated because of the constant online meetings and there are no clear boundaries between work life and free time. Also, the staff does no longer have the possibility to meet in person

to socialize and ask spontaneous questions about work, or everyday life, since they are recommended to work from home. The majority of the staff at HiQ are office workers meaning that they have a sedentary work life in general, but some even more during the pandemic since they do not have to travel to/from work.

Vision statement: The new product will help users to keep in touch and socialize with friends, family and colleagues by allowing them to work in teams and giving them a topic of conversation, in an easier way, even if not being in the same city or being able to meet in person. The product will also help users increase their physical activity as well as spending more time outdoors, utilizing the social interaction as a distraction from the physical activity, by providing tasks and activities to be performed by the users.

Next, a short brainstorming session was conducted in order to eliminate any preconceptions about possible solutions. The primary and secondary persona were used in order to identify any expectations they might have concerning the product. A context scenario was created for the primary as well as the secondary persona to illustrate the context of use for these two personas. The two context scenarios were created based on the questions listed in section 4.3.3 and can be seen in Appendix F.

Lastly, a set of requirements was identified based on the personas and context scenarios, which in turn are based on data collected during the user research. This set of requirements was documented as a list and divided into three categories:

- User requirements
- Design / technical requirements
- Ethical requirements

The requirements specification consist of functions that are either something that is needed or desired and each requirement was weighted on a scale from one to five based on importance. The final list of requirements can be seen in Appendix D.

5.4 Guidelines

Based on the user research and requirements specification list, seven general guidelines were identified, describing the most important aspects to consider when creating a design intended to increase social interaction and physical activity. For a complete description, see section 6.1.

5.5 Concept development

The following sections describe the process of developing a concept as a way to explore how the identified guidelines can be put into practice.

the interviewees, the decision was made to set the top limit of 6 participants being able to take part in the same session. Thus, this number was an average of what the interviewees had stated.

During the KJ analysis, two distinct categories regarding the theme of activity were revealed: receiving questions, and performing a physical task (such as doing a number of squats, or collecting things from the environment). Both of these categories involved the users to be outdoors during the activity.

5.5.1.3 First evaluation

In order to evaluate the concept ideas a verbal PNI was performed where positive, negative, and interesting aspects about each concept were discussed and compared.

The PNI resulted in the conclusion that physical tasks, although fun, could be more complicated since it requires a leader or judge of the activity - something that collides with the fundamental idea of everyone being able to participate on the same terms, which is also one of the identified guidelines. If there would be no judge it would require every participant to be very honest, something that is hard to control for. Therefore the decision was made to continue with the idea of the participants receiving questions that could be automatically corrected. This further sparked an idea of a digital quiz walk with a twist.

5.5.2 Iteration 2

The aim for the second iteration was to investigate how a digital quiz walk can be designed to fulfil the needs discovered. If it should differ from already existing products it should involve something more than just a number of multiple choice questions. Henceforth, the concept of a digital quiz walk will be referred to as "game".

5.5.2.1 Define

To define how the process of using the product would look, a mapping of the top level steps of the interaction was made. This gave a brief overview of what the main steps are for the user. Eight different steps were mapped (see Figure 5.3).

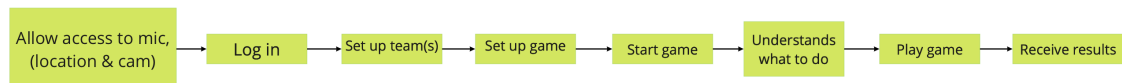


Figure 5.3: Mapping of the top level steps of the interaction.

Since the activity is performed remote the users should be able to synchronously communicate with each other, and therefore they have to allow access to microphone. The interviews indicated that communication was aided if the respective parts were able to see each other, strengthening what was found during the literature review. If this function is to be provided the users also have to allow access to their mobile

phone camera. Furthermore, the questions are meant to be related to the users moving in some way, and thus access to their location could be needed. In order to end up in the correct session, with the right people, the user also has to log in somehow. The next step is to set up a team (or several teams if there is a big party). After that the game itself should be set up involving different kinds of choices provided to the participant. The main activity of the game should then be started, and the users should get enough information to understand what they are supposed to do. The next step is for the users to actually play the game and after that receive results regarding the gameplay session.

5.5.2.2 Ideation

A brainwriting session was conducted for each of the top level steps in order to produce different ideas of how each step could be performed. The session was conducted digitally in Miro by the two researchers, via Zoom. A board was created for each step, containing the name of the step placed in the middle of the board, creating the center piece of a mind map (for an example, see Figure 5.4). Having the structure of a mind map allowed for easily connecting ideas that were related to each other, giving it a straightforward overview. Each idea was written down on a digital sticky note and linked to either the center piece or to a related idea. Both participants could see each others' notes during the whole session and could therefore elaborate on, or get inspired by each others' ideas.



Figure 5.4: Brainwriting of one of the steps in the form of a mind map.

When brainwriting on the set-up team(s) step, it became apparent that the com-

plexity of having more than six participants, and thus having to divide the group into several teams, was very high. Many solutions to how this could be done were suggested but incorporating this would also require a lot of iterating. Due to the increased complexity it was decided to not continue developing this part of the concept, although being a group of more than six people should still be a possibility in reality. It was also considered to be more important to focus on the main activity itself, and not spend too much effort in trying to solve the set-up phase, which was another reason for not moving forward with this aspect.

The brainwriting session laid the ground for which functions should be brought into a morphological matrix.

5.5.2.3 Early concepts

A morphological matrix was set up with the functions discovered in the brainwriting session. A total of 18 functions were included in the matrix and each function had two variants or more (see Appendix G for the full morphological matrix). Since there was not enough time to prototype every combination of each function's variants it was decided to generate four different concepts: three randomized, and one dream concept, that is, a combination of variants that the researchers thought could be the best. Each concept consisted of one variant from each function and is presented in Table 5.4.

Table 5.4: A presentation of the generated concepts and their functions.

Function	Concept 1	Concept 2	Concept 3	Dream concept
Invite players	Pick own code	Link	Autogenerated code	Autogenerated code
How to share	Manually	Manually	Share through product	Share through product
Enter name	Retrieved from Google/FB	First name + surname	Nickname	First name + surname
Avatar	No avatar	No avatar	Pick an avatar	Pick an avatar
Team name	Auto generated	Auto generated	Enter own name	Auto generated
Who sets up the game	Team makes choices together, only one can make input	Team makes choices together, only one can make input	Session creator makes all choices when session is created	Session creator makes all choices when session is created
Customize game session	No. of tasks + length in km.	Length in km	No. of tasks + length in hours	Length in hours
Game start	Game is running as players join	All players have to press "start"	One player starts the game	One player starts the game
Show that you are supposed to walk	Text instructions only	Real map with route	Fictional map with route	Real map with route
Responsible for task input	Random person every time	Random person every time	Turn-based	Turn-based
What triggers a task to appear	The last person to walk x no. of steps	The first person to walk x no. of meters	After x no. of collective steps	After x no. of collective meters
How to answer a question	Text input	Text input	Multiple choice	Multiple choice
What do you get if correct answer?	Text clue, quicker answer → better clue	Get a text clue	Fixed no. of points	Get a picture clue
How do you win?	Most points	Fastest answer to a final question/task	Longest distance walked	Most points
The actual task	Questions with increased difficulty, based on participants' location	Start with a number of points, bet points on each question	A set of questions that all has to be answered (like jeopardy or smarter than a 5th grader)	Select between 3 categories
Time limited tasks	No	Yes	Yes	Yes
When can users see scoreboard?	Only after the game has ended	Only after the game has ended	"Live up-dated" as the game unfolds	Only after the game has ended
Possibility to see other data	Only after the game has ended	Not at all	During the game	Only after the game has ended

5.5.2.4 Prototyping

The four concepts produced in the morphological matrix were then sketched on paper, as lo-fi prototypes, in a braindrawing session (see Figure 5.5). Initially 1.5 minutes were set for each function of the concept to be sketched. However, this was later altered since many functions related to each other and were therefore sketched multiple times within the same concept, leading to extra work. The alteration resulted in each concept being sketched within the time limit of 20 minutes. The reason for having a short time limit for each concept was to not overthink the ideas, but to sketch the idea that was top of mind. When sketching, some of the sub-functions appeared to collide with each other, making them hard to combine in a logical way. An example of this was the function "how do you win" for concept 3 in which the team who walks the longest distance would win. This was hard to combine with the distance being the trigger for the questions and there being a fixed set of questions. With the latter two functions in mind, the distance would always be the same for all teams.

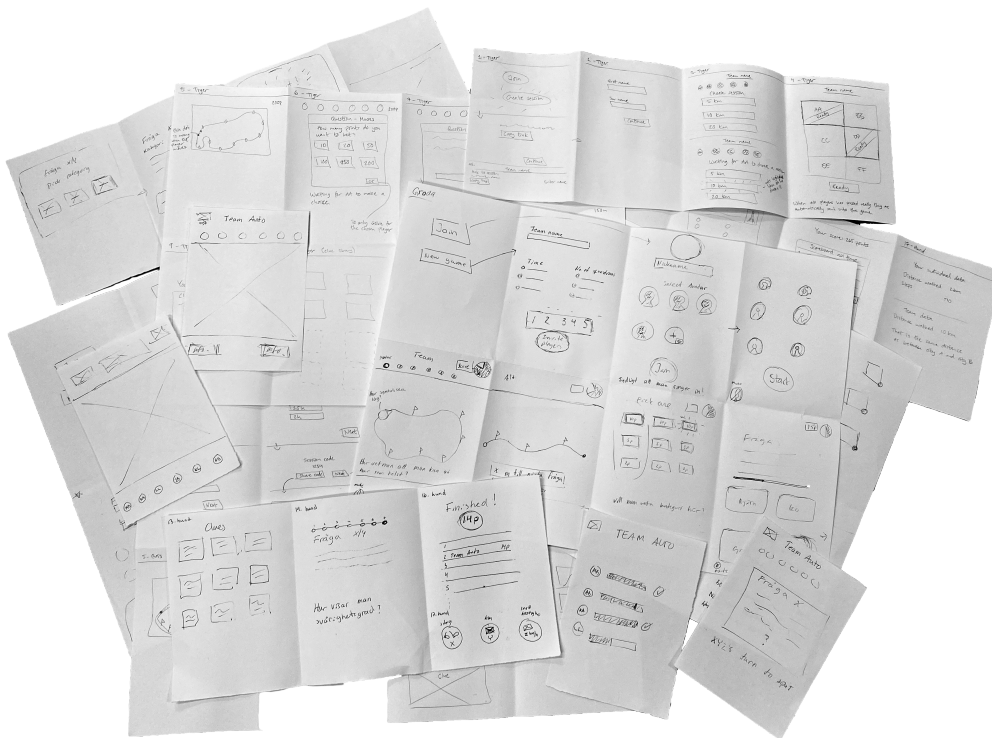


Figure 5.5: Lo-fi prototypes sketched on paper.

During the creation of the prototypes it became apparent that there was a need for talking to users regarding some of the functions. Not all four concepts could be prototyped further, therefore a decision had to be made of which concepts to discard and which to continue with. This was considered to be a big decision and therefore users had to be brought in to give their input. Several different lo-fi prototypes were created in Figma for each function that should be tested.

The first function regarded the main activity of the game: what it could look like when users receive a question. Here five different suggestions were sketched (see Figure 5.6). The suggestions were based on the resulting concepts of the morphological matrix, with one concept resulting in two variants of the same idea. The five suggestions were:

1. A category is presented and the users receive a question within that category.
2. Three different categories (each worth the same points) are presented and the users get to choose one of them.
3. Three categories (each worth different points) are presented and the users get to choose one of them.
4. The users receive a fixed set of categories (worth different points) in the beginning of the game and get to choose in which order they want to pick the categories.
5. A category is presented and the users has to choose how many points they want to bet on that category - if they are right they receive the points they bet, if they are wrong they loose the points they bet.

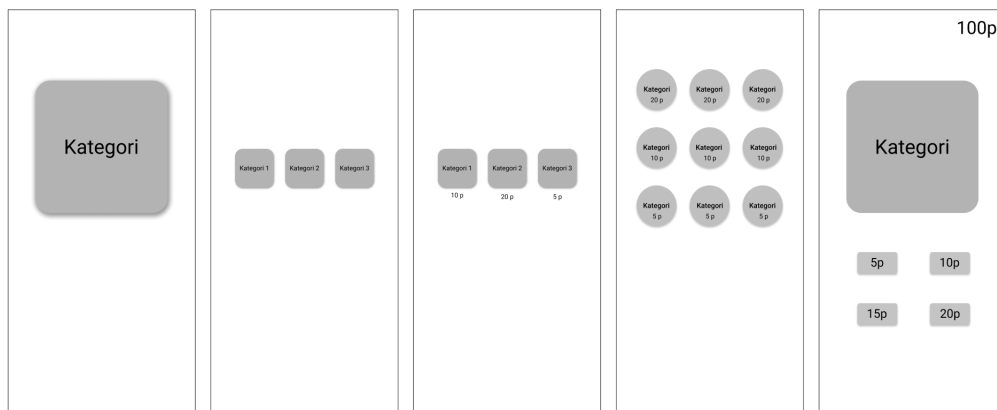


Figure 5.6: Five suggestions on how it looks when users receive a question.

The second function that needed user input was what kind of reward the users would get for answering correctly. Based on the concepts from the morphological matrix four different suggestions were sketched (also see Figure 5.7):

1. Users receive points only.
2. Users receive a text clue.
3. Users receive a better/easier text clue the faster they answer.
4. Users receive a picture clue.

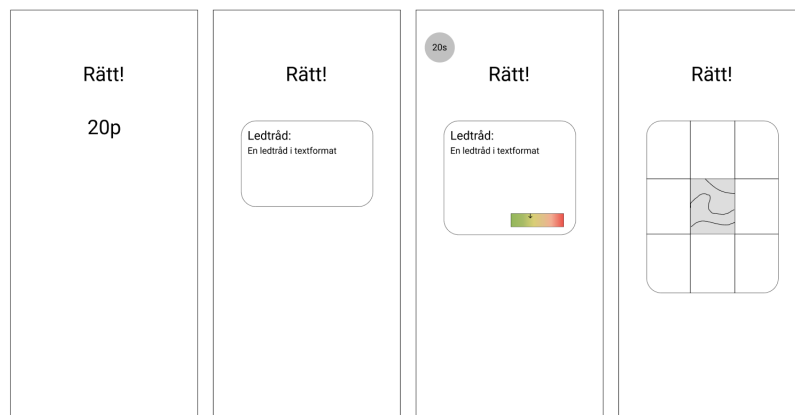


Figure 5.7: Four suggestions on what kind of reward is given for a correct answer.

Lastly, the type of input on a question was tested with the users. Two different suggestions were made (also see Figure 5.8):

1. Free text input.
2. Multiple choice with x number of alternatives.

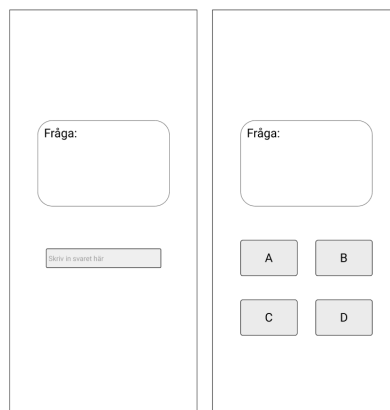


Figure 5.8: Two suggestions on how input to a question should be made.

The reason these two suggestions were tested was that there is a trade-off between them. Providing alternatives opens up for guessing, giving the users eg. 25% chance (if having four alternatives) of getting the answer right even if they don't know the answer. This could potentially make the users perceive it as less interesting since you could guess the right answer anyway. If instead free text input would be used, there is a risk of getting the answer wrong because of misspellings or auto-correct. Here, users might get frustrated when knowing the answer but spelling it wrong. Thus, the trade-off regarded if the multiple-choice would be too boring since it allows for guessing, or if the free text input would bring too much frustration for incorrect spellings.

5.5.2.5 Second evaluation

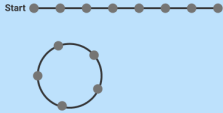
A big part of the concept regards how to visualize the user's progress towards receiving the next question. Three suggestions; text only, fictional map, and real map, had been extracted from the morphological matrix, and to evaluate these a PNI was conducted.

The lo-fi prototypes created in Figma were formatively evaluated with the help of five potential users from different age groups. One of the participants were non-Swedish speaking and therefore that evaluation was conducted in English. All other evaluations were conducted in Swedish. Due to time limits one participant only evaluated the alternatives for receiving a question. Two participants took part physically and were seated in front of a big screen on which the different suggestions were shown. The other three tests were held digitally through Zoom in which the screen of one of the test leaders was shared with the participant, showing the suggestions. Before the suggestions were shown a short text describing the context was read to the participants. The users were then asked to look at the different "question alternatives" and state which one they would prefer and which alternative they think would encourage the social aspect the most. Since the suggestions were rough prototypes the test leader also explained how they would work. After this the users were presented with the "reward alternatives" and asked which one they think would be the most fun. Lastly, they were shown the two input alternatives and asked which of them they preferred. In every test, the alternatives were presented in a different order to avoid order effect.

5.5.2.6 Results of second evaluation

The PNI (see Table 5.5) resulted in the text only suggestion to be discarded as there was a risk of there being too much text, resulting in "text overload". Further, there is a difficulty in communicating distance in text when the collective distance is what triggers a question to appear. One example could be to display "500 meters left", but the users need to know that this is the collective distance, and it might be hard to get a good grasp of what that means regarding how far a single individual has to walk. The individual distance to a question would be hard to predict as everyone walks in different speeds, and therefore it could be hard to show. The other two suggestions both had positive and negative aspects. A fictional map would not require access to users location, but here the user is not provided any guidance of where they are and could thus end up at the other end of the town when the game is finished. With a real map it would be easier to end up on your starting position when finishing the game, however it is hard to show the location of the user since the group's distance is what triggers a question. The map would show where the next question is located, but in this case the user's might reach this location but still not get the question since the team might not have walked the required distance yet. Because of the latter the fictional map was considered to be somewhat better, but not so much that it clearly outweighed the real map. Therefore it was decided to bring both alternatives to the next step, making use of user input to make the decision.

Table 5.5: The PNI made of the three suggestions of how to visualize the user's progress towards receiving the next question.

	Positive	Negative	Interesting
Text instructions only	- Doesn't require access to location services - Clear that you can walk wherever you want	"Text overload" - Hard to communicate distance to next question in text when the collective distance is what triggers a question	Might differ from other navigation apps that people use
"Fictional" map 	- Doesn't require access to location services - Visualizes progress - Can play while moving elsewhere (doesn't have to walk back to the starting position)	- Hard to know that you can walk wherever you want - Can end up in the other end of town (is not walking back to the starting position)	User can understand that they should turn around when they have completed half of the questions
Real map 	- Visualizes progress - Easy to get back to the starting position	- A route has to be provided (can you be located anywhere?) - Hard to show the position since the group's speed is what counts	Maybe this feels more reality based

All five users stated that they think "betting points" sounds like the most fun and also that it would encourage discussion within the team more than the other alternatives. A majority of them also thought that having the questions leading up to some kind of final task would be fun, especially if you're not playing against other teams. When presented with the different alternatives of what to collect from each question the majority leaned towards some kind of picture clue and they had many ideas of what the final task could be in that case. One of the users had a suggestion of everyone in the team getting different picture clues to the same picture, or getting different pictures all together. Then they would have to describe to their team members what they are seeing. According to the participant that could be fun and engaging.

Regarding type of input on the questions, users brought up the fact that there is a risk of misspellings in the free text alternative. Here it was also mentioned that users who don't know the answer would have no idea what to write and could therefore get bored if they get a couple of questions in a row that they don't know the answer to, and so might want to quit the game. Furthermore, one participant expressed that free text input might be better suited when the answer is in numbers and not text, so it depends on what the question is about. All participants stated that they liked the multiple choice version better.

The evaluation with the users resulted in two concepts being most prominent: one

in which the main focus is the betting of points for each question, and the other in which the main focus is receiving a picture clue for a correct answer (see Figure 5.9). In both concepts the input type was set to be multiple choice.

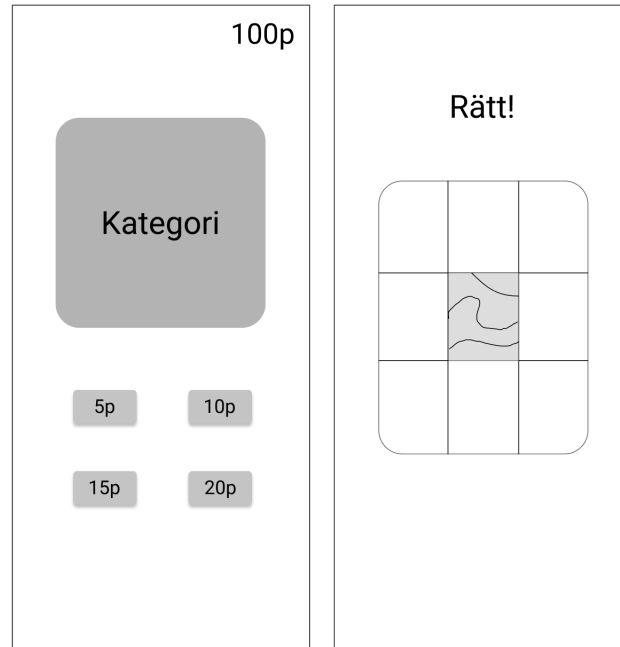


Figure 5.9: The 2 winning concepts of the evaluation.

5.5.3 Iteration 3

In the beginning of the third iteration, the flow of the two concepts were defined using a user journey map, which was later used to ideate on how the different frames of the concepts could look. Mid-fi prototypes were created using Figma and these were then tested and evaluated with users.

5.5.3.1 Define

In order to get a better understanding of what each step of the interaction would involve in general, a user journey map was created. This included specifying in what context each step would take place, the user's action, interactions that are visible to the user, as well as interactions that appear "backstage" and are not visible for the user. The template used was created by UX honey¹ and also contained a mapping of the users feelings along the journey, something that is usually included in a user journey map, see section 4.3.4. However, this was not included, rather, this user journey map focused on the main actions to be performed in each phase and their related interactions. The identified phases included what happens before the actual game has started, for example what actions are performed when creating or joining a new game session. The second phase is during the game and involved actions

¹www.uxhoney.com

5. Execution and process

about the actual game play and the third phase covered actions to be performed when the game is finished.

When creating the user journey map one function that had not yet been defined was what settings the user should be able to make when creating a new game. Therefore a decision was made to give the user the possibility to pick between different modes based on number of players and also to select the length of the game by picking the number of questions to answer through the game. These decisions were made based on what would fit best with the main functions of the two concepts that were set during the previous iteration. Many different possible settings had been discussed earlier but according to Cooper et al. (2014) less is more when it comes to interaction design. Therefore a decision was made to try to minimize the number of elements, thus limiting the settings possibilities and later test whether it is enough.

Goal: *Create and play session*



Figure 5.10: User journey mapping.

5.5.3.2 Ideation

After the user journey map had been created, a brainstorming session was conducted. The ideas generated during this stage were based on the phases and actions of the user journey map and the sketches made during the previous iteration. A lot of thought was put into how to design in order to fulfill the needs and requirements identified during the user research, hence some questions arose, such as:

- *How do you make it clear for the users who is responsible for making the task input?*
- *How do you make it clear for the users that they are supposed to walk, that they can walk in any direction and that it is the collective distance of the team that triggers questions?*
- *How do you make it clear for the users that they are supposed to help out through every step of the game?*

This braindrawing session was conducted in order to ideate on what the different frames of the game might look like for the two different concepts. The braindrawing session took place in Figma and the wireframes corresponding to each action or phase of the user journey was created and iterated (see Figure 5.11 for examples of different ideas of the betting page). Both researchers worked simultaneously in the same file and got inspiration from each others' wireframes and the focus was to create certain components in order to optimize the user experience and usability, as well as how to show the progress.

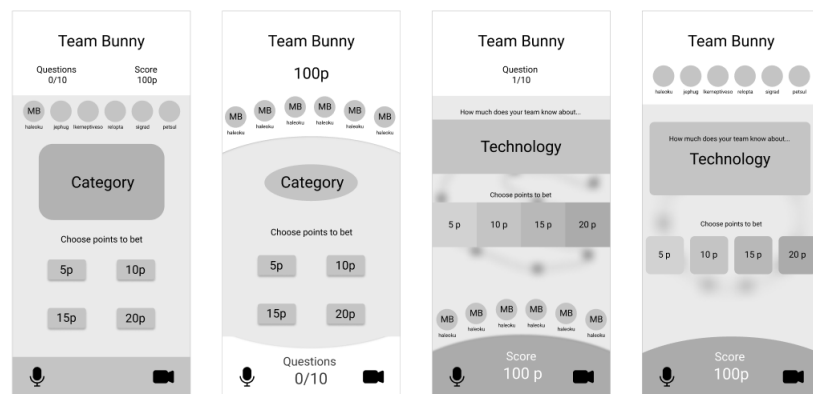


Figure 5.11: Four different suggestions of how the betting page might look.

5.5.3.3 Prototyping

The next step was to summarize the wireframe ideas from the braindrawing into two mid-fi prototypes. Wireframes from the braindrawing was selected based on what aligned most with the identified needs and requirements as well as existing conventions and design principles. The prototypes were made partially interactive and some basic transitions were also included to prevent the prototype from becoming too static. However, every possible interaction was not prototyped.

The two concepts

The two defined concepts work and look the same in the pre-game and after game phase, but during the game, one concept is based on betting points and the other one is based on collecting clues.

Concept: Betting

The first concept was prototyped based on the user being the one who is creating a new game and inviting others to play as well as being the one who makes the input during the game, to test those scenarios. On the set up-frame it was made possible to select a certain number of questions but only one question using the betting concept was prototyped. Since a decision had not yet been made on how to show the progress of the game, ergo, what type of map to use, the first concept was prototyped with "real map".

Concept: Clues

The second concept was prototyped based on the user being invited to join a game session and not making any inputs during the game to be able to test those scenarios. This concept also only included one prototyped question but based on the clue-collecting concept. This concept was prototyped with a fictional map representing and visualizing the progress of the game so that the different map variants could easily be compared during the evaluation.

5.5.3.4 Results from prototyping

The two prototypes are described very briefly in this section as the foundation of it can be seen in the final concept (see section 6.2) where each page is described more thoroughly. Some of the pages are also the same for both prototypes and the focus of this section is to explain the difference between them.

The player has two possibilities when opening the application: they can either create a new game or join an already existing one (see Figure 5.12). Three different modes are available depending on how many players there are. In this prototype only 2-6 players was further developed since being more than 6 players require a more complex solution to dividing up the group into several teams (as mentioned in section 5.5.2.2). A single player mode was also included as there could be players wanting to play on their own as well. In the rightmost page the team name is also shown at the top. This name is automatically generated since the aim is to keep it simple and not include too many inputs from the users. Following the pages in Figure 5.12 the player clicks on "create game", chooses number of players, chooses number of questions, receives a code which they can send to others, enters their name, and finally joins the session.

5.5.4 Concept: Betting

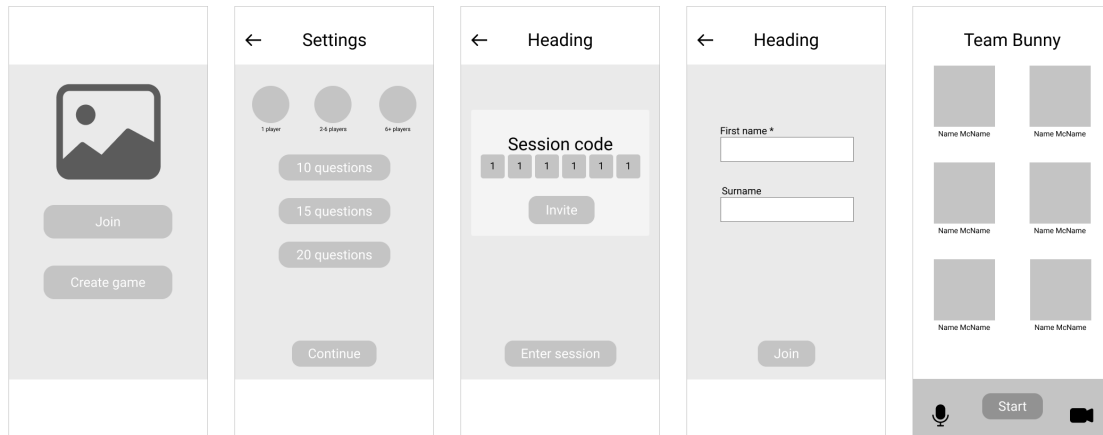


Figure 5.12: Pre-game in concept betting.

In this betting prototype the team starts with a specific number of points which they can later use for betting. When first entering the game the players see a map (shown in Figure 5.13) and their position on it. The map shows the surroundings and when the player moves, a line is drawn along the path that the player has taken. On the bottom left of the map a circle is ticking up, visualizing the team getting closer to the next question. When a question has been answered it is marked as correct or wrong on the map using a check mark or a cross, respectively. The player is also able to swipe and zoom in or out on the map, and therefore the arrow in the top right corner is included. By clicking on it the player is sent back to see their current position on the map.

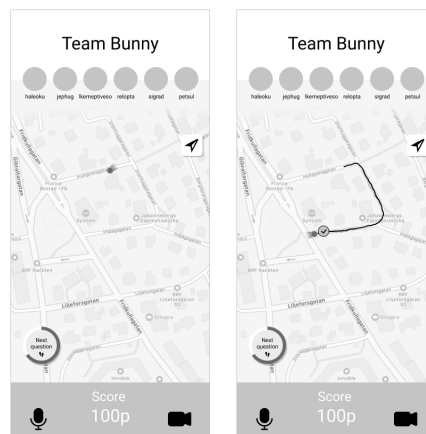


Figure 5.13: The map showing where the player is located.

When receiving a new question the team has to choose how many points they want to bet (see Figure 5.14). This choice should be discussed together in the team. After this a question is presented that the team should answer together. There is a time limit on the question, however this time limit is long. The intention is not to put

stress on the players, but rather to hinder them from discussing, or getting stuck on, a question for a very long time.

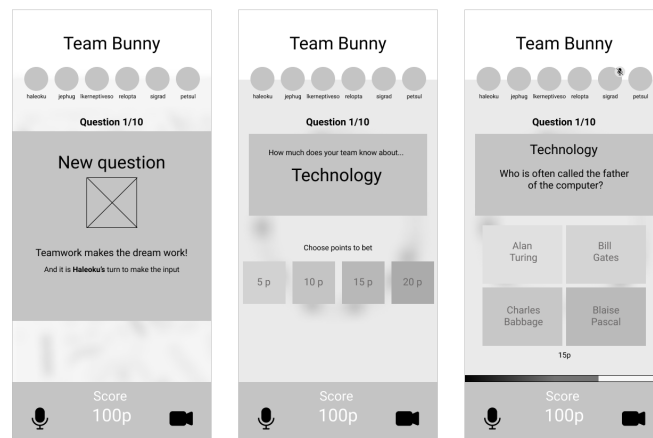


Figure 5.14: Receiving a new question.

If the answer was correct the team receives the points they betted, but if the answer was wrong they loose the same amount of points (see Figure 5.15).

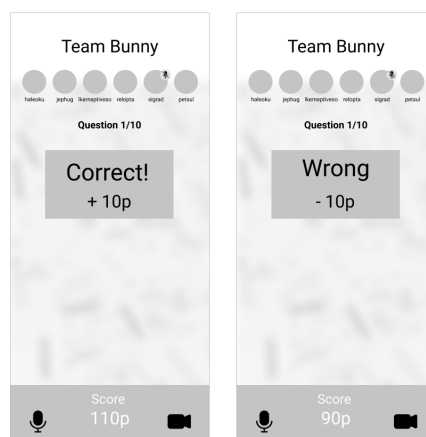


Figure 5.15: Page showing whether the answer was correct or wrong.

After finishing the game the team's final score is presented. Following the final score page is a scoreboard in which they can see their result in relation to others, and the page after this shows how far they have walked - both individually in number of steps and distance, and as a team in distance (see Figure 5.16).

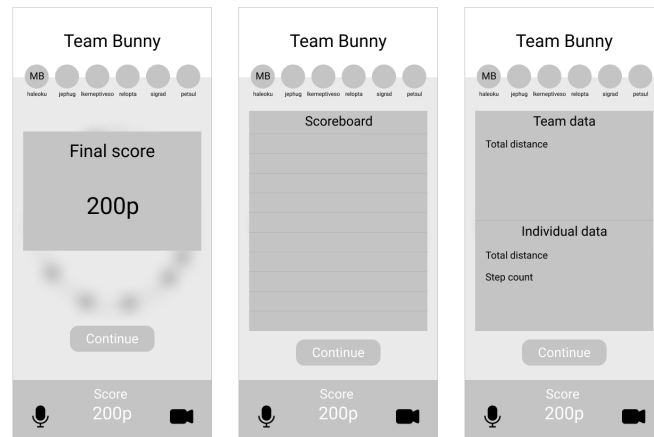


Figure 5.16: Post-game in concept betting.

5.5.5 Concept: Clues

Some of the pages in this concept are the same as in the previously described betting concept.

Following the interactions on the pages shown in Figure 5.17 the player first clicks on "join" and is then taken to a page where they can enter or paste a code. They enter their name and are let in to the session.

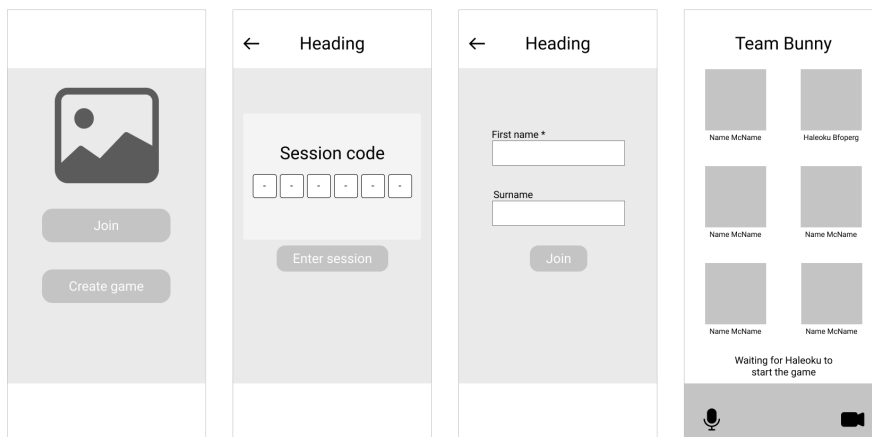


Figure 5.17: Pre-game in concept clues.

In this version the team has a starting score of 0 points. A circular map visualizes the route to be walked during the game and also if an answer was correct or wrong (see Figure 5.18). When getting to a new question the team has to choose one of three categories that they want to get a question on. The categories are also worth different amount of points. After this they receive a question belonging to the chosen category.

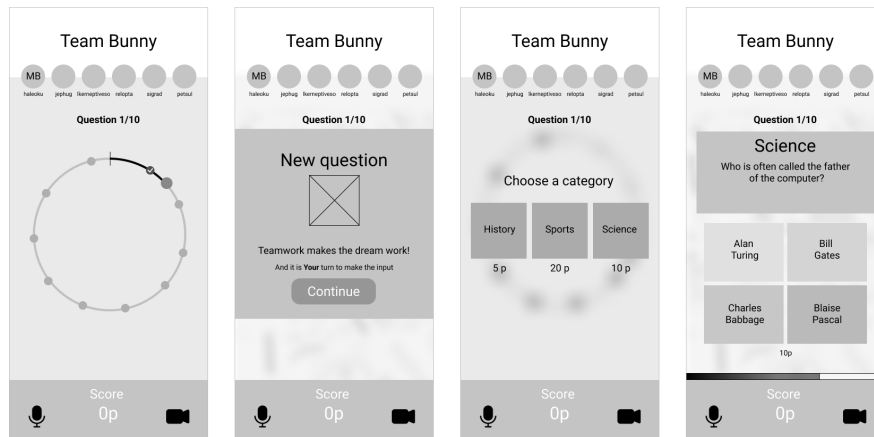


Figure 5.18: Map and receiving a new question.

Depending on whether the answer was correct or wrong the players see one of the two pages shown in Figure 5.19. If the answer was correct the team receives the points for that question as well as a picture clue. If the answer was wrong on the other hand, they receive no points (but do not lose any points as in the previous concept). The players can also see that they missed a clue.

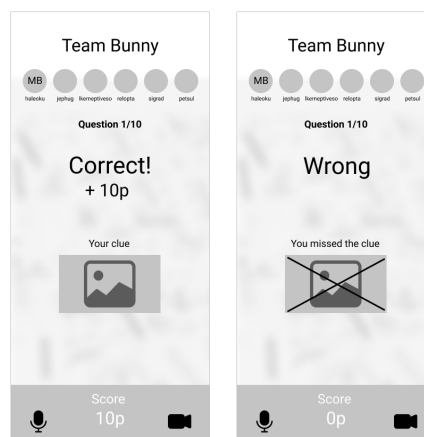


Figure 5.19: Page showing whether the answer was correct or wrong.

When having completed the route the whole circle is filled. The team then receives a final question relating to the picture clues that has been gathered throughout the game (see Figure 5.20). The players can at any moment in the game look back at the clues they have already collected by going to the clue library. Here all clues gathered are displayed, and the clues missed by giving the wrong answer to a question are crossed out. Additionally, the total number of clues that can be gathered can be seen as each clue has its own place in the library. The clue library can be seen in the right page in Figure 5.20.

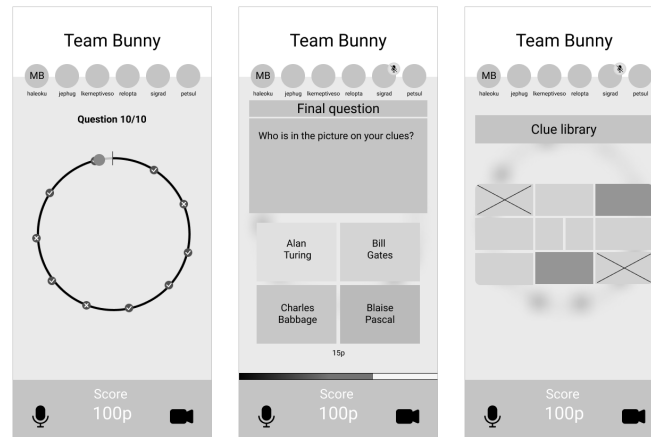


Figure 5.20: Map when the route is almost completed, receiving the final question, and the clue library.

Just as in the previous betting concept, after the game is finished the team receives their final score, a scoreboard, and individual and team data (see Figure 5.21).

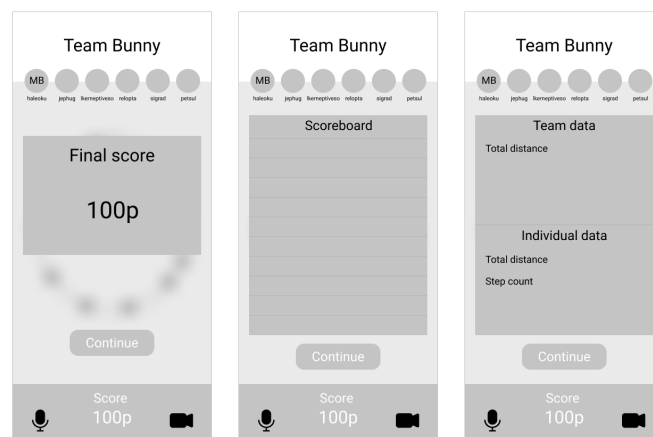


Figure 5.21: Post-game in concept clues.

5.5.5.1 Third evaluation

The two prototypes were then evaluated with users, once again using formative evaluation. This was a within-subject user test, meaning that all participants tested both prototypes. Four users participated in the test, three of the tests were conducted face to face while one was conducted remotely through Zoom. Due to the current pandemic the researchers wore face masks and this was also provided to the participants if they did not bring their own. Hand sanitizer was also provided and all equipment was disinfected prior to and between the tests that were conducted face to face.

Before each test the purpose and layout of the test was read out loud to the participants and then they got to sign a consent form agreeing to the terms. The consent

form that was used can be seen in Appendix I. During the remote user test the consent form was shared to the participant's screen so that they could read it and then they gave verbal consent to the terms. During each test the voice of the participants, as well as the screen that they interacted with, was recorded, something that was included in the consent form.

When testing several things during one test there is always a risk of a biased result due to the order effect. The order effect is a phenomenon where the order in which two suggestions is presented may impact the result (Strack, 1992). In this case, the participants might perceive a concept differently depending on whether or not they have seen the other concept first. In order to counterbalance this the participants were presented with the prototypes in different orders where two of them got to interact with the betting concept first and then the clues concept, and the other two participants got to interact with the prototypes the other way around. The users who participated face to face were handed an iPhone on which the prototypes were mirrored from Figma, leading to the test being conducted on the intended device, while the person participating remotely got to interact with the prototypes on a computer screen. This was made possible by sharing the screen in Zoom and handing over the control of the mouse pointer to the test participant.

The participants were asked to think aloud while interacting with the prototypes in order to better understand their thoughts and feedback. Before being presented with the prototypes the participants were given a context scenario corresponding to each concept. These scenarios can be seen in Appendix H. The interaction with each prototype was followed by a short questionnaire consisting mainly of likert scales of how different aspects were perceived (see Appendix J). This questionnaire was inspired by the method Heuristic Evaluation (see section 4.5.5) by creating likert scales based on Nielsen's ten usability heuristics (see section 3.3.4.1) and Norman's seven design principles (see section 3.3.3).

In addition to the two prototypes the participants were also presented with three different map solutions and were asked to give feedback on which one they preferred and why (see Figure 5.22). The first map was a real map on which the users could see their position in relation to things in the environment such as roads, houses, etc. The second map was a circular representation of a route with dots representing stops (questions) spread out along the way and a bigger dot showing their position. These two maps were included in one of the prototypes respectively. The third map however was not included as it was quite similar to the second map. The difference was that this one was a representation of a route made in an *irregular* form.

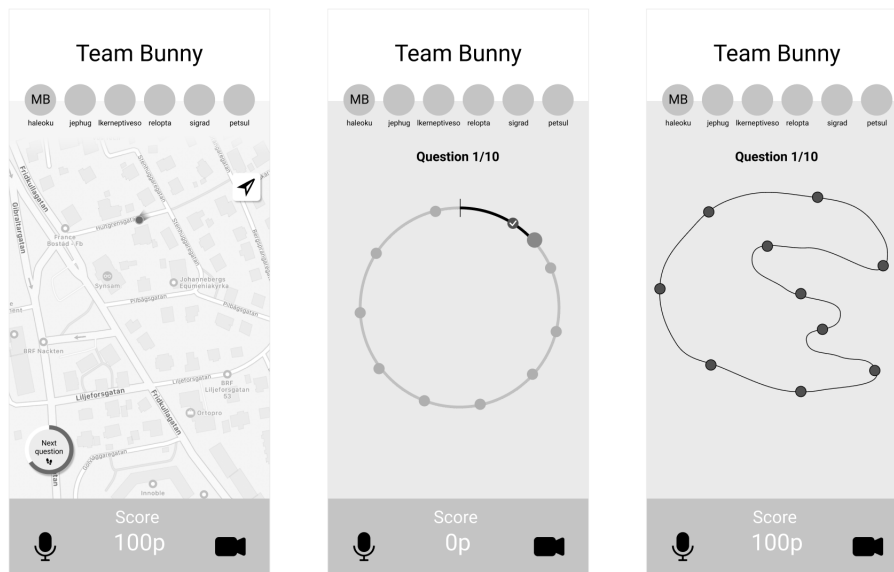


Figure 5.22: The three different maps shown to the participants in the evaluation.

The reason for asking the participants about the three different maps was to find out not only which one they liked, but also which one satisfied its purpose the most. A real life map has the most details, but this might be unnecessary information in this context. The two fictional maps show a stripped down representation, but the question was whether it was too abstract and hard to understand. The circular one might also be interpreted as a clock which is why the third alternative with an irregularly shaped route was included.

5.5.5.2 Results of third evaluation

The overall impression of the application was that it was a fun and intriguing idea and there was an interest of playing the game in reality. The evaluation also resulted in some input and insights that were brought to the next iteration. For example there was a wish to see whether the other members of your team were walking or if they were slacking off. Several participants also suggested the incorporation of a "ready" button before starting the game, so that everyone could say that they were ready and not just suddenly get thrown in the game. The gallery consisted of quite small squares representing each participant's video. However, because of their size they were interpreted to be placeholders for avatars rather than for videos.

The possibility to swipe was not obvious to the participants who stated that there need to be some sort of hint that this action is possible. One participant suggested that page indicators in the bottom of the screen could be used, while another participant had the idea of placing some sort of handle on the left or right side, which the user can grasp to pull out another page. The possibility to vote on the alternatives was raised by several participants, stating it could be fun and a nice feature if there are several opinions among the team members.

Regarding the maps shown to the participants it was clear that the map representing

the reality was not needed since you do not have to move to a specific location on the map to receive a question. Furthermore, the fictional map represented the progress of the game in a clearer way. When comparing the two variants of fictional map (the circular and the irregularly shaped) the response was that the circular one looks more like a watch and could be seen as representing time. On the other hand the map should not be too irregular since it becomes harder to see the progress and understand how far away the goal is and how much of the route is completed. It was also stated that the irregular one was too specific and detailed, looking like it represented a real route. This map was nonetheless the most liked and seen as more explorative and therefore the one that was brought into the final concept.

Showing that the role of the inputer is assigned to different team members at every question and that only one of them can do the input is an aspect that needs more improvement. It was not clear to all participants that they could not do the input nor that they were supposed to discuss the choices within the team. Some users understood that another player was supposed to do the input, but also thought that the player should do the choice on their own, that it was that player's turn to choose category or how much to bet. Thus, this aspect needs more clarification.

The test participants had no obvious preference when it came to betting points versus collecting clues as the main function of the game. However, due to the limited time left of the project a decision was made to move forward with the concept of betting points. This decision was based on the fact that this concept was more developed at this point and the goal was to develop something of good quality rather than quantity.

5.5.6 Final concept

The aim of this part of the process was to further develop the chosen concept into a high fidelity prototype. This was accomplished through the use of an inspiration board, and prototyping on a more detailed level.

5.5.6.1 Ideation

To ideate some more on the chosen concept a SCAMPER was made. The reason was to get some alternative ideas on how different functions and pages in the application might look and not get stuck on the already roughly made prototypes. Some of the ideas in the SCAMPER were a direct idea from participants in the previous evaluation, while some others were related to their statements and questions.

In order to visualize the feeling that the application should evoke, an inspiration board was created (see figure 5.23). This involved getting inspiration from other products, looking at pictures which capture the desired feeling, and investigating popular design styles. This was complemented with looking at different typography as well as expressing which emotions users should feel when using the application. Furthermore, a colour scheme was developed.

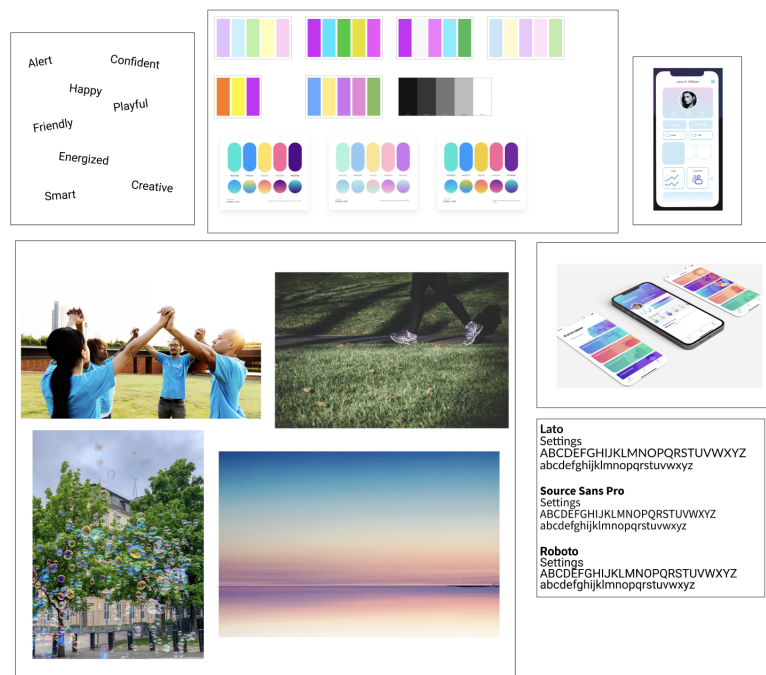


Figure 5.23: Inspiration board showing the desired feeling of the prototype.

5.5.6.2 Prototyping

The colour scheme, typography as well as icons was set in a style guide, then the development of a hi-fi prototype started. The prototype was created using Figma and involved creating fixed components for how e.g. the header and footer should look, making it consistent across all pages involving these elements. It was also determined how buttons should look in their normal state, when pressed and when disabled. When placing each element on the page a grid was used in order to make sure the same distance was kept from the edges of the page as well as between some of the elements themselves, making it more visually pleasing and less crowded. Additionally a theme for the background was chosen which was in line with the feelings from the inspiration board.

The prototype consisted of the whole intended flow of interaction - from the user opening the application for the first time to finishing the game. Further, it involved 10 questions (which is one of the modes to choose from), making it more realistic when testing it with users. Some of the backstage interactions were also emulated since it was not possible to create these for real. An example of this was a dot moving on the map showing that the team is walking. This was prototyped by setting a time for how long the dot should move. In reality it would be based on the distance walked by the users.

The pages of the prototype was connected to make it interactive. Although many of the intended interactions were prototyped, some were excluded due to it demanding too many different screens. For example the points received or lost on each question was only correct for the first question, and the visualization on the map (see Figure

6.14 in the result chapter) of whether a question had been answered correctly or not was not connected to the answer on the questions - their purpose was to show an example of how it would look.

The background theme was later changed to be more subtle, also connecting more to the goal of users being outdoors when playing the game. Instead of the sky-like blue, trees were added on a solid blue background together with a few discreet white clouds (see figure 5.24).

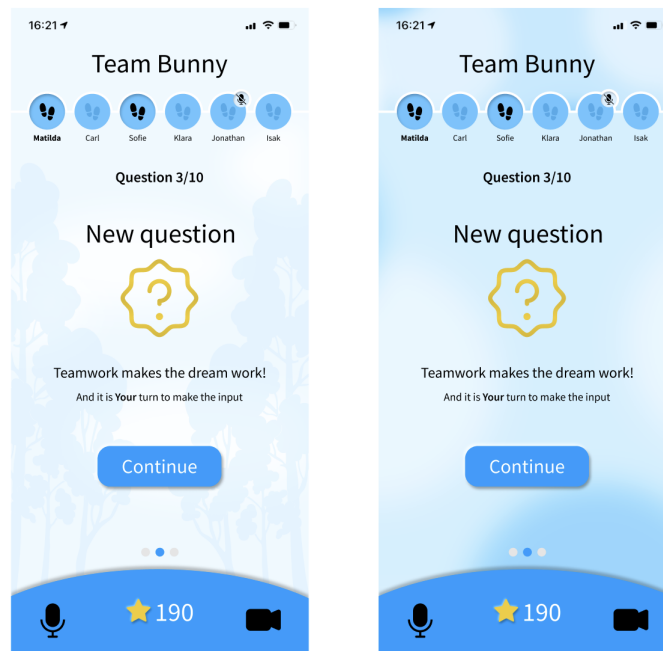


Figure 5.24: Two variants of background theme. The right background was later changed to the left.

5.5.6.3 Evaluation

To evaluate the prototype a Cognitive Walkthrough (CW) inspired user test was conducted. The reason for it being only inspired by the CW was that this application has a very linear flow, thus there are not many different tasks that can be given to the users to test. This evaluation was formative as the goal was to find out what in the design works well and what needs improving. Two different versions of the prototype were tested in a between-subject manner; one where the user should create the game session, and one in which they should join an already created session. The evaluation was performed via Zoom and all participants were recruited from the previously held interviews in which they had all approved being contacted when it was time for user tests. The participants were first presented with the purpose of the test (see Appendix K) and then asked to sign a consent form. This was done by sharing the screen showing the consent form and giving the control of the mouse pointer and keypad to the participant. Thus, they were able to fill it in themselves. The content of the consent form was the same as for that used in iteration 3. Following, a context for the application was read and a screen showing

the prototype was shared through Zoom. The participant was given the control of the test leader's computer mouse so that they could interact with the prototype themselves. A task was given to the participant depending on which variant they tested. If testing the session creation the task was to set up a session with 6 players, including the user, wanting to play the shortest variant of the game. They were then asked to play through the game. During the test the user was encouraged to think aloud, and was also able to ask questions and give comments on the prototype. The two test leaders acted as the user's team mates in order to give a more realistic feeling when interacting with the prototype. Afterwards the user was given a short questionnaire including questions regarding the prototype they had been interacting with (see Appendix L). The questionnaire was the same as the one used in the user test for iteration 3, but some additional questions regarding visual aspects had been added.

None of the participants for this user test had participated in any of the previously conducted user tests, thus they did not know what they were about to test as they had not been a part of the process since the interviews.

6

Results

In this chapter, the guidelines identified will be presented along with the final concept, which is an example of how the guidelines could be implemented.

6.1 Guidelines

Seven guidelines to follow when designing to encourage both remote socializing and physical activity were identified. These are all based on the personas which in turn are based on the user research performed in this project, and are presented below in Figure 6.1¹:

-  Include a team aspect
-  Motivate physical activity
-  Provide the opportunity to see progress
-  Be able to participate wherever you are
-  Encourage synchronous conversation
-  Allow for inclusiveness among users
-  Let everyone participate on equal terms

Figure 6.1: The seven identified guidelines for how to design to encourage remote socializing and physical activity.

¹Icon made by Freepik and Smashicons from www.flaticon.com

6.1.1 Include a team aspect

Cooperation is something that not only contributes to a stronger bond among team members but it also has a positive impact on our mental health, as mentioned in section 3.2. Several of the interviewees as well as participants of the questionnaires also mentioned that they like working together with others during an activity, and that competitions are more fun if you compete in teams. Thus, including a team aspect is identified to be of high importance so that users can cooperate synchronously.

6.1.2 Motivate physical activity

As mentioned in section 3.2, physical activity has a positive impact on our physical and mental health. The user research performed in this project also revealed that people want to be more physically active than they are at present as many people have a very sedentary work and working from home has taken away their daily walk or bike ride to and from the office. Therefore it is deemed important to, through the product or service, motivate and encourage the users to be physically active.

6.1.3 Provide the opportunity to see progress

Allowing the users to see their progress during the whole process is beneficial as it gives the user feedback on what they have accomplished and what is left to do. This is also something that was brought up during the interviews as being important.

6.1.4 Users should be able to participate wherever they are

This is one of the core aspects of the project, to connect people and allow them to maintain a good relationship with friends, family and colleagues wherever they are located. The user research showed that many people are currently socializing remotely through many different kinds of channels due to the pandemic restrictions. However, this is not something that is only desirable now, due to the pandemic, but also in the future as one might still be located in different cities. Several of the interviewees also mentioned how great it is that the acceptance of video calls and socializing remotely has increased as it allows them to have a better connection with friends and family living in other cities or even abroad.

6.1.5 Encourage synchronous conversation

The questionnaire and interviews showed that when meeting up with others people want to do something more than just talking. Furthermore, wishes to performing an activity whilst communicating through video was found by Kirk et al. (2010) (see section 3.1.3). Therefore an object for discussion should be provided. By including an activity the participants have something to talk about without there being someone who takes the initiative to get a conversation started. Teambuilding activities were appreciated by many respondents as it allows the participants to get to know each other better. Furthermore, the conversation should be synchronous since this contributes to a stronger feeling of cooperation as well as making the

discussion feel more meaningful, as mentioned in section 2.2. A conversation being synchronous also opens up for discussions about more than one topic of conversation.

6.1.6 Allow for inclusiveness among users

Every participant should be able to contribute and not feel left out. During the interviews it was mentioned that a very important aspect is that everyone should feel involved and have fun. By letting everyone contribute and work together the feeling of communion can increase.

6.1.7 Let everyone participate on equal terms

No participant should have to take on the role as moderator or creator, resulting in they themselves not being able to take part. This would go against the idea of creating a common social interaction, which is part of the overarching goal of the project. It was also stated during the interviews that an important aspect is that everyone should be able to participate.

6.2 Final concept

To investigate how the identified guidelines could be implemented a concept was created. This concept is thus based on the guidelines, and it is important to note that this is *one* suggestion of how to solve the problem with lack of social interaction and lack of physical activity. In this section, the final concept created in this project is presented in detail.

6.2.1 Style guide

In order to get a common vision of the visuals of the design, a style guide was made. After researching and looking at other, similar, applications and different colour schemes, blue was set as the primary colour. This colour was also selected based on the key words from the inspiration board. One of the goals was to keep the design clean and simple and therefore only one primary colour was selected, however, different saturation of the same hue was used. Green and pink was also selected to be used as there is such a well established convention about these colours representing right and wrong. Since red-green colourblindness is the most common one it is of high importance that the feedback does not rely on the colours alone, but has some complementing text or icons to emphasize the message.

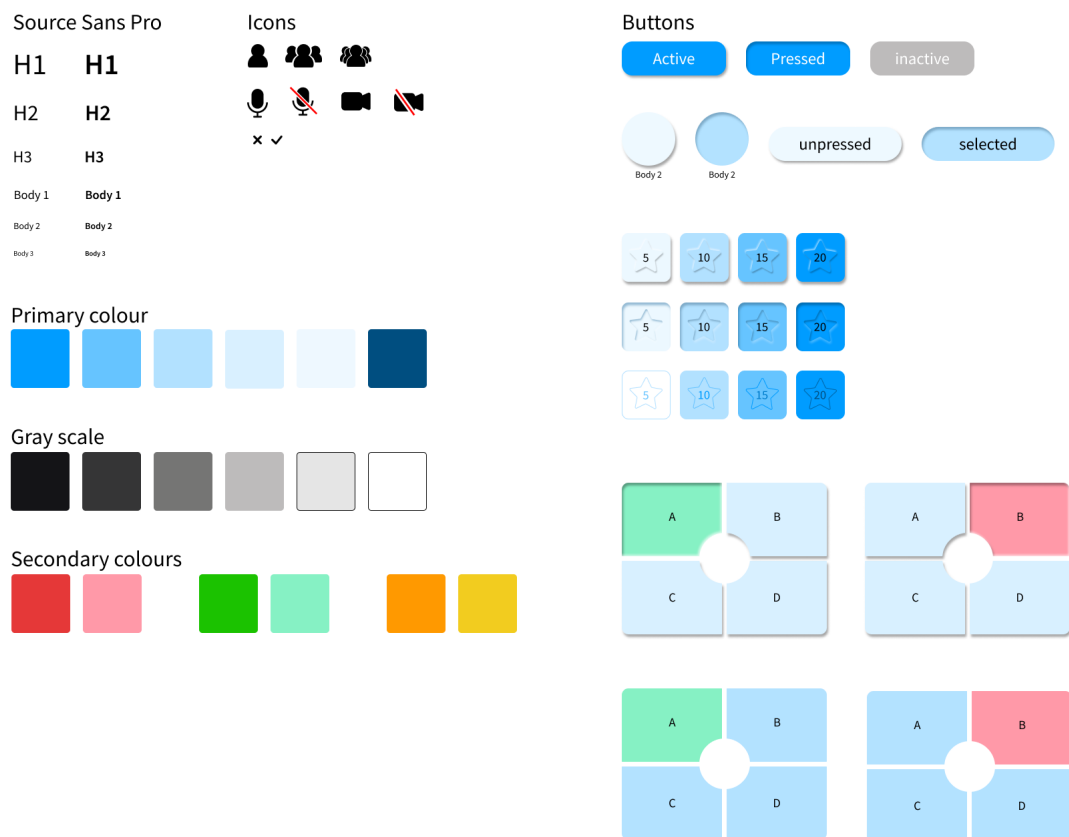


Figure 6.2: The styleguide created for the final concept.

As it is a mobile application that is being designed all buttons has to be big enough so that ones finger does not completely cover them when clicking. One feedback that came from the previous user test was that it was a bit unclear who is responsible for making the input. To make a clearer distinction between the two modes of making and not making input, different levels of affordance was used.

6.2.2 The prototype

The game was given the name "Actrivia" as this refers to the users being active while playing, as well as it being a trivia game. If a user is using Actrivia for the very first time, they are presented with four onboarding pages (see Figure 6.3). These frames contain a short descriptive text as well as an illustration to summarize the purpose and use of Actrivia. These frames also help emphasize the essentials of Actrivia, such as everyone helping out and contributing with their knowledge to answer questions and that it is the collective distance walked that triggers questions to appear. It is possible to skip these pages but the skip button is intentionally made smaller and placed in the top right corner in order to nudge the users to at least briefly look at the information. To get to the next page the user can either press the "next" button or swipe, as swiping is an interaction commonly used on touchscreens today, especially in relation to page indicators.

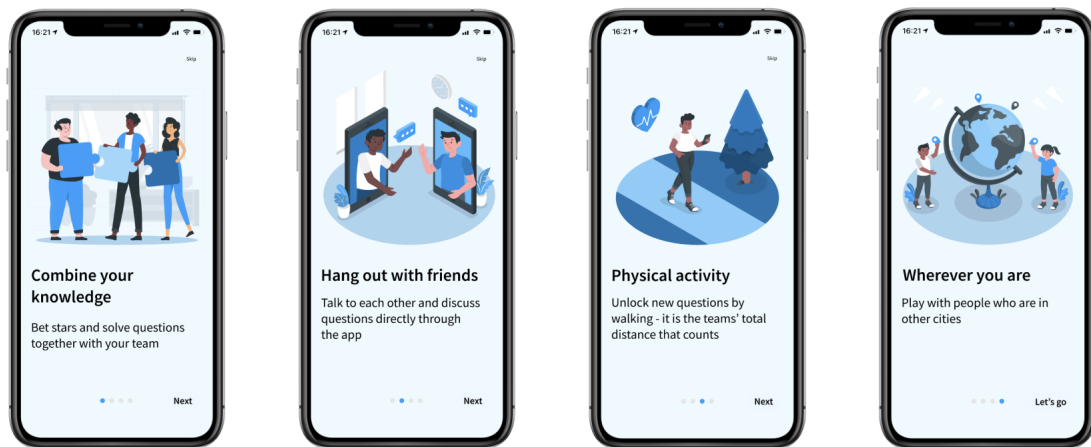


Figure 6.3: Onboarding pages.

Figure 6.4 shows the main page of the prototyped application Actrivia. From here it is possible to either create a new game or join a session that one of your friends has already created.

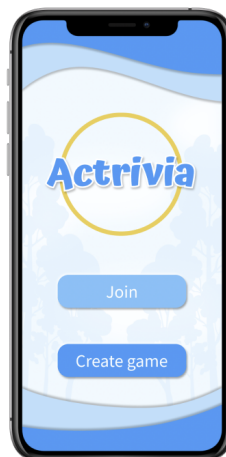


Figure 6.4: Main page.

When creating a new game session the user is presented with the view shown in Figure 6.5. This is where they set up the length of the game and how many people will be playing. All buttons that are related to selecting a mode are radio buttons, meaning that only one alternative can be selected at a time (Cooper et al., 2014). To make it clear for the user that they have to select both number of players and number of questions the buttons are grouped by shape and layout, also the continue button stays inactive until the required setting has been made. For the number of questions, 10, 15 and 20 are just arbitrary numbers and is not based on anything particular.

When one of the buttons is pressed the shadow changes to give it a pressed look, and the colour of the selected button becomes more saturated to make it more

distinguished and emphasize which mode has been selected. The button titles or icons gives the user a hint about only being able to select one of them, and by using radio buttons the prototype matches the mental model of only being able to select one but that you can change between the choices. What happens then is that the previously selected button returns back to the unselected stage and the new choice becomes more saturated and gets the pressed look. During this stage it is possible to go back to the previous page if the user changes their mind or accidentally clicked the wrong button on the previous page.

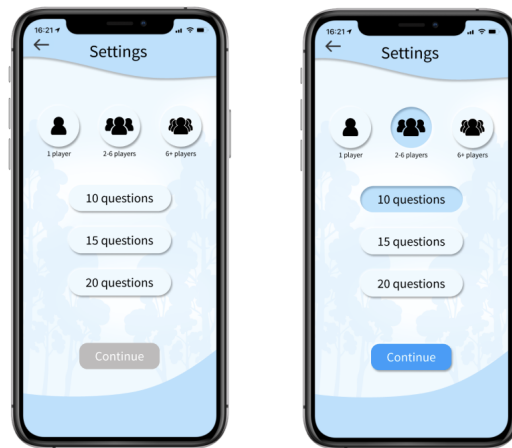


Figure 6.5: The settings available when creating a new game session.

If the user is creating a new game session a session code is automatically generated, as seen to the left in Figure 6.6. This code can then be shared to friends or colleagues directly through Actrivia by clicking on the invite button, which will activate a menu on the bottom of the screen where the user can select different ways and people to share the code to, such as SMS, messenger, email, etc. If you are one of the friends or colleagues who has been invited to a game session to play the user can either paste the code or enter it manually in order to get access to the correct session, as seen in the middle of Figure 6.6. When a valid code has been entered the "enter session" button is enabled.

When the session code has been properly shared or entered the users enter the session. This takes them to the picture shown to the right in Figure 6.6, where the users enter their name. It is mandatory to enter your first name, which is shown by the asterisk. The reason for making the decision of using first and last name and not nickname is because users might play with people that they barely know, for example if they are new at work and this is played as an after work activity. In those cases it is beneficial to see the first name of your teammates. It is still possible to type in a nickname or imaginary name but designing it this way at least nudges users into entering their given name. As soon as the user has started to enter their first name the join button is enabled.

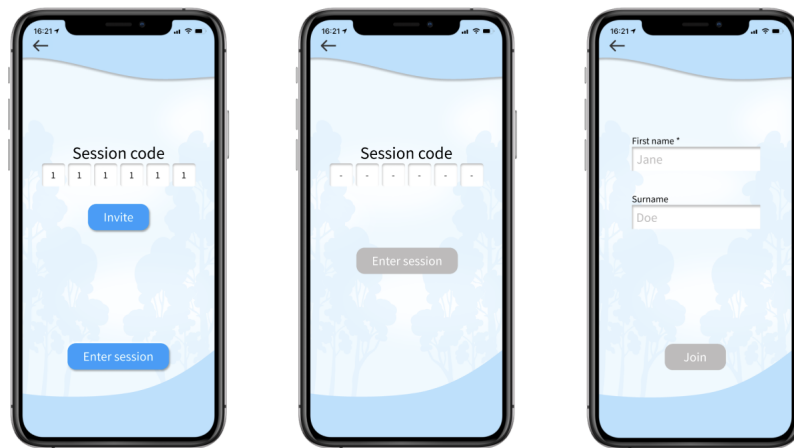


Figure 6.6: Entering a session.

When the user has clicked on the join button they have to allow access to the phone's microphone, camera and location service. After this they get to a "waiting room", shown in Figure 6.7, where all the players in a team gather before starting the actual game. In this room you can see your teammates through video and also hear and speak to them, assuming that their microphone and camera is turned on. The person who created the game session is responsible for starting the game when everyone has joined and is ready to start playing. When the start button is pressed, the game begins.



Figure 6.7: The waiting room in which the players end up when having joined the session.

When entering the game the players first see the screen shown to the left in Figure 6.8. The text "start walking" and the footprints are shown until the individual player starts walking. Thus, the other team mates could have already started walking, it is not until you start walking yourself that these elements will disappear. Based on the input from the previous user test, held in iteration 3, this kind of map was chosen - not completely circular, but not too irregular. The blue dot on the map represents the team moving, and advances along the map in a speed representing how fast the

team is moving. It shows how far to go until reaching the next question (shown as squares on the map). As the blue dot progresses a blue line is drawn behind it, showing how much of the route has already been walked, and thus the progress of the team. A checkered flag is also placed at the top to visualize where the goal is and to clarify the progress even further. The reason for using a checkered flag is that it is recognized by many people as it often is used for representing the finish line.



Figure 6.8: Maps in the beginning of the game.

When a player is walking the footprints on their circle in the header change from being faded to being filled (compare the left and right page in Figure 6.8). Additionally, their circle receives an inner shadow, making the circle look pressed (or stepped on). When the player stops, the inner shadow disappears and the footprint is once again faded. This feature was based on the input from the evaluation with users in iteration 3, where some users wished to be able to see whether the others in their team were walking or not. The number of starting points the team has is shown in the footer. The points are represented by stars as this might have less of a connection to gambling than actual points, or money, with gambling being a potential ethical issue. See section 7.5 for a more detailed discussion about this.

When the team has walked the required distance a question is automatically triggered. In this prototype this distance is not set as this needs to be tested, but the important aspect is that the collective distance in the team is the trigger of the question. In addition from the screen displaying that a new question can be answered there will also be notifications in the form of sound and vibration. In this way the players will not have to look on the screen at all times if they do not want to, which can also be good from a traffic safety viewpoint. The left page in Figure 6.9 shows the screen for the inputter and the right page shows how it looks for the rest of the team. The main difference is that the inputter sees a continue button which can be pressed in order to open the question. On both screens a text is displayed saying who's turn it is to make the input. The role of being the inputter is randomized between the players at every question, letting all players try on this role. The name of the inputter is also turned bold in the header as yet another indication. In order to

remind the players of discussing the choices and coming up with a common decision the text "Teamwork makes the dream work!" is also displayed. The page to the right further shows a small crossed out microphone in the top right of one of the circles in the header. This indicates that this player is muted.



Figure 6.9: Receiving a new question as inputer and non-inputer.

The pages for betting and answering questions are flat and use low affordance for all players who are not supposed to do any input on the screen (see Figure 6.10). This is done to indicate that the player can not click on any of the alternatives. The page shown to the left in the figure is the betting page. Here a category is randomized and the players then have to discuss how many stars they want to bet on the question. If their answer is correct they will receive the amount of stars that were betted, but if wrong the same amount is taken away from their score. The colours of the different betting alternatives are set on a saturation scale of the same colour in order to symbolise how much is betted. The rightmost (most stars betted) alternative have the highest saturation value and the leftmost (least stars betted) have the lowest saturation value. Above the category (and throughout the pages of the whole game) the number of questions being answered can be seen. This is a way of showing the team's progress towards the goal.

6. Results

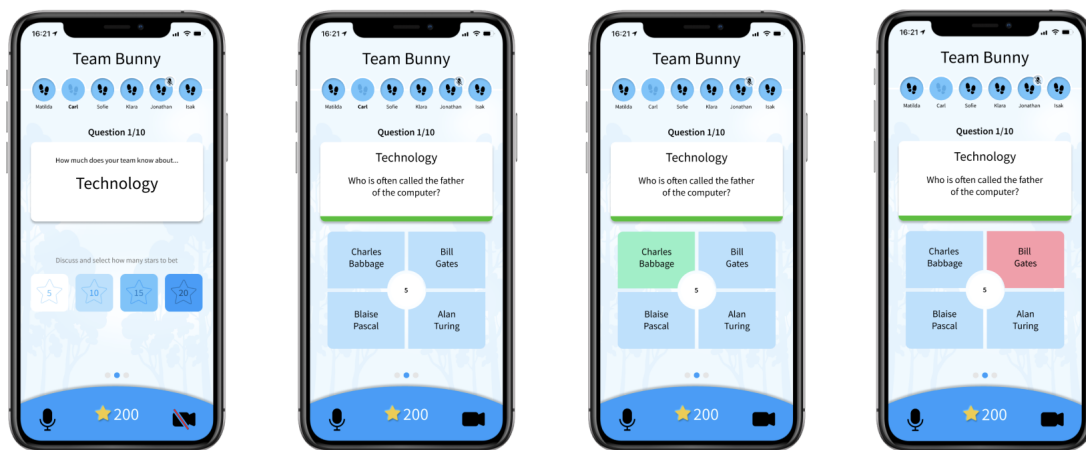


Figure 6.10: Betting and question when others are doing the input.

The three pages to the right in Figure 6.10 show the question given to the players. The green bar on the question card represents the time left on the question. As more time is passed the bar fades from right to left. The colour of the bar also changes with time - after some time the green is replaced by orange and when little time is left the bar is turned red. Thus, the colour of the bar in combination with the size of it indicates how much time is left to answer the question. The number of stars that were betted is also shown in the center of the alternatives, as a reminder of what choice the team made. When having answered the question the chosen alternative turns either green or pink showing whether the answer was correct or wrong, respectively. This is only shown for a short time and afterwards the next screen (see Figure 6.12) is shown.

Figure 6.11 shows how the betting page and question pages look for the player who's turn it is to make the input. The alternatives have higher affordance so as to show that they are clickable.

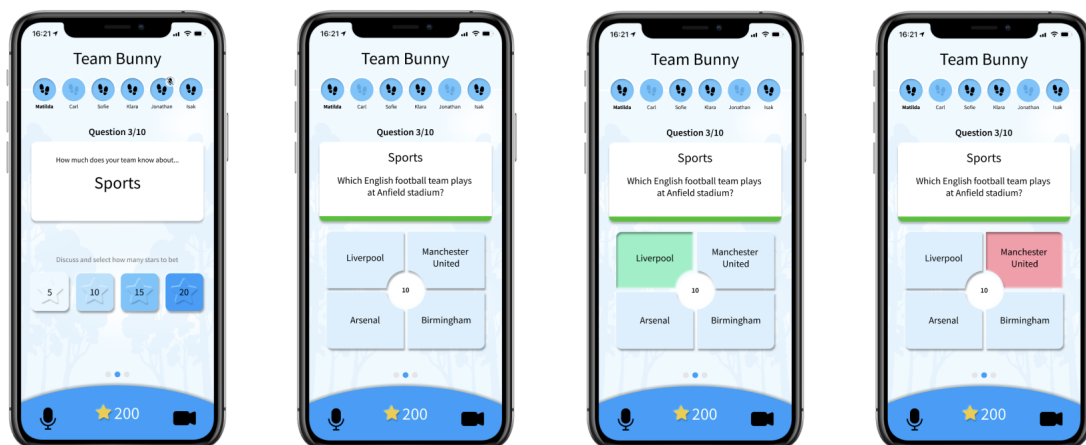


Figure 6.11: Betting and questions when you are doing the input.

When having answered correctly an overlay showing how many stars was won ap-

pears (see Figure 6.12). To show the connection between this star and the star for the team's total score in the footer, the colour of both stars is the same. If the answer instead was wrong the same star appears, but now it is grayed out and looks hollowed out in order to distinguish between correct and wrong, as well as to symbolize that stars have been "removed". Furthermore, the number of stars taken away from the pot is shown. These pages are shown for a certain time and are then automatically transitioned to the map view again.

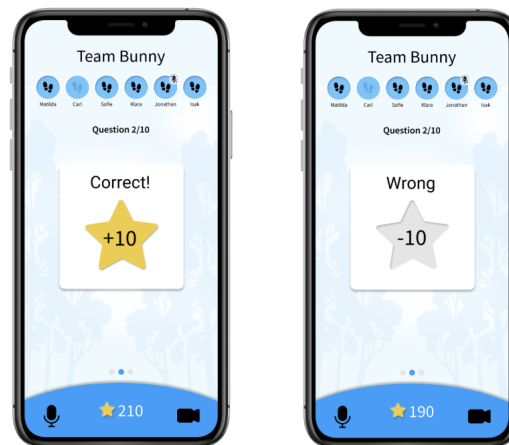


Figure 6.12: When answering correct or wrong.

On each page there are three page indicators right above the footer. These indicate that the player can swipe between different pages. What pages can be reached by swiping are shown in Figure 6.13. The page in the middle is the main page in which the game moves forward. Thus, what is shown here (the map, betting, questions, etc.) will always change. The left and the right pages on the other hand, are static throughout the whole game. They can be reached at all times, no matter where you are in the game. When swiping to the left page the player sees the gallery that was shown right before starting the game. The only difference here is that the score now is displayed in the footer and not the start button (for session creator) or a text (for joiners). Here the player can see the others' videos if they have their camera turned on. What can also be seen in this particular gallery view is that the player has now turned off both their camera and their microphone. This is indicated in two ways. First, the video is replaced by an avatar and a red microphone is shown in the bottom left corner of the square belonging to that player. Second, in the footer both the camera and the microphone are crossed out by a red diagonal line. The latter indication can also be seen from the other screens as it is displayed in the always visible footer. The page in the middle also shows an example of how it looks when someone is talking. Here, Sofie's circle is marked with a yellow outlining, which means that the sound from her microphone is being transmitted to the others. If swiping to the right side the player can see data about how far they themselves have walked and also the combined distance walked by the whole team. These numbers are updated as the players walk. Visually the design is affected by the number of participants in the session. The gallery view would look different as there are only

as many video feeds as there are participants, and the header would also include less circles when there are less participants in the session.



Figure 6.13: The three pages that can the player can swipe between.

When the team has almost reached the last question the route of the map is almost completely filled in with the same blue color as the dot showing the team's progress. When having answered a question the outcome of this is also shown on the map. A green square with a check mark means that the answer was correct, while a pink square with a cross means that the team had chosen the wrong answer. Thus, when reaching the end of the game the map would look something like that shown in Figure 6.14. This is an example of where a colour in combination with an icon contributes to the users' understanding of what is shown.



Figure 6.14: Map when almost all questions have been answered.

After having answered the last question the team is presented with their final score, as can be seen to the left in Figure 6.15. Here there is no longer only one player who can interact with the screen, but all players can move forward in their own pace.

The footsteps in the header are also turned into the initials of each team member since there is no longer a need to see who is walking or not. If only one letter is shown this means that this player has only entered their first name when joining the session. When clicking on "continue" the player is taken to a leaderboard, shown in the middle page of the figure. With the use of radio buttons the leaderboard can be filtered on scores from today, this week, this month, and all time. The list is also scrollable and the name of your team is written in bold letters in the list. If swiping to the right page from the leaderboard the player can see their individually walked distance throughout the whole game, as well as the teams total distance (see the rightmost page in Figure 6.15). From both the leaderboard page and the data page the player can click on "Leave" which means that they will leave the session and return to the main page of the game.



Figure 6.15: After the game has ended.

6.2.3 Evaluation of the final concept

Overall the feedback from the users when testing the prototype was very positive and some of them also asked about the release date of Actrivia and stated that they are always looking for new products to use with their team. Thus it was once again shown that there is an interest in this kind of product.

"I hope it is launched, then I will download it."
(Author's translation)

A big part of the design process has been put on how to show when someone else is supposed to do the input and when you are the one doing the input. The understanding of this was investigated in the evaluation and the result showed that it still needs some improvement. Some participants tried to click on the alternatives when it was not their turn, indicating that the allocation of the inputer and non-inputer role needs to be even more clearly visualized. One participant suggested that the inputer's screen could turn into another colour to show that it is their turn.

Regarding the colours of Actrivia some participants commented on the use of red

and green as indicators for correct and wrong as well as for the time ticking down on the questions. The comments regarded the fact that red-green colour blindness is the most common type of colour blindness and that some people thus might have problems with seeing the difference. However, as mentioned previously these colours are a quite established convention when displaying right and wrong, so using other colours, like yellow and pink for example, would probably not tell the players anything as neither of these colours are usually used to represent right or wrong. Therefore, to complement the red and green, other kinds of indications were included as well: the time bar getting smaller when on a question, and displaying in words whether the answer was correct or wrong.

Another aspect that was commented on during the evaluation was the way Actrivia registers that someone is walking. One participant suggested that the players might not have to walk, but move in some other way, like doing sit-ups or squats. In this way the players would still get some physical activity.

The gallery view before starting the game was also somewhat confusing. Some participants did not understand that this was a waiting room in which all players would enter before starting the game. However, this is something that would need more testing with an implemented prototype. In this prototype there were no real videos, just still images of different people, which might have made it harder for the participants to understand what the images were supposed to represent. Another factor making it harder to understand could be that in reality the people in this waiting room would have been able to talk to each other, possibly making it more naturally perceived as a lobby in which you wait for everyone who is expected to join. During the evaluation the test person was the only participant and although the test leaders acted as team mates it did not fully represent the real situation.

The possibility to swipe between different pages was something that few participants noticed. Although they were told that every interaction that is possible to do on a real mobile phone can be done in this prototype only one participant actually noticed the page indicators and tried to swipe.

In this prototype there is no possibility to see the correct answer if your answer was wrong. This was commented on by some participants when they had given the wrong answer, where they got curious about what was correct. One participant suggested that the correct answer to all the questions could be displayed after the game was finished so as not to evoke blaming each other for choosing the wrong answer during the game. Two other participants suggested that the correct answer could be displayed directly following the question, accompanied with a short text or story relating to the correct answer.

Additionally some comments regarding smaller details were stated by the participants. One suggestion was to remove the continue button on the final score page, and instead use an automated transition from this page to the leaderboard page. Another comment was to replace "join" with "create session" in the set up pages, for

the person creating the session.

7

Discussion

This chapter will be discussing aspects of the result, how the pandemic and use of different methods might have affected the result as well as further developments and ethical considerations regarding the thesis.

7.1 Result discussion

Several users stated that a voting function could be a nice feature to include when the team is choosing how much to bet and what to answer. This is something that have been discussed to a great extent during the design of the final concept, resulting in the conclusion to not include such a feature. The feeling of communion had to be weighed against the risk of one person taking over and doing the input themselves, not listening to the others in the team. Including a voting function would mean that everyone in the team always got a say as each player had to make an input. However, this would also mean that the players could answer the question without discussing it with each other at all. If everyone can enter their own guess there is no need for discussing, which might result in a game where each player contributes to the final answer, but without talking to one another. Since the main purpose of the application is to create a sense of communion it was therefore decided to not include the voting function.

In the data view the players can only see the team's total distance and their own distance. By having this solution no one in the team can be pointed out as not contributing to the group by walking slowly or a shorter distance than the others. The only thing a player can see is whether they themselves have walked longer, shorter, or the same as the average. The footprints in the header is also not showing how far or how fast someone is walking, only whether they are walking or not. However, there is one aspect that needs to be considered with this solution as well. Some users might feel uncomfortable with others seeing that they are not walking, making them feel pressured, especially if receiving comments from the other members in the team, even if the comments are encouraging. On the other hand users can encourage their team mates to be physically active by cheering each other on, when noticing that someone is not moving. Thus, the pros and cons for this aspect need to be weighted against each other, and more input from users might also be required. Furthermore, what triggers a new question is the collective distance, so even if someone is not walking as fast as the other members in the team, they still receive the question at the same time without some members having to wait for the others finishing their

distance. Thus, the individual distance does not matter, which makes the terms more equal.

During this project the importance of receiving input from users became even more evident. When creating the different concepts the betting was not considered to be a winning concept, leading to it almost being forgotten when preparing for the evaluation. However, during the evaluation with users it was found that all users considered it to be the best and most fun alternative.

One of the guidelines that was identified was to include a team aspect. It was concluded that more than six participants, which was set as the maximum number in one single session, requires more complex solutions as the group then has to be divided into several teams. This is something that initially was investigated, but was later discarded for this particular project due to its complexity and the existing time constraints. Still, being able to participate as a larger group than six is an important function as it allows for work teams to compete internally against only each other, contributing a lot to the user experience. Thus, how to implement it is something that should be explored further. The reason why six participants was set as the maximum number in the same session was that more participants than this could lead to some of them not being included, which was also stated by the interviewees. There needs to be an upper limit and this limit was set based on the average number mentioned in the interviews. However, it is not certain whether this number is the optimal one since it has not been tested. To investigate this further, more tests, with different number of participants and different kinds of personalities, are needed.

During the design process, the question of how the team members should be able to communicate was discussed. To support synchronous communication, the application should at least involve the possibility of communicating through audio. As mentioned in section 3.1.3, Kirk et al. (2010) states that the quality of the audio is what is most important to users and that video should not be included if this leads to a compromised audio quality. The application is intended to be used outdoors, where the quality of the reception can vary, which in turn affects the quality of audio and video. Outdoors usage can also increase the risk of latency, which can have a negative effect on the flow of the communication (see section 3.1.1). Additionally, the users are communicating whilst simultaneously performing another activity, thus, if video were to be used it is not certain the users will actually look at it. Nonetheless, audio as well as video was decided to be included as many benefits of using video has been found. Video allows for richer and a more varied feedback compared to audio only. Furthermore, it can induce a sense of bonding, making the users feel closer to each other (see section 3.1.3). The possibility of turning off the video is included in the final concept though, if the audio quality is affected too much or users just do not want to use the video. It should however be mentioned that the benefits of including video has not been tested since this would require implementation of code. Therefore, it is not certain whether the users would use, or appreciate, it or not, making this a point of investigation for further developments.

The initial idea presented by HiQ involved utilizing the location service of the users. However, at this point of development it was found that the location might not be needed, as the questions are triggered by distance and not coordinates. For further developments the questions might be based on the players' location in some way. This is not implemented in the current version but it has been discussed during the process. The conclusion was then that the complexity of it could be very high as there are a lot of places that need to be included and assigned a question, since the players could be located anywhere. Additionally, with the aspect in mind of there being an option where a bigger work team can compete only internally, all of these teams should preferably get the same questions. This could be difficult to solve if everyone are located at different places. Still, it could be an aspect to iterate on further.

7.2 Methods discussion

In this application the main part is for the players to interact socially by having discussions about what to bet and what answer to choose, as well as allowing conversation between these tasks. However, when testing the prototype only one participant took part at a time which meant that the multiplayer aspect was lost to some extent. Although the test leaders tried to act as the player's team mates it was still hard to fully simulate a video or voice call. This was due to the fact that the prototype required a moderator to partially control the interactions, and could therefore not be shared with several people at once. Additionally, the test leaders knew every function of the application and could not steer the test too much, making the roles as team mates a little bit constrained. Therefore it would have been interesting to test with multiple participants at the same time, using an additional tool, like Zoom, to connect the participants with each other and simulate the real situation where no one had any previous experience with the application.

Due to the fact that the interviewees were recruited through the questionnaire there is a possibility that this sample not adequately represents the target group. Not all personality types might voluntarily sign up for taking part in an interview, and those who do sign up probably has something to say about the subject in question and want to express their opinion. Thus, this is something to have in mind when investigating the needs of the target group. To counteract this possible bias, the many answers received in the questionnaire was used as a complement when constructing the personas, which in turn was used as a basis for the requirements specification, as well as for the identification of guidelines.

Most of the user tests were performed on distance, screen sharing the prototype on a computer. Although the prototype was shown as a mock-up on a mobile phone, the wrong device context could have contributed to the users not exploring the application thoroughly. Some kinds of interactions, like swiping left and right, might not have been thought of since this action is not possible to do on a computer, and clicking with a computer mouse is not the same as tapping on a touch screen. With this in mind it would have been interesting to do some more physical testing

to truly see whether or not the users understand what interactions are possible.

During this project time has been one of the biggest challenges. Since no problem space was stated in the beginning, a lot of time was spent on investigating if a problem existed and if so, to what extent. The result showed that this was truly a wicked problem since there is no specific procedure of how this could be solved. It was thus crucial to not rush through the discover and define phase, to make sure the problem was thoroughly investigated. This resulted in not having a lot of time for designing. If having had more time for the develop and deliver phases more aspects could have been tested. One would be to use the application in its intended environment, outdoors, in order to test how much attention it requires from the user. A second aspect is testing it with multiple users at the same time to better investigate how well the multiplayer works.

7.3 Pandemic consequences

Due to the pandemic some practical parts had to be done in a different way, which could potentially have impacted the project. First of all it was not possible to sit at the office of HiQ as everyone should work from home as much as possible. This meant having contact with the supervisor and other employees only through mail and online meetings, losing the availability of asking a short question face to face and getting an answer right away. Instead, on some occasions the project had moved on past the questioned point before an answer was received. Nonetheless, most of the time the responses were fast and effortless.

Another aspect that needed some rethinking was how to test the prototypes with users. The current situation led to having to perform most tests digitally, using a computer screen - a device differing in its interaction possibilities compared to the intended device of a mobile phone. However, the digital tests also opened up for testing with users in other cities, possibly making the sample somewhat more representative as different parts of the country was covered, and including both the countryside as well as the inner city.

7.4 Further developments

Where the questions come from is something that is still to be determined and the best way of setting up a database of questions has to be explored further. One idea that has been discussed throughout the project is how to include the users' location and whether or not it would be possible to base the questions on the users' current location. This however would require a lot more research on how to implement.

One thing that was brought up during the user test was the possibility to vote on how many stars to bet and/or vote on what you think is the correct answer. This function was not included in this prototype but we believe that it is a fun aspect and something that would require more testing in order to find out if it takes away

from the discussion or makes people feel more included.

Due to the shortage of time, the concept of collecting clues had to be set aside. This however is something that could be explored further as some of the users thought that it would also be a great way to encourage conversation.

Another thing that would be great to do is to make the prototype responsive. This would allow for user testing on different devices, such as the users' own phones. The current prototype is only designed for one phone model meaning that the interface is not adaptable to devices with other dimensions.

7.5 Ethical considerations

All data collected in this project will be saved until the project is finalized and approved. After this, the data will be discarded. Interviews have been recorded, either by sound or by video, if consented by the participant, whereas questionnaires were completely anonymous if not entering an email address to voluntarily take part in an interview.

There are also some ethical issues that need to be considered regarding the product itself. First of all, one of the fundamental parts of the product is to get people physically active by walking around outdoors. However, this could lead to potentially dangerous situations if users move around in traffic environments. This is something that has affected how the application was designed, as the users should not get so fixated to the screen that they miss everything that is going on around them.

If the location service of the phone would be used in any way it is important to keep in mind that people might be hesitant to give the application access to their location. Therefore it has to be very clear to the users why access to the location service is needed. A way of getting around this could be to use the step counter of the phones to count steps rather than collecting meters through the GPS-position.

The final concept involves betting stars as a way of guessing how much knowledge your team has on a certain topic. This could be somewhat sensitive as it can be associated with gambling. In order to make the connection less prominent the teams are betting stars instead of points or money.

A positive aspect that could come out of people using this product is an increase in physical activity, which would contribute to people's mental and physical health. However, when designing, one also has to keep in mind that all people work differently and thus can have different disabilities. This could for example be impaired eyesight, or physical disability - two factors that are of high importance considering the outdoors movement that this product infers.

Many companies, HiQ included, have offices in many different cities or countries, and therefore, having a product that allows employees to interact and keep up a good

relationship at a distance could potentially reduce the amount of traveling between the different offices. This would in turn have a positive effect on the environment. This does not only apply to office workers though, remote socializing might not live up to meeting in person but being able to keep up a good relationship with friends and family living far away might reduce the amount of traveling too.

8

Conclusion

The aim of this project has been to answer the following research question:

- *What should be considered when designing an application which solves both the problem with lack of social interaction and lack of physical activity?*

Seven guidelines were found regarding the research question. These are all based on the findings from the user studies and cover the most essential parts of what is important. The seven guidelines are listed in Figure 8.1:



Figure 8.1: The seven guidelines.

8.1 Final concept in relation to the guidelines

This section will conclude how the final concept created in this project corresponds to the identified guidelines.

8.1.1 Include a team aspect

The game is designed to be played in teams and working together to answer questions. However a single player mode has not been excluded in case one just want something to do during a walk.

8.1.2 Motivate physical activity

Questions are triggered when the team, collectively, has moved a certain number of meters, something that encourages physical activity. Knowing that the collective distance is what trigger questions to appear, thus being a team effort, might motivate users to move around as you do not want to let your team down. Other aspects that might motivate the physical activity is being able to see the progress and how close the team is to getting the next question, as well as the application showing who are physically active or not.

8.1.3 Provide the opportunity to see progress

Users can see their progress in several different ways, the most distinct one being able to see the team moving closer to the next question on the fictional map. On the map it is also possible to see the results from the previously answered questions. It also says, in writing, how many questions the team has answered and how many are left. It is also possible for user to see the distance they have walked, both their individual distance as well as the total distance of the team, something that is also a kind of progress.

8.1.4 Users should be able to participate wherever they are

Using distance instead of coordinates to trigger questions allow users to team up and play wherever they are located. Using a code that is specific for a game session also makes it possible to join from any location. One thing to keep in mind is of course that the game relies on a good internet connection, something that might not exist in every corner of the world.

8.1.5 Encourage synchronous conversation

In this kind of solution the participants are encouraged to talk to each other by discussing how much they should bet on the question, as well as which alternative to choose. This could also contribute to the team getting to know each other better, as they might discover each others' strengths and interests when discussing the question category. The questions and their answers can also be the subject of conversation when walking to the next question as the team might have thoughts about their answer being correct or wrong. By including camera and microphone in the application itself it is also easier for the participants to keep up the conversation without having to jump between different softwares. This further allows for the conversation to be synchronous.

8.1.6 Allow for inclusiveness among users

By restricting the number of participants that can take part in each game session the risk of someone feeling left out is, hopefully, reduced. As was stated by some of the interviewees, too many participants in a video or voice call will lead to some of the members being quiet and not part of the conversation. Another aspect making everyone contribute in this application is the fact that the role of "inputer" is randomized between the team members for every question. Thus, everyone has to be active at some point in the game since only one person can make the input.

8.1.7 Let everyone participate on equal terms

In this application no one has to create the questions, meaning that the person creating the game session is also able to participate in the game themselves. However, as for now it is not set exactly where the questions are coming from. Still, the idea of making it possible to create your own questions is not excluded from a future development of the application.

8.2 Concluding remarks

In conclusion both questionnaires and interviews showed that lack of social interaction and physical activity is a problem that currently exist. Many people miss their colleagues and the small common talks in the corridor, but it has also been found that they have started talking with friends and family, both in other cities and in the same city, in other ways. There has been a realization of video calls being a great alternative for meeting in real life, although not a substitution. It was also found that peoples' attitudes towards being physically active is that they would like to be more active than they are today.

Regarding whether the concept developed in this project is an alternative for help fixing these problems it can be concluded that it is. It was appreciated by most users during evaluations, both when testing the mid-fi prototypes and when testing the final concept. Several participants also stated that they would like to have this application and asked for its release date, proving that it is a wanted and needed concept.

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A

Appendix: Questionnaires

Socialt umgänge och fysisk aktivitet hos kontorsarbetare

Vi är två studenter på Chalmers Tekniska Högskola som utför vårt masterarbete tillsammans med HiQ. Syftet med den här enkäten är att ta reda på hur människor som arbetar på kontor upplever vardagen under pandemin, relaterat till socialt umgänge samt fysisk aktivitet. Svaren är helt anonyma och kommer endast att användas som underlag för detta arbete.

***Obligatorisk**

Del 1 av 3

1. Vad är din ålder? *

Markera endast en oval.

- ☐ 20-30
☐ 31-40
☐ 41-50
☐ 50+

2. Vad arbetar du med? *

3. Har du personalansvar? *

Markera endast en oval.

- ☐ Ja
☐ Nej
☐ Övrigt:

4. Om du har personalansvar, vad gör du för att upprätthålla en god sammanhållning mellan de anställda sedan pandemins start?

A. Appendix: Questionnaires

5. I snitt, hur ofta arbetar du hemifrån nu under pandemin? *

Markera endast en oval.

- ☐ Varje dag
☐ 3-4 dagar / vecka
☐ 1-2 dagar /vecka
☐ Aldrig
☐ Övrigt: _____

Del 2 av 3 - Arbetssituation och relationer

6. Om du arbetar hemifrån, vad saknar du med att arbeta på kontoret?

7. Om du arbetar hemifrån, är det något i vardagen, privat eller jobbrelaterat, som har underlättats sedan du började arbeta hemifrån?

8. Hur har du upplevt ditt sociala umgänge sedan pandemin började? (Detta inkluderar vänner, kollegor, släkt och familj, digitalt såväl som fysiskt) *

Markera endast en oval.

	1	2	3	4	5	6	7	
Jag umgås mycket mindre med andra	☐	☐	☐	☐	☐	☐	☐	Jag umgås mycket mer med andra

9. Om ditt sociala umgänge har förändrats, hur tycker du att det har påverkat ditt välmående?

10. På vilket sätt umgås du socialt med andra idag? T.ex via Zoom, på promenad, träffas i mindre grupper etc. *

11. Vilken/vilka after work-aktiviteter tycker du bäst om? (Generellt, även innan pandemin) *

12. Har ni haft någon digital after work på din arbetsplats? *

Markera endast en oval.

- ☐ Ja
☐ Nej

13. Om du svarade ja: vilken slags aktivitet var det?

Del 3 av 3 - Fysisk aktivitet

Fysisk aktivitet innebär all slags rörelse där energi förbrukas.

14. Vad tycker du om din genomsnittliga dagliga fysiska aktivitet sedan pandemin började? *

Markera endast en oval.

	1	2	3	4	5	6	7	
Jag vill gå mycket färre steg per dag	☐	☐	☐	☐	☐	☐	☐	Jag vill gå många fler steg per dag

A. Appendix: Questionnaires

15. I snitt, upplever du att du tar fler eller färre steg om dagen sedan pandemin började? *

Markera endast en oval.

	1	2	3	4	5	6	7	
Mycket färre	☐	☐	☐	☐	☐	☐	☐	Många fler

16. Vad tycker du om din genomsnittliga dagliga utomhusvistelse sedan pandemin började? *

Markera endast en oval.

	1	2	3	4	5	6	7	
Jag vill vistas mycket mindre utomhus	☐	☐	☐	☐	☐	☐	☐	Jag vill vistas mycket mer utomhus

17. Upplever du att du vistas utomhus mer eller mindre sedan pandemin började? *

Markera endast en oval.

	1	2	3	4	5	6	7	
Mycket mindre	☐	☐	☐	☐	☐	☐	☐	Mycket mer

18. Har du något du vill tillägga?

19. Vi skulle vara tacksamma om du vill ställa upp på en intervju (ca 30 min) för det här projektet. Är du intresserad av att delta, ange din mailadress här.

B

Appendix: Interview script

Tack för att du ställer upp!

Vi är M och K, vi gör vårt masterarbete på Chalmers åt företaget HiQ som har bett oss undersöka hur kontorsarbetare upplever den nuvarande situationen. Pandemin har haft en negativ effekt på människors välmående, både det fysiska och psykiska. Men pandemin har även bidragit till att digitala kommunikationsverktyg har fått mer plats och visat oss att det går att umgås på distans.

Som en påminnelse: Enkäten som du svarade på handlade om socialt umgänge och fysisk aktivitet hos kontorsarbetare, och syftet med den här intervjun är att få en ännu djupare förståelse för människors upplevelse kring dessa ämnen.

Är det okej att vi spelar in den här intervjun? Det kommer bara användas till det här arbetet för att vi lättare ska kunna gå tillbaka och höra vad som sades. Det är bara vi två (M och K) som har tillgång till denna inspelning. När vårt arbete är godkänt kommer vi radera inspelningen.

Namn:

Ålder:

Vad arbetar du med?

I vilken stad ligger ditt kontor?

I vilken stad bor du?

MIRO

“En typisk dag”

TILLBAKA

Vad brukade ni, innan pandemin, göra när ni fått en ny kollega för att de ska känna sig välkomna och ni ska lära känna varandra?

- Hur gör ni nu?
- Är det någon skillnad på hur det var innan?
- Är det något särskilt en behöver ha i åtanke nu?

Vad är din upplevelse av videokonferens-verktyg, t.ex. zoom eller microsoft teams?

- Vad fungerar bra?
- Vad fungerar dåligt?
- Är det någon funktion som du önskar skulle finnas med?

MIRO

“Du och några vänner ska umgås via ett videosamtal för att samtala och ha det trevligt. Vad upplever du är ett bra antal deltagare vid ett sådant tillfälle?”

- Varför har du delat in dem som du gjort?
- Hade du delat in på ett annat sätt om det hade varit endast ljud och inte någon video?

TILLBAKA

Gruppsamtal med eller utan kamera?

- Varför?
- Är det skillnad om man utför en annan aktivitet samtidigt? (T.ex. tar anteckningar i ett annat program eller är ute och promenerar).

Vad upplever du är de största skillnaderna på F2F konversationer vs video/röstkonversationer?

- Hur påverkas kommunikationen av dessa?

Bara en kan prata åt gången

- Hur upplevs det?
- Hur lätt/svårt är det att få ordet?

Vad krävs för att du ska umgås med någon/några digitalt (utanför jobbet)? Varför?

I vilka situationer hade du kunnat tänka dig att umgås med andra digitalt/remote även efter pandemin?

Har du några tips på hur man får alla att känna sig delaktiga/inkluderade när man umgås i grupp digitalt/remote?

Välmående

MIRO

Vad gör du helst på fritiden nu för tiden?

Vad får dig motiverad att hitta på saker? Ev. följdfråga om det skiljer sig nu under pandemin.

Vad ger dig energi?

Vad motiverar dig att röra på dig? Varför?

TILLBAKA

Har du “fått upp ögonen” för något nytt intresse/nytt sätt att umgås eller dyl.? Vad?

Många nämner att de känner sig mer omotiverade nu under pandemin, vad tror du att det kan bero på?

- Har du känt så?

Gör du något för att göra pandemin mer uthärdlig? Eller något som kompenserar för det du saknar?

- Vad?
- Hur bra har det fungerat?

Fysisk aktivitet

Om du går på promenad, brukar du göra något i samband med/samtidigt som du promenerar?

- Vad?
- Varför?

Brukar du använda någon app för fysisk aktivitet? (T.ex. för att uppmuntra till fysisk aktivitet, tracka fysisk aktivitet etc)

- Vilken/vilka?
- Varför?

Vad tänker du kring appar där målet är att användaren rör sig utan att tänka på det (att de inkluderar en distraktion från den fysiska aktiviteten)?

Tävling/lek

Vilken slags tävling/lek tycker du om? (fysiskt krävande / problemlösning / lag / samarbete)

Är det några aspekter/funktioner som du tycker är viktiga i tävlingar/lekar? (Exempel: hur tävlingen är uppbyggd) Varför?

Är det någon skillnad på dessa aspekter om man tävlar/lekar/umgås med nära bekanta/vänner vs relativt obekanta?

- Vad?
- Varför?

Vad tycker du om tävling/lekar digitalt?

Är det andra aspekter än de du nämnde tidigare som blir viktiga när tävlingen/leken sker digitalt?

Quiz är en populär aktivitet, vad tycker du om digitalt vs fysiskt quiz?

Avslutande del

Vad tycker du är viktigt för en eventuell app som både "löser" problemet med brist på socialt umgänge och ökat stillasittande?

- Vilka funktioner är viktiga?
- Vad är viktigt att tänka på?

Vilken slags aktivitet tror du hade varit rolig att göra för att uppmuntra till socialt umgänge på distans och även få deltagarna att röra på sig (ute).

- Vilka funktioner hade varit viktiga då? (T.ex. kunna se andras poäng, att det ska vara en lag tävling, etc.)

Hur ser du på framtiden kring digital kommunikation? Kan det komma något positivt ur den ökade användningen av detta?

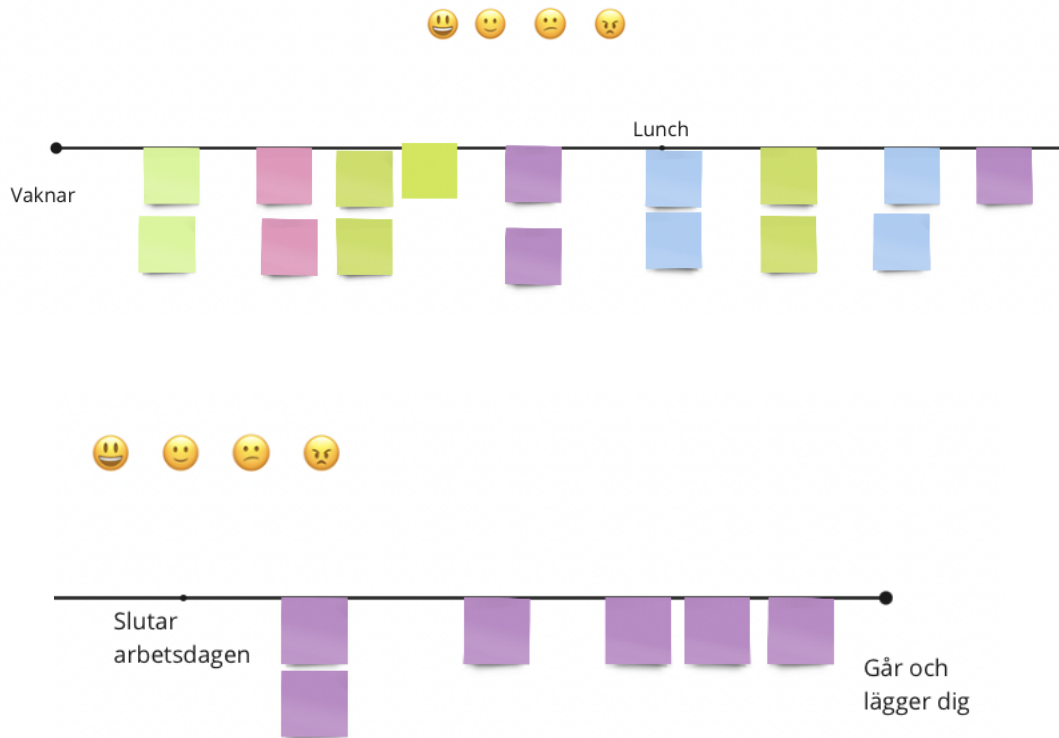
Tacka igen för att de ställde upp.

Senare i vår arbetsprocess har vi tänkt hålla i workshops och användartester. Är det något du skulle vilja delta i? I så fall kontaktar vi dig via mail igen, när det är dags.

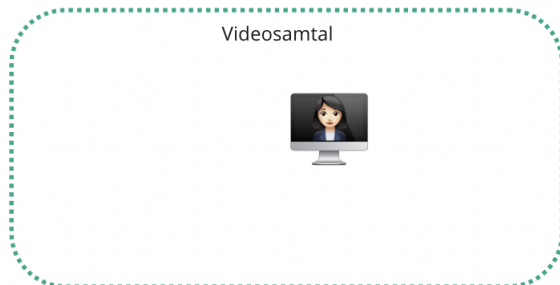
C

Appendix: Visualized interview questions

Question: "Can you describe a typical day?"



Question: "You and some of your friends are hanging out through a video call to socialize and have a nice time. How many participants do you think is an appropriate number for such an occasion?"



The four questions: "Nowadays, what do you prefer to do during your freetime?", "What motivates you to do things?", "What gives you energy?", and "What motivates you to get some physical activity?"



D

Appendix: Requirements specification

Specification of requirement	Measurement	Comment	N/D	Weighting				
				1	2	3	4	5
User requirements								
Easy to invite others to "play"	Possibly measure in keystrokes	Unclear for now how the process of "inviting" others will work	N					
Should be easy to "log in"	Should not have to create an account	To make it easier to start. Creating an account can be a hinder and "scare" people away	N					
Possible to schedule a session		A function that could make it easier to plan ahead and make sure people show up	D					
Be obvious what is expected from the "inputer"		The user should not need to ask themselves "what should I do now?"	N					
It should be quick and easy to set up a session	Possibly measure in time or keystrokes	To allow for spontaneous use	N					
Be obvious what is expected from a "non-inputer"		The user should know what to do without there being too many instructions	N					
Be obvious that decisions should be made together in the team		Users should understand that they take turns doing the input, but the questions should still be discussed together	N					
The gameplay should be on equal terms, session creator or not		Everyone should be able to participate	N					
Possible to temporarily leave the sessions without disturbing the gameplay		The rest of the team should be able to continue as usual	N					
Clearly show how a task should be performed		The user should know what to do without there being too many instructions - the users should easily learn what to do	N					
The purpose of the "game" has to be clear		Clear instructions of how the "game" works - that also are easy to find	N					
If input is needed it should be clear which participant is responsible for entering it		Clear instructions of who should do what, and a clear understanding that the participants have different roles (even if those roles does not differ to a great extent)	N					
Show summarized result of the activity when finished		Points	N					
Final result is displayed in relation to something else		Suggestably the result of other teams	N					
Possibility to stay and hang out afterwards			D					
Teamplay	2-6 players per team	Should be played in teams	N					
Sounds/noise in the background should not disturb the conversation		Allow quick mute	N					
Show the progress along the "game"		To show users what "milestones" they have already accomplished	N					
The tasks should be solved together		The participants should work together on the tasks	N					
Encourage conversation among the participants		Both during tasks as well as between tasks (to prevent "awkward silence")	N					

[illegible]

E

Appendix: Personas

Primary persona:

2. Ellinor Ståhl



Motivations

- Ellinor has a big social need
- Want to maintain a good relationship with all of her friends

Background

- Age: 45
- Account manager
- Divorced
- Lives in a townhouse in Malmö
- Ellinor's kids stay with her every other week

Frustrations

- People who get very cocky when they win something, aka "bad winners", can be frustrating.

Ellinor really likes to spend time with friends and family and does that very often since she has a big social need and she gets bored and unmotivated when she don't get to see them. She often meet up friends for walks to socialize. This is something that she also did a lot before the pandemic too since she likes being outdoors, but it has increased now due to the restrictions. If the weather is nice Ellinor feels obliged to go outside.

When Ellinor hangs out with friends or family, an activity they like to do is to play "party" board games, because those kind of games often makes you laugh resulting in a very fun and shared experience. One of Ellinor's close friends really likes to win though and Ellinor finds that "bad winners" can be a bit annoying since it can have a negative impact on the sense of community.

Ellinor finds it very important that everyone is having a good time and feel included, this is something she is good at, by making other's voices heard so that they don't feel left out.

Apart from caring a lot about others Ellinor also finds it important to take care of herself, making sure she is happy and healthy. By working remotely she gets a more flexible lifestyle and find more time to spend on herself. The more flexible lifestyle also helps a lot during the "kid-weeks" since she can spend more time with them and just get the everyday life come together more easily.

Ellinor has some friends living far away and being able to socialize remotely is a great way to keep a good relationship with them.

Ellinor's workplace often organize non-work related activities, something that Ellinor finds very fun and often participates in.

Secondary persona:



4. Lars Granqvist

Lars is quite competitive and likes to socialize with friends and family. Board games are fun because Lars loves competing with others and winning. He has also started to participate in online board games, which he finds very entertaining and fun, since it is another way of competing against others.

Lars does not really like working from home since it takes away his daily routines and he doesn't get as much change in the environment as he would like.

When it comes to hanging out and do things Lars is very good at taking the initiative and getting others to join. Lars has even helped arranging after works, where he used *aktiviteter360. Another activity that Lars likes is to go bowling with friends or colleagues.

Lars thinks that activities can be held remotely as the flexibility increases for people to take part when not everyone has to be in the same place. Even without an activity, socializing remote can be great as it allows Lars to keep up a good relationship with friends and family living in other places. However, one important thing when talking remotely is that the participants should have good equipment.

Motivations

- Winning

Background

- Age: 52
- Property developer
- Lives alone in an apartment in central Stockholm
- Has grown up children who has moved out
- Plays squash every thursday

Frustrations

- When the sound quality is bad during video/voice calls
- Sometimes things in the background can be disturbing in video/voice calls

Supplemental personas:



1. Elias Andersson

Before the pandemic Elias often worked out at the gym but now he don't feel like it is ethically OK to do that due to the restrictions. Since Elias prefers gym workouts when it comes to exercising he does not use any apps for physical activity today and has quite a sedentary lifestyle. However, Elias often get new ideas when using his brain and body, like when on a walk or such.

If an activity is gamified in some way, Elias finds that the activity can be more fun to do and gamification can also help with reaching goals since it can clearly show when you have achieved something.

Elias does not have a big social need and feels satisfied with hanging out with his partner and a close friend. However Elias is good at taking initiative to do things with his partner or friend.

Playing games online is something that Elias finds entertaining and when he socialize with others it's often remotely and sedentary.

Motivations

- When participating in a game or competition, Elias absolutely thinks that winning is fun, but it is important that everyone is having a good time and no one feels left out.

Background

- Age: 32
- Software developer
- Lives with partner in an apartment in Örebro
- Long experience in IT-industry

Frustrations

- Elias finds it frustrating when there is issues with the technology

3. Mari Zetterquist



Motivations

- Try new things

Background

- Age: 37
- Lives together with partner and 2 children
- Lives in a small village on the countryside, 70 km outside of Sundsvall

Frustrations

- If an app has a lot of bugs, I stop using it
- When technology troubles results in delays in meetings
- When people interrupt during video/voice calls

Mari likes to hang out with friends and family. Sometimes when they get together they play board games, often in the theme of solving some sort of mystery. To solve something together is one of the best parts of games, according to Mari. It is not so much about winning, but the fun is in the journey.

Mari has a lot of experience with video/voice calls and argues that requires a different culture than when meeting face to face. Her attitude towards camera usage is that she can use the camera during online meetings, but they doesn't feel like it is a must.

Remote activities is something that Mari encourages since it is more flexible and she doesn't have to travel in to town to participate. Working from home also gives Mari more time for exercising. Mari has previously used some apps for physical activity but now she lacks the motivation to keep using them. However, she usually takes part in physical challenges organized by some organization because then she has something to strive towards.

Mari has a lot of gaming experience and likes to play online games and talks to other gamers on Discord to organize the game. But when it comes to socializing with "non-gamers" she thinks that the distance alternative is a great complement but it does not replace meeting in person.

Mari likes to try new things because it is fun to gain new knowledge and experiences. She also tries to encourage other people to join them as they is good at taking initiative to hang out and do things together with others.



5. Arvid Ljungström

Arvid is very social and often hangs out with his friends and family. The best thing is to meet up with friends and do some activity together, like escape room or other activities where the focus is on the team solving a problem together. If choosing to socialize remote it should only be because there is no alternative to meet in person, but Arvid think it is good for maintaining a good relationship to people living far away. Remote activities can also be a flexible solution if Arvid and his friends happen to be in different cities.

Another activity that Arvid likes is to play board games. Board games are a great way to share experiences with others, and when playing with people he know the experience becomes even more fun. Although game nights sometimes lead to a competitive atmosphere, Arvid considers the most important thing to be that everyone should have fun, so that no one feels left out.

For getting some physical activity Arvid uses an app, and it is important for him to stay healthy and strong.

Arvid also likes quizzes because most often they have no limit of how many can participate.

Motivations

- Loves spending time with their dog, since it is a family member and a great companion
- Share experiences with others

Background

- Age: 29
- UX designer
- Lives in an apartment in Uppsala with a dog

Frustrations

- Video can sometimes be disturbing or distracting if another activity should be performed at the same time

F

Appendix: Context scenarios

F.1 Context scenario for Ellinor (primary persona)

1. Ellinor has been using a product to hang out with her friends and now she figures it could be a nice way of getting to know some of her colleagues better, so she invites them to hang out after work tomorrow.
2. On the decided day Ellinor goes outdoors and logs in to find that her colleagues have logged in as well, through their own devices. Ellinor is the moderator, so she is responsible for game setup.
3. Ellinor, as the moderator, starts the “game” and she sees a suggested route for her. All participants clearly notice that the “game” has started and so she starts to walk.
4. During the walk she converses with her colleagues and after a while she notices that she has reached a pit stop. They all stop and see the task, discuss an answer to it.
5. After having come to an agreement they decide to continue walking. Along one part of Ellinors’ path there is some traffic. She needs to zone out from the conversation with her colleagues and focus on navigating in the traffic in a safe way.
6. During the activity they can easily follow their progress.
7. At one point one of her kids calls her and she feels like she has to answer it. She tells the others to continue the activity and that she will catch up with them in a moment. Her kid can’t find his shoes, so she tells him that she has put them in the basement. He finds the shoes and Ellinor can return to the activity.
8. Finally they reach the last pit stop and enter their final answer. They then receive their result, which is also displayed in relation to something else.
9. Some of them decide to stay for a while to continue talking to each other. They then say goodbye.

F.2 Context scenario for Lars (secondary persona)

1. Lars' has been invited to an after work with his colleagues, a quite large group of people.
2. At the time that has been set for the after work to begin he logs in and gets sorted into a team with some of the colleagues.
3. The "game" is started and Lars is provided with a suggested route. The participants in Lars' team start to walk.
4. Lars talks to his team members as he walks, and after a while they notice that they have reached their first pit stop. They look at the task and discuss it. Lars makes sure that everyone in his team gets to speak their mind, and share their knowledge, before moving on. After coming to an agreement, continue walking.
5. At a later pit stop there is a lot of noise where Lars is. Lars therefore has a hard time hearing what the others are saying, and they can't hear him either. The others are also disturbed by the noise behind Lars, making it hard for anyone to have an understandable discussion. Understanding the others' frustrations, he decides to mute himself for a while.
6. At the final stop Lars and his teammates enter the final answer. They receive their result, which is also compared to the other teams.
7. Lars has to go to his squash practice, so he has not got the time to stay and hang out with some of the others, and so he leaves.

G

[illegible]

H

Appendix: Instructions for user test in iteration 3

In Swedish

Syftet med det här testet är att få input på två lo-fi prototyper som vi sedan ska vidareutveckla.

Du kommer att få interagera med två olika prototyper som visas på en mobilskärm. Efter varje test kommer du att få svara på en kort enkät.

Vi kommer inte testa dig, utan det är appen som testas.

Vi kommer spela in ljud, samt skärmen som du interagerar med.

Testet kommer ta ungefär 30 minuter.

Har du några frågor?

Kontext - koncept 1

Du har hört talas om en ny app som låter intressant, så du laddar ned den från appstore där den är beskriven så här:

“Umgås med dina vänner eller kollegor även när ni inte befinner er på samma plats. Gå på varsitt håll och samla ihop meter för att aktivera frågor som ni tillsammans kan svara på och samla poäng. Hur många poäng ni får beror på hur mycket ni vågat satsa - och såklart om ni svarat rätt! Genom ljud/video-samtal inkluderat i appen kan ni lätt diskutera svaret på frågan och låta samtalet flyta på även mellan frågorna. Har ni vad som krävs för att hamna på topplistan?”

Du och dina 5 kollegor bestämmer er för att prova appen och du får ansvaret för att sätta upp spelet. Ni vill inte köra en jättelång stund, så 10 frågor blir bra.

Kontext - koncept 2

Du har hört talas om en ny app som låter intressant, så du laddar ned den från appstore där den är beskriven så här:

“Umgås med dina vänner eller kollegor även när ni inte befinner er på samma plats.

Gå på varsitt håll och samla ihop meter för att aktivera frågor som ni tillsammans kan svara på och samla poäng. Ni kan även samla ihop ledtrådar på varje fråga som leder er närmare svaret på frågan vid resans slut. Genom ljud/video-samtal inkluderat i appen kan ni lätt diskutera svaret på frågan och låta samtalet flyta på även mellan frågorna. Har ni vad som krävs för att hamna på topplistan?”

Du blir inbjuden till att spela med dina 5 kollegor och får en kod som du har kopierat.

In English The purpose of this test is to get input on two lo-fi prototypes which we later will develop further.

You will be interacting with two different prototypes that are shown on a mobile screen. After each test you will be asked to answer a short survey.

We will not be testing you, it is the app that will be tested.

We will record the sound, as well as the screen you are interacting with.

The test will take approximately 30 minutes.

Do you have any questions?

Context - Concept 1

You have heard of a new app which sounds interesting, so you download it from app store where it is described like this:

“Hang out with your friends or colleagues even when you’re not located at the same place. Walk on separate locations and collect meters to activate questions that you can answer together and collect points. How many points you get depends on how much you dared to bet - and of course if your answer is correct! Through voice/video-call included in the app you can easily discuss the answer to the question and let the conversation continue between the questions as well. Have you got what it takes to enter the top list?”

You and 5 of your colleagues decide to try this app and you are responsible for setting up the game. You don’t want to play for a very long time, so 10 questions will be good.

Context - Concept 2

You have heard of a new app which sounds interesting, so you download it from app store where it is described like this:

“Hang out with your friends or colleagues even when you’re not located at the same

place. Walk on separate locations and collect meters to activate questions that you can answer together and collect points. You can also collect clues on each question which leads you closer to the answer to the question at the end of the journey. Through voice/video-call included in the app you can easily discuss the answer to the question and let the conversation continue between the questions as well. Have you got what it takes to enter the top list?”

You are invited to play with 5 of your colleagues and receive a code which you have copied.

I

Appendix: Consent form

Samtyckesformulär

- Jag har blivit informerad om upplägget av användartestet och förstår att jag under testets gång kan välja att avbryta.
- Min information kommer att skyddas och enbart användas i detta projekt.
- Jag har fått möjlighet att ställa de frågor jag har till testledarna.
- Jag godkänner att testet spelas in.

Signatur

Datum

J

Appendix: Questionnaire used during user test in iteration 3

User test questions

Detta är några frågor som behandlar din upplevelse av prototypen som du just interagerade med.

1. Vad är ditt helhetsintryck av appen (inte visuellt)?

2. Det var tydligt vilka "actions" som var möjliga att göra.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

3. Mina handlingar ledde till det jag förväntade mig.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

J. Appendix: Questionnaire used during user test in iteration 3

4. Hur lätt eller svårt var det att förstå vad nästa steg var?

Markera endast en oval.

	1	2	3	4	5	6	7	
Mycket svårt	☐	☐	☐	☐	☐	☐	☐	Mycket enkelt

5. Hur lätt eller svårt var det att navigera?

Markera endast en oval.

	1	2	3	4	5	6	7	
Mycket svårt	☐	☐	☐	☐	☐	☐	☐	Mycket lätt

6. Jag förstod när det var jag som skulle göra input.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

7. Jag förstod när det var andra som skulle göra input.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

8. Hur mycket underlättades interaktionen av texten som fanns med?

Markera endast en oval.

	1	2	3	4	5	6	7	
Texten gjorde interaktionen mycket svårare	☐	☐	☐	☐	☐	☐	☐	Texten gjorde interaktionen mycket lättare

9. Hur uppmärksamhetskrävande tycker du att interaktionen med appen var?

Markera endast en oval.

	1	2	3	4	5	6	7	
Den krävde mycket uppmärksamhet	☐	☐	☐	☐	☐	☐	☐	Den krävde lite uppmärksamhet

10. Tror du att det kommer att bli lättare att använda appen nästa gång?

Markera endast en oval.

☐ Ja
☐ Nej

K

Appendix: Instructions for user test of final concept

Syfte

Syftet med det här testet är att testa vår prototyp med användare för att få feedback på användarupplevelsen och usability.

Du kommer att få 3 tasks att utföra när du interagerar med prototypen som kommer visas på en mobilskärm på datorn. Efter testet kommer du att få svara på en kort enkät.

Vi kommer inte testa dig, utan det är appen som testas.

Vi kommer spela in testet via zoom.

Testet kommer ta ungefär 45 minuter.

Har du några frågor?

Kontext

Du har hört talas om en ny app som låter intressant, så du laddar ned den från appstore där den är beskriven så här:

“Umgås med dina vänner eller kollegor även när ni inte befinner er på samma plats. Gå på varsitt håll och samla ihop meter för att aktivera frågor som ni tillsammans kan svara på och samla poäng. Hur många poäng ni får beror på hur mycket ni vågat satsa - och såklart om ni svarat rätt! Genom ljud/video-samtal inkluderat i appen kan ni lätt diskutera svaret på frågan och låta samtalet flyta på även mellan frågorna. Har ni vad som krävs för att hamna på topplistan?”

Vi vill uppmuntra dig till att tänka högt medans du interagerar med prototypen.

L

Appendix: Questionnaire used during user test of final concept

User test questions

1. Vad är ditt helhetsintryck av appen?

2. Det var tydligt vilka "actions" som var möjliga att göra.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

3. Mina handlingar ledde till det jag förväntade mig.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

4. Hur lätt eller svårt var det att förstå vad nästa steg var?

Markera endast en oval.

	1	2	3	4	5	6	7	
Mycket svårt	☐	☐	☐	☐	☐	☐	☐	Mycket enkelt

5. Hur lätt eller svårt var det att navigera?

Markera endast en oval.

	1	2	3	4	5	6	7	
Mycket svårt	☐	☐	☐	☐	☐	☐	☐	Mycket lätt

L. Appendix: Questionnaire used during user test of final concept

6. Jag förstod när det var jag som skulle göra input.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

7. Jag förstod när det var andra som skulle göra input.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

8. Hur mycket underlättades interaktionen av texten som fanns med?

Markera endast en oval.

	1	2	3	4	5	6	7	
Texten gjorde interaktionen mycket svårare	☐	☐	☐	☐	☐	☐	☐	Texten gjorde interaktionen mycket lättare

9. Storleken på texten var lagom.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte alls med	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

10. Hur uppmärksamhetskrävande tycker du att interaktionen med appen var?

Markera endast en oval.

	1	2	3	4	5	6	7	
Den krävde mycket uppmärksamhet	☐	☐	☐	☐	☐	☐	☐	Den krävde lite uppmärksamhet

11. Det var en lämplig användning av färger i appen.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

12. Konceptet i den här appen uppmuntrar till samtal och diskussion.

Markera endast en oval.

	1	2	3	4	5	6	7	
Håller inte med alls	☐	☐	☐	☐	☐	☐	☐	Håller med fullständigt

13. Tror du att det kommer att bli lättare att använda appen nästa gång?

Markera endast en oval.

- ☐ Ja
☐ Nej