Rethink

THE RETHINK EXPERIENCE

Retake M1.1 Project
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inclusive design
thoughtful technology

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Preface

Welcome to the preface chapter, a chapter we have added to this retake report based on suggestions from our assessors to clearly reflect on the given feedback and give a response to this feedback that hopefully clears the air and shows why we took specific steps and did certain things. With our feedback, we felt a need to address them directly rather than in certain parts of the text so that an easy overview can be kept. Nevertheless, individual chapters are changed as well based on the given feedback and new information can also be found there.

Our previous report has changed on a few accounts into this new version, but mainly the final design chapter has been fully rewritten. Figure 1 clearly indicates all of the chapters with changes and where to find them. If only specific sections were changed, this can also be found in the overview. Below you can find a summary of the new information in the report distributed amongst the rubric criteria as well as our understanding of the feedback given and our response/argumentation for it. We hope this will make our story clearer and easy to assess which is why we added this preface to the report.

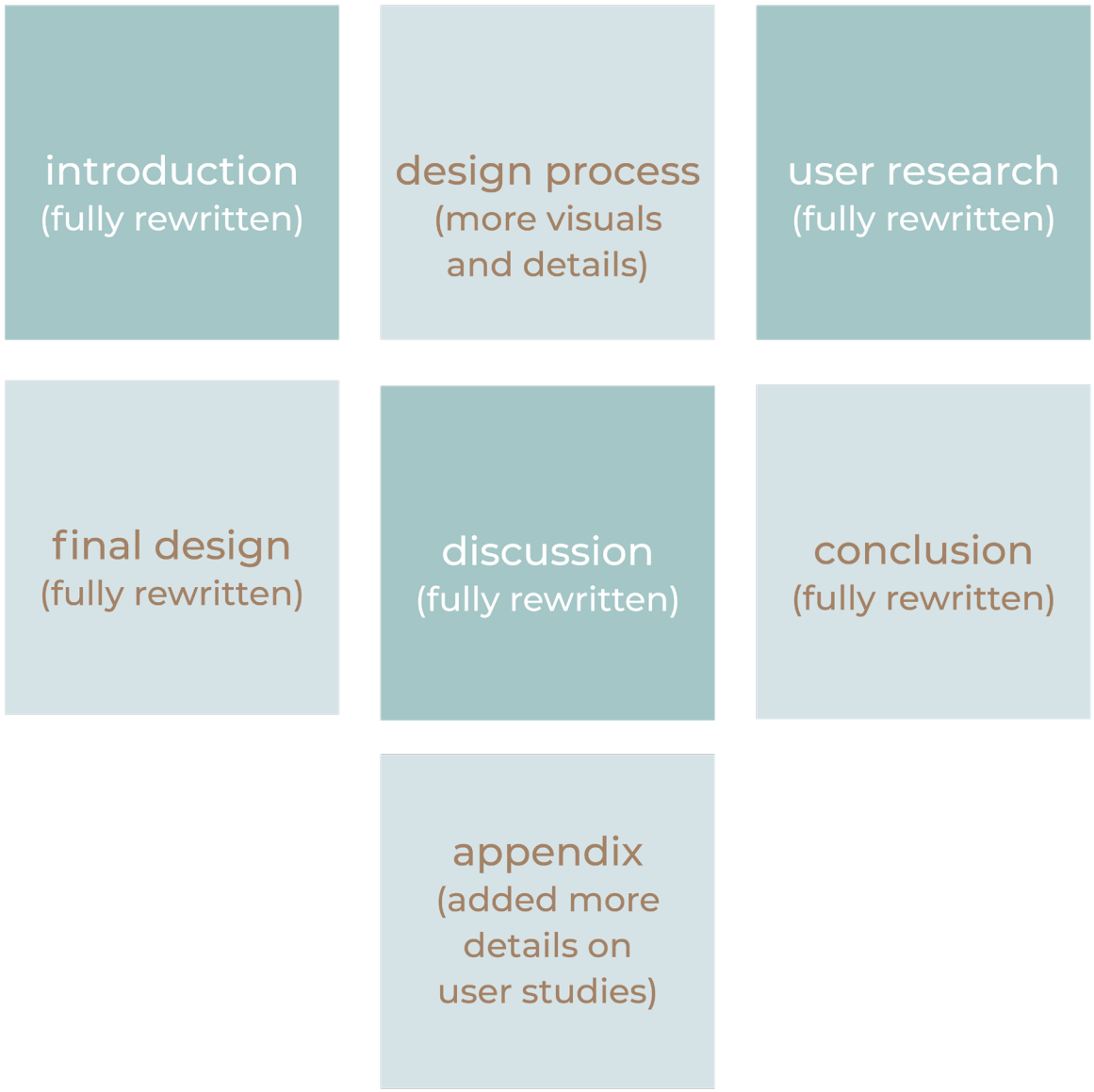

Figure 1 - Changes made in the report

Preface

Integration Of Expertise Areas

Based on the rubric assessment, it was understood that some discrepancies in understanding the expertise area integrations into the project. A spider diagram was made to show the distribution and extends for the integration (Figure 2). To explain this diagram in detail, a table (Figure 3) was made demonstrating specific activities executed for five expertise areas, with highlighting design and research activities for every iteration. Figure 3 also specifies which chapters in this report are for presenting certain activities. Lastly, Figure 6 (Page 9) clarifies the overall linked design process with Expertise Areas annotated for every step.

From Figures 3-5, it could be seen that Creativity & Aesthetics was present throughout the design process. Every iteration included such activities, ranging from conceptual sketches to low-fi prototyping, from graphical designs and branding to material finishing. These explorations, along with user research, were useful and integrated with design decision-making.

In addition, Business & Entrepreneurship was addressed in a few ways over the entire design process. In the first four iterations, benchmarking was done to understand competitors in the market and identify opportunities for the project. With a total of 173 benchmarks studied, they guided the design process for understanding market propositions of both digital well-being and experience design. The elaborated thematic analysis can be found in Appendix B. Figure 6 also showed a few other integrations in the design process that are typical for business propositions, especially since Iteration 3, with activities including branding, user journey map, personas, value proposition, defining the problem-solution fit, and performing the tech-ethics footprint impact analysis.

Lastly, Maths, Data & Computing were considered throughout the process. Quantitative data analytics of all 5 user studies were performed, and word maps and line/bar graphs were produced. To integrate this Expertise Area further, the potential developments of the system and data transformation behind the Rethink Experience and the Rethink Aftercare is elaborated, see Figure 7. For example, a personalised NFC token or an application tracking the results of the Rethink Experience for every time usage and giving data analytics, could be designed. These new additions, together with other improvements addressed in Discussion, could realise the experience better and offer additional value to the customers/ end users.

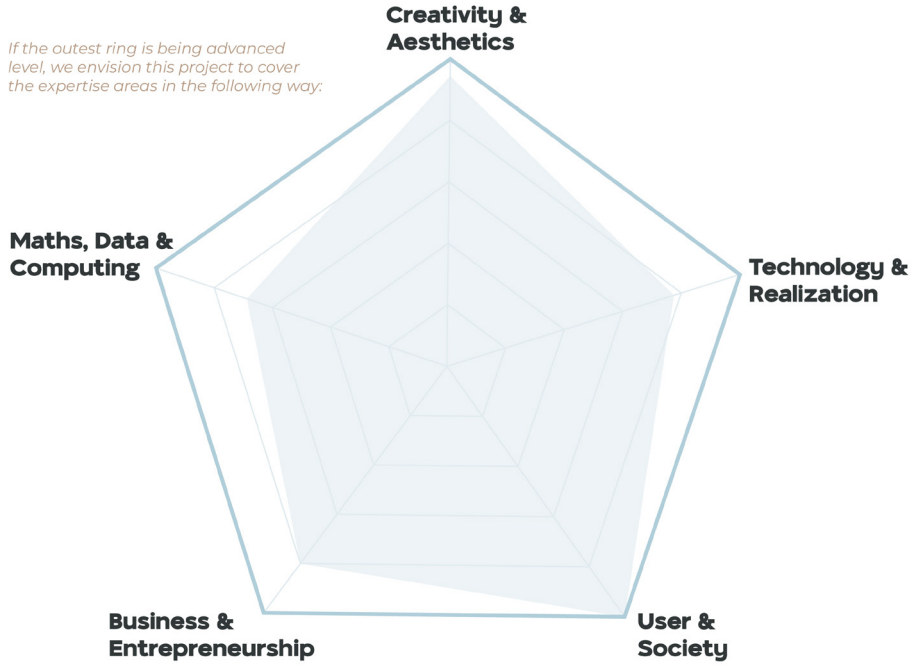

Figure 2 - Integration of expertise areas

Preface

	Iteration 1	Iteration 2	Iteration 3	Iteration 4	Demoday Design	Final Design
Creativity & Aesthetics	· Topic & target group ideation · Crazy 8 ideation · Conceptual sketch ***Everything is included in Chapter Design Process.***	· Crazy 8 ideation & tangible explorations · Conceptualisation with 7 sketches · Final concept sketch · Sensorial experience ideation ***Everything is included in Chapter Design Process.***	· Ideation for a reflective, experience design (***Design Process***) · Branding (***Final Design***)	· User co-creation sessions (***User Research***) · Concept ideation & sketches · Form & layout ideation & sketches · Conceptual laser-cut model · Connectivity ideation · Ideation for physical representation of emotions · Ideation of electronic/mechanical feasibility · Laser-cut scaled model · Group-level interaction ideation · Material explorations with tactile & sound sensations ***Everything is included in Chapter Design Process, except the annotated one.***	· Ideation of the final features · Prototype laser-cut · Prototype finishing (soldering, fabric finishing, resin filling, colouring, sanding, glueing, assembling) · 1st iteration Aftercare design · Ideation & preparation for user research 5 - usability & user experience testing (***User Research***) ***Everything is included in Chapter Design Process, except the annotated one.***	· Iterated Experience Design to Story · Iterated user journey map based on the Rethink Experience · New user journey map based on the Experience Design to Story · 2 personas · Storyboard · Who, Where, and What? visual · Iterated Aftercare system ***Everything included in Chapter Final Design.***
Technology & Realization			· Midterm demo day design (***Design Process***)	· Ideation of electronic/mechanical feasibility · Ideation on data collection methods in the design · Conceptual laser-cut model · Laser-cut scaled model ***Everything is included in Chapter Design Process.***	· Prototype laser-cut · Prototype electronics research & testing (buttons, LEDs, accelerometer, gyroscope, Arduino-arduino communication) · Prototype electronics circuit building & testing · Prototype finishing (soldering, fabric finishing, resin filling, colouring, sanding, glueing, assembling) · Arduino coding ***Everything is included in Chapter Design Process, and the ideal scenario is described in Chapter Final Design.***	· Iterated Rethink Aftercare design (***Final Design***) · Ideal functional scenario (***Final Design***) · Potential technological improvements (***Discussion***)
User & Society	· Target group ideation (***Design Process***) · Problem statement ideation (***Introduction & Design Process***) · Literature research (***Related Work***)	· User study 1 - survey (***User Research***) · Literature research (***Related Work***)	· Literature research - define a typical experience design process (***Related Work***) · Rescope context (***Design Process***) · Identify target group (***Design Process***) · User study 2 - user test for midterm demo day design (***User Research***)	· User study 3 - diary studies (***User Research***) · User study 4 - user co-creation sessions (***User Research***) · Ideation on group-level experiences (***Design Process***)	· Define and check the final features based on user study 3 & 4 (***Design Process***) · User/customer journey map (1st iteration) (***Design Process***) · Experience design to story (1st iteration) (***Design Process***) · User study 5 - usability & user experience testing (***User Research***) · Aftercare design (1st iteration) (***Design Process***)	· Updated Experience Design to Story · Updated user journey map based on the Rethink Experience · New user journey map based on the Experience Design to Story · 2 personas · Storyboard · Who, Where, and What? visual · Iterated Aftercare system · Data ethics & tech-ethics assessment (***Ethical Considerations***) ***Everything is included in Chapter Final Design, except the annotated one.***
Business & Entrepreneurship	· Benchmarking (***Benchmark***)	· Benchmarking (***Benchmark***)	· Benchmarking (***Benchmark***) · Branding (***Final Design***)		· User/customer journey map (1st iteration) · Experience design to story (1st iteration · Aftercare design (1st iteration) ***Everything is included in Chapter Design Process.***	· Iterated Experience Design to Story · Iterated user journey map based on the Rethink Experience · New user journey map based on the Experience Design to Story · 2 personas · Iterated Aftercare system · Value proposition canvas · Problem-solution fit · Tech-ethics assessment Data ethics & tech-ethics assessment (***Ethical Considerations***) ***Everything is included in Chapter Final Design, except the annotated one.***
Math, Data & Computing		· User study 1 - survey analysis (***User Research***)	· User study 2 - analysis of user test for midterm demo day design (***User Research***)	· Ideation on data collection methods (sensors, data communication) (***Design Process***) · Data analysis for user study 3 - diary studies (***User Research***) · Data analysis for user study 4 - user co-creation sessions (***User Research***)	· Prototype electronics research · Prototype sensor testings · Prototype sensor-actuator communication · Data analysis for user research 5 - usability & user experience testing of the Rethink Experience (***User Research***) ***Everything is included in Chapter Design Process, except the annotated one.***	

Figure 3 - Expertise areas integration & where to find the design/research activities in the report

Preface

Design And Research Processes

First, as addressed in the Discussion section, the project brief received was broad, giving a lot of potential for the project. Therefore, we saw an urgency in narrowing down the scope and finding a concrete problem statement for designing. It resulted in the first few iterations with many activities such as literature, benchmark, and user research. However, this doesn't mean that design explorations were not performed alone. Instead, we see a strong interweaving between design and research, as presented in Figure 6: identifying the gaps presented in research and translating them into the design.

The time spread for every iteration was not equally distributed, Figure 6 presents the spread of the weeks on the different iterations. We want to clarify that in Quartile 1, which is the first 10 weeks, this project was counted as the same amount of effort as a course, with one timeslot, and for 5 ECTS; while in Quartile 2, the 7 weeks, this project was counted as the effort for 10 ECTS, with two time slots. Therefore, midterm demoday was only 1/3 point of the project, instead of halfway. Figure 6 also includes the indications of the time span for every iteration in the corresponding quartile. The time span also corresponded with the sizes of certain activities.

In addition, the design approaches used for this project were detailed for the improved Introduction, as both user-centred design and data-enabled design. First, a user-centred design approach was used (The Interaction Design Foundation, n.d.). The survey, co-creation sessions, diary studies, and secondary literature research were used for understanding the context use and specifying user requirements, while the 2 usability testing of the prototypes helped with evaluating against requirements. In addition, a data-enabled design (Figure 9.1) (Bogers & van Kollenburg, 2019) was incorporated. In the everyday life loop (the contextual step), user, literature, and benchmark research were performed. In the design loop (the informed step), exploratory activities such as sketching, low-fi modelling, material explorations, and form-giving were incorporated.

The Rethink prototype as described at the end of the Design Process chapter, together with a printed version of Aftercare was tested in a similar setting as an exhibition context, on the final demo day. In total, 16 participants who were studying Industrial Design interacted and mapped their digital space, as the quantitative data collection. 4 participants provided written feedback with a digital survey, whereas the rest provided verbal feedback, which built up the qualitative data for this user research. The quantitative and qualitative data were analysed, and conclusions were drawn. This usability testing was better described and extended in the last section of the User Studies Chapter. This led to minor improvements in the final design accordingly.

It is worthwhile to explain the limitations of the overall user research. Except for the first user study (survey), all the rest involved participants studied Industrial Design at Eindhoven University of Technology, with convenience sampling executed. This was due to the project being granted 5 months and the limitations in accessing resources, which challenged us to look for participants from other universities or HBO's in this timeframe. Therefore, we see this as a limitation, which could be accounted for in future work (see Discussion).

Preface

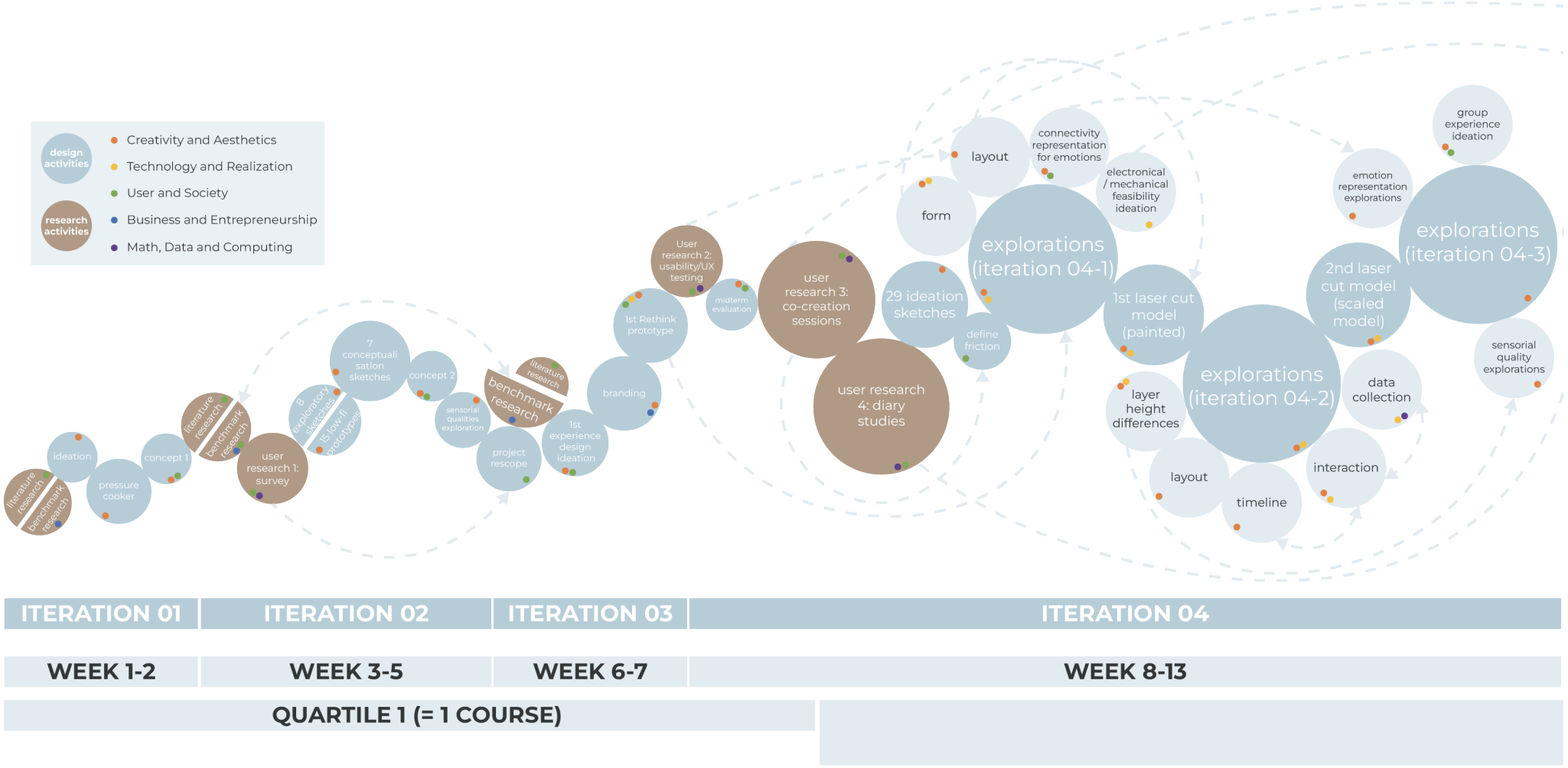

Figure 4 - Overview and relations among different activities in the design research process & expertise area integration part 1

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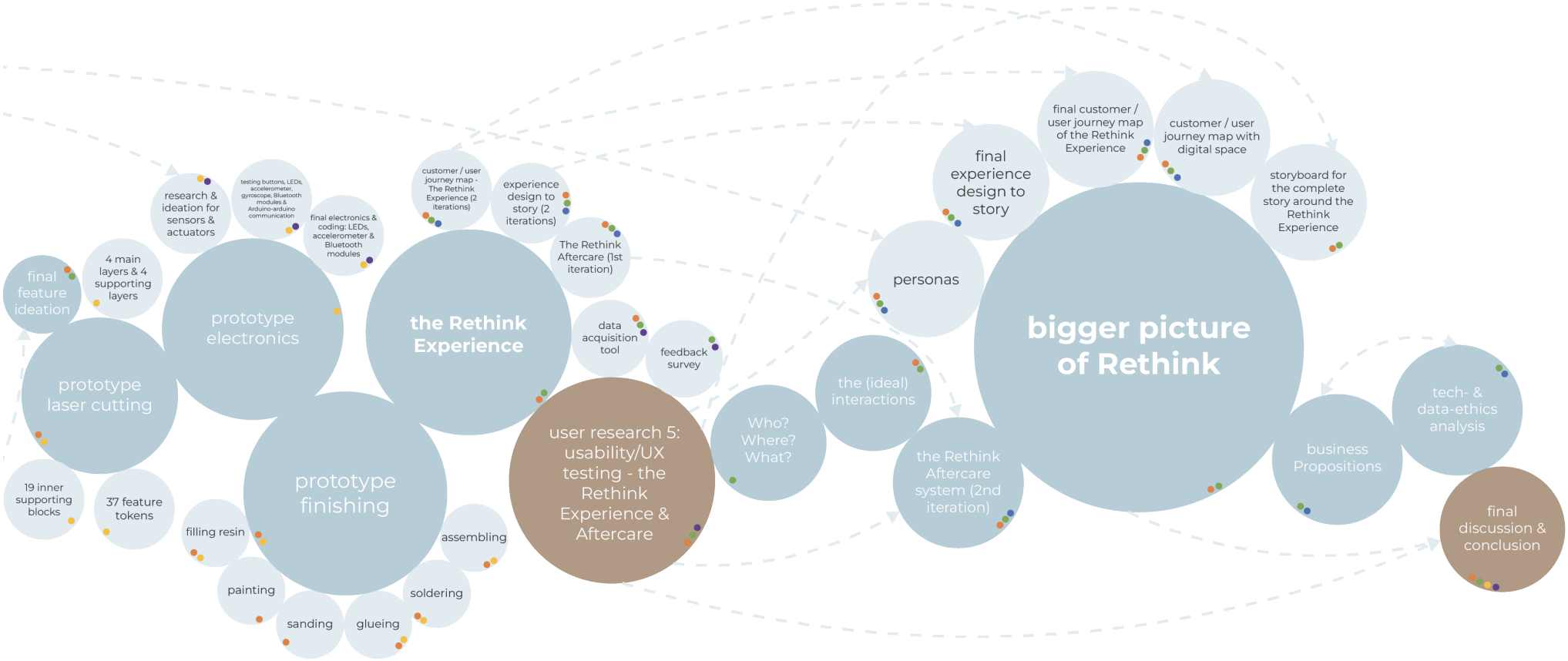

Figure 5 - Overview and relations among different activities in the design research process & expertise area integration part 2

Preface

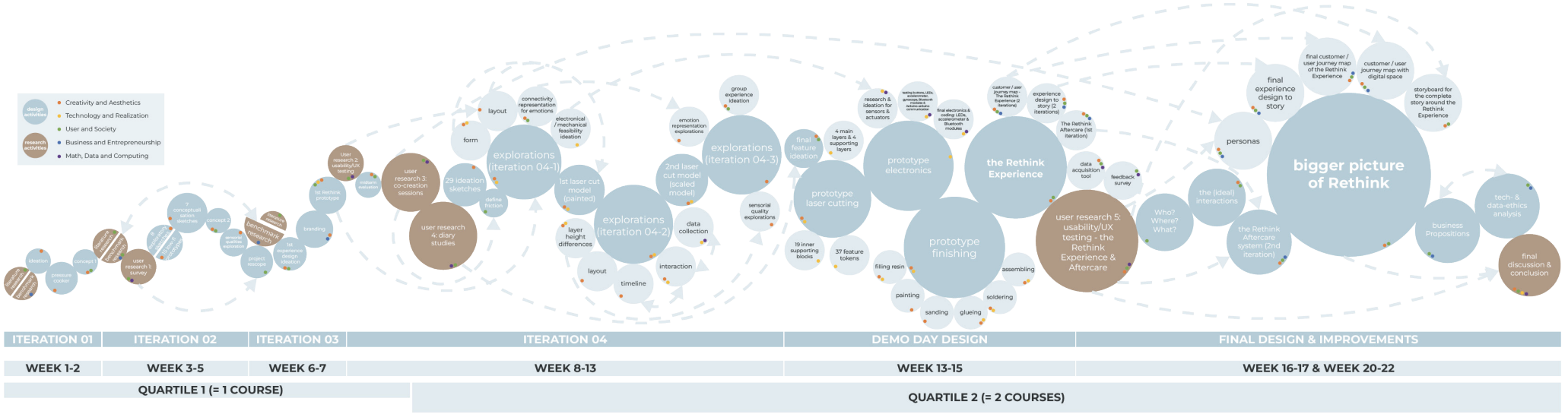

Figure 6 - Overview and relations among different activities in the design research process & expertise area integration overall

Preface

Figure 7 - The future of Rethink Experience & Aftercare - data processing

Preface

Figure 8 - Aftercare presented on demoday

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Figure 9 - Iteration on aftercare after demoday

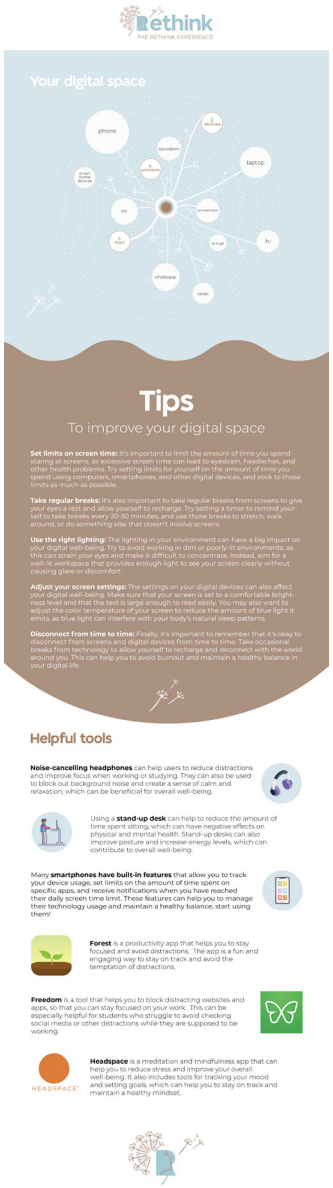


Figure 10 - Aftercare

Preface

Figure 11 - Demoday demonstrator

Preface

Demonstrator

The rubric section feedback on our demoday demonstrator showed there was a need for further clarification. On the demoday our demonstrator was shown and presented which included; the prototype, the storyboard, the user journey and the aftercare system (figure 11). Unfortunately during the preparations for the demoday prototype, the Bluetooth module broke which meant the full prototype, as we intended it to be, was not able to work. We are still unsure what happened and assessed what could have caused it like broken soldering, pins soldered were perhaps too close together and becoming connected resulting in a short circuit, and no sufficient power supply, but ultimately this was out of our control the day before demoday. The prototype itself was not fully operational, which is why we pivoted the prototype and let it instead simulate a user's interaction and experience through a pre-programmed loop that would turn certain features on and off every 30 seconds. This program was created based on user studies, mainly the diary study, and shows the general on/off features during the day. On top of this, we initially were also including actual buttons but needed a total of 38 buttons for this. That in itself was not a big problem, however each button would have needed its own digital pin on the Arduino and because 1 Arduino only has 14 digital pins, we would need around 4 to 5 Arduinos to realise the buttons and all the LED lights. We could not find a better solution for the buttons, by trying more than 3 different types of buttons and setups, and ended up deciding to leave out the buttons which would make our demonstrator even more prone to breaking or not working at all.

To give you a bit more details on the prototype itself, we aim to explain why it might be understood that our demonstrator was not fully working as we received some comments about this as well. The outer ring, the timeline, was programmed to measure the position of the 00:00 time and based on that send digital signals to the inner layer based on which time position it recorded. The inner layers, the features, would then respond by turning on or off, based on diary studies analysis. Unfortunately, the Bluetooth modules that facilitated this signal exchange broke or did not work as they should. We resolved this issue by using a Wizard of Oz approach to simulate a real experience with the user without the full interaction. We did this by printing out a scale model of the demonstrator on a piece of paper that we marked according to the users' actions. They could fully interact and touch the buttons on the prototype but instead of things immediately lighting up (showing it is turned on) we wrote them down. This ended up working very well and helped us gather data from sixteen participants during the demoday.

During the demoday, we also included our user journey and experience to design story; informing people how the full experience of Rethink would look like beyond the physical interaction with the demonstrator and how Rethink could look in people's lives. Besides that, we included the aftercare system both on cardboard and digitally which helped simulate the designed experience. The goal of all of these 'add-ons' was to show what would happen pre- and post-experience, aiming to clarify the benefits of Rethink in a way that is attractive to users. Feedback was also gathered on this and used to create the final iteration of the aftercare system but as mentioned previously, the first version of this system (figure 8) was presented at the demoday.

Preface

Scientific And Professional Skills
Feedback concerning the scientific and professional skills section on the rubric was mostly about the discussion and conclusion. We see how that might have needed more clarification than we initially presented and we agree that we should have done that. Because of that, almost all chapters have been changed, mainly the introduction, final design and discussion. We held ourselves very strictly to the word limit of 5000 words in total and therefore did not feel we had the space to elongate these sections, However, we have rectified this and elaborated more on the discussed points as well as added in some new ones.

To conclude and summarise these aforementioned findings, this section will highlight the most important things to note. Rethink does not aim for behaviour change but a deeper level of awareness through critical reflection, we however do support post-experience with an aftercare system which solves a need expressed by participants in our user studies. Rethink is an experience design rather than a product or service in itself which is what students were ready for, the next step would be to use this deeper level of awareness and turn it into an intervention but that is outside our scope.

The final validation that has been done to validate our concept and our demoday design can be found in the user studies chapter and its results are incorporated in the final design chapter. The final user testing included 16 participants and tested the concept of Rethink including the aftercare system. The final design chapter also highlights again our target group, the setting (the environment where Rethink is designed to exist in) and the value it brings to the target group. We hope this chapter gives more clarification on the questions and other points of feedback we received and further information can be found in the separate chapters.

Table of Contents

1. Introduction

Problem Statement

Digital technologies are pervasive; they transform our ability to connect, affect our understanding of the world and ourselves, and can change our behaviours in ways we do not even recognize (Hoehe & Florence Thibaut, 2020). It is essential to consider the impact of these technologies on well-being and productivity, as students spend a significant amount of time on their phones; 8-10 hours per day (Roberts et al., 2014). This can result in challenges for students in managing and processing the vast amounts of information delivered to their devices daily (Cecchinato & Cox, 2017). Industrial design students, in particular, have a vast digital space engaging with multimedia throughout their day for education, work, and leisure. Research shows digital technologies are influencing the way design projects and practical studio work are taught (Loy et al., 2015). While the advantages of these new technologies are clear, constant use may also yield negative consequences, such as a loss of productivity due to interruptions in work life (Duke & Montag, 2017). Studies have also found that excessive use of digital devices has been linked to negative impacts on mental health, such as increased stress and anxiety (Pantic et al., 2019) (Limone & Toto, 2021) (Pantic, 2014).

Project Goal

This project aims to raise a deeper level of awareness and encourage a healthier relationship with digital technologies for Industrial Design students. We seek to create a critical reflection moment on the negative consequences of excessive technology use, such as decreased productivity and increased stress (Duke & Montag, 2017), while also highlighting the many benefits of digital technologies, including improved communication and access to information (Mohammadi, 2020). The goal is to increase the Industrial Design students' awareness of their relationships with digital technologies throughout the day and to potentially help them to improve their digital well-being. Eventually, resulting in a reflective attitude towards technology and thus a healthier relationship with smartphones and other digital devices.

Rethink

Enabling critical reflection for digital wellbeing

Figure 1.1 - Demoday poster

1. Introduction

The Project Process & Approach

Approach

A combination of data-enabled and user-centred design approaches was taken through several user studies with integrated design decisions: surveys, co-creations, diary studies and usability testing. By taking this design approach, the project team was able to identify the challenges faced by industrial design students in their digital space, allowing for the creation of Rethink. The experience designed for this project is a design that is similar to an exhibition design, the students can visit it once or every so often and experience a moment of deep reflection. This moment is critical to create a deeper level of awareness and create an open space to encourage conversation with peers. Through extensive user studies including survey, co-creation sessions, and diary studies, it was learnt from industrial design students that they miss this deeper level of awareness because they are aware of their daily screen time but lack any depth in that awareness.

Process

The design process was highly iterative, with a total of six iterations. The first two iterations focused on product design, while the other iterations focused on experience design. The demo day concept and the final design incorporated most of the feedback from the user studies (e.g. co-creation, diary study and demoday testing). The design approaches used in this project included user-centred design and data-enabled design. User-centred design integrated the outcomes of user research into the design decision-making process, utilising methods such as surveys, co-creation, diary studies and explorative prototypes. The data-enabled design utilises the data collected from user research to guide hands-on design explorations, with validation taking place in the context of everyday life.

The Rethink Experience

The Rethink Experience was created to address the issue of awareness in reflecting for Industrial Design students (e.g. the users) on their digital space. It consists of an interactive tangible design that invites the user to move the timeline ring and press the colourful LED buttons. Rethink can be found in open spaces in or around design campuses where people are free to interact with it. After interacting with the design, the user receives an aftercare email with an overview of their personal digital space based on the inputted data and personal tips that give feedback and guidance, encouraging a better digital-wellbeing. These tips can be revisited over time, especially in critical moments for the student. The user could revisit Rethink at any time, and their digital space will be updated with new data through their interaction. New feedback will be given to encourage an ongoing journey of growth but behaviour change is not its goal. This experience aims to increase awareness foremost but also offers the opportunity for ongoing personal growth and development if needed. Industrial Design students frequently use multimedia and are associated with digital technologies for education, work and leisure throughout the day which can make it difficult to balance their physical and digital lives. The Rethink Experience provides a unique opportunity for Industrial Design students to reflect and grow, making it a valuable addition to their academic and professional lives.

2. Related Works

Smartphones have become a big part of our daily lives and give us the ability to connect to other people, content, and services any time and place (Duke & Montag, 2017) with people using them on average around 2,600 times per day (Winnick, 2022). Students, in particular, spend a significant amount of time on their phones (8-10 hours per day), potentially leading to a struggle to divide their attention across multiple devices and a risk of interruptions (Roberts et al., 2014). This can result in challenges in managing and processing the vast amounts of information delivered to our devices on a daily basis (Cecchinato & Cox, 2017). These digital devices also pose challenges to our autonomy, as people who frequently use their smartphones are at risk of information overload (Winnick, 2022).

Digital Consumption

Heavy smartphone use has been linked to negative impacts on social activities, work and study, sleep and health, and emotional well-being (McDaniel & Drouin, 2019; Duke & Montag, 2017; Lanaj et al., 2014; Büchi et al., 2019). Many people, particularly young adults and teenagers, report feeling like they spend too much time on their screens and express a desire to reduce screen time, but often struggle to do so (Jiang, 2020). Disconnection from social media is often temporary and situational, and may involve disconnecting from devices, specific applications, or certain features or people (Nguyen, 2021). These disconnections may not always result in long-term benefits as they are often temporary (Monge Roffarello & De Russis, 2019).

Digital Well-Being

Digital well-being refers to the balance between the benefits and harms of mobile connectivity. It is a subjective experience that is influenced by personal, device-related, and contextual factors (Vanden Abeele, 2020). While digital technologies can provide many benefits, they can also have negative impacts on mental health due to their potential for addiction, which can manifest in physiological, psychological, and social problems (van Velthoven et al., 2018).

Digital Detox

To address issues with digital well-being, some individuals turn to digital detox, while alternative approaches such as mindfulness training and habit-formation strategies may also be effective in promoting sustainable changes in digital device use (Monge Roffarello & De Russis, 2019; Vanden Abeele, 2020). Digital detox is a trend in which people refrain from using electronic devices, such as smartphones, in order to reduce stress and focus on social interaction in the physical world (Radtke et al., 2021). While there are products designed to help people balance their screen time, they are often not thoroughly evaluated and may not be effective in promoting long-term behaviour change (Almourad et al., 2021; Monge Roffarello & De Russis, 2019). Digital Self-Control Tools (DSCTs) offer a potential solution, but currently only focus on smartphones. There is potential for DSCTs to be adapted for use with multiple devices, which may be more effective than lock-out mechanisms (Monge Roffarello & De Russis, 2021). However, there is a risk that these tools could be used to manipulate users and shift their acceptance of such manipulation (Widdicks, 2020).

2. Related Works

Micro-escapes

Micro-escapes are short, frequent breaks from work tasks that allow people to mentally disengage and refocus (Müller et al., 2018). These breaks can be used to recharge and restore cognitive resources, leading to increased productivity and well-being (Boksem & Meijman, 2008). Research suggests that micro-escapes can be effective in reducing stress and increasing job satisfaction (Müller et al., 2018). However, micro-escapes may not always be feasible or appropriate, depending on the specific context and individual circumstances (Müller et al., 2018). It is also important to ensure that micro-escapes do not interfere with work tasks or productivity (Boksem & Meijman, 2008).

Digital devices are often used as a means of engaging in micro-escapes as these devices provide access to a range of leisure activities (Müller et al., 2018). Digital devices can be used in a variety of locations, making them convenient for taking breaks on the go (Müller et al., 2018). They also provide a wide range of options for engaging in leisure activities, allowing individuals to choose activities that align with their interests and preferences (Boksem & Meijman, 2008). However, there is a big concern for addiction, as certain activities, like social media and gaming, can be highly rewarding and potentially addictive (Yen et al., 2017). Excessive use of digital devices has therefore been linked to negative impacts on mental health, such as increased stress and anxiety (Pantic et al., 2019).

3. Benchmark Landscape

Benchmarking was one main activity in informing design directions and supporting decisions. The benchmarks were collected at different stages of the project, usually at the start of iterations. 173 benchmarks were studied (see Figure 3.1), applying thematic analysis (Braun & Clarke, 2006), with methodology presented in Figure 3.2. This chapter summarises the main findings of benchmark research. For the complete analysis and references, see Appendix B.

Figure 3.1 - 173 Benchmarks

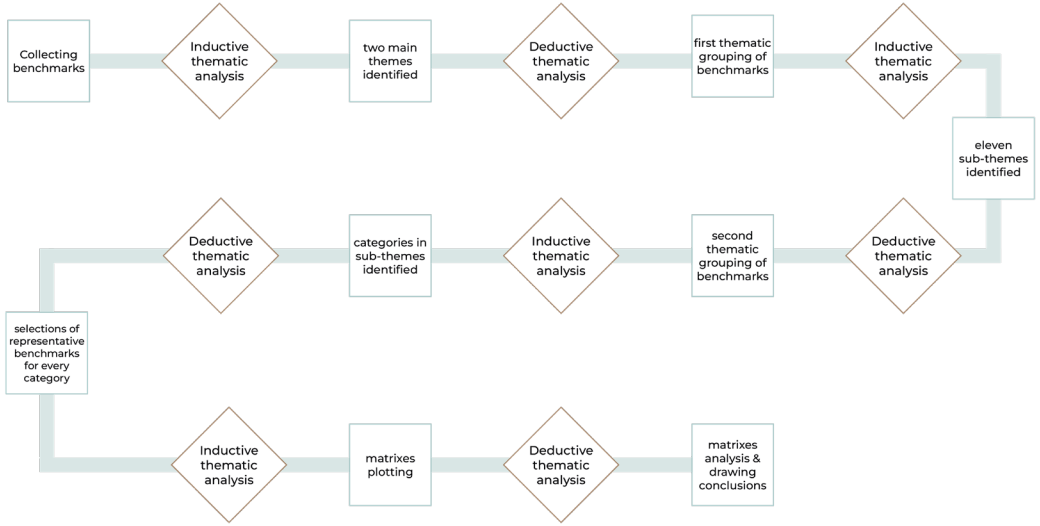


Figure 3.2 - Benchmark thematic analysis (Braun & Clarke, 2006)

3.1 Digital Well-being Benchmarks

Digital well-being is getting attention as phone industries start to incorporate digital well-being in their software like Apple with IOS (Marsden, 2018). Digital detox tools were found to be designed using 5 approaches: infographics, office spatial designs, seamless interaction designs, phone applications, and personal products.

These benchmarks focused on providing objective data insights. However, they were not effective enough to keep the users actively practising digital detox and improving digital well-being over the long term (Monge Roffarello & De Russis, 2019). Additionally, tangible designs for digital well-being remained to be underexplored.

3.2 Experience Design Benchmarks

Experience designs were studied for understanding the approach and opportunities for advancements. Currently, highly technological experience designs are often installations or products in social, open contexts. They are interactive, multi-sensorial, and embody human-technology interactions. Moreover, some experience designs used little to no technology. They tell stories through texts and visuals or are purely aesthetic. In some cases, they ask visitors for input and present the impact. Overall, experience designs could be more purposeful in triggering critical reflections and providing takeaways for digital well-being.

3. Benchmark Landscape

3.3 Analysis: Plotting The Matrices

The selected 34 benchmarks based on the thematic analysis performed were plotted on nine matrices, with two sets of dichotomies each time. The dichotomies used are shown in Figure 3.3, and the entire set of matrices can be found in Appendix B.5. The main interest design domains for this project are shown as the green circle areas in the graphs. Two examples are shown in Figure 3.4 and Figure 3.5. These visualisations inform about the opportunities for the project, presented in Chapter 3.4.

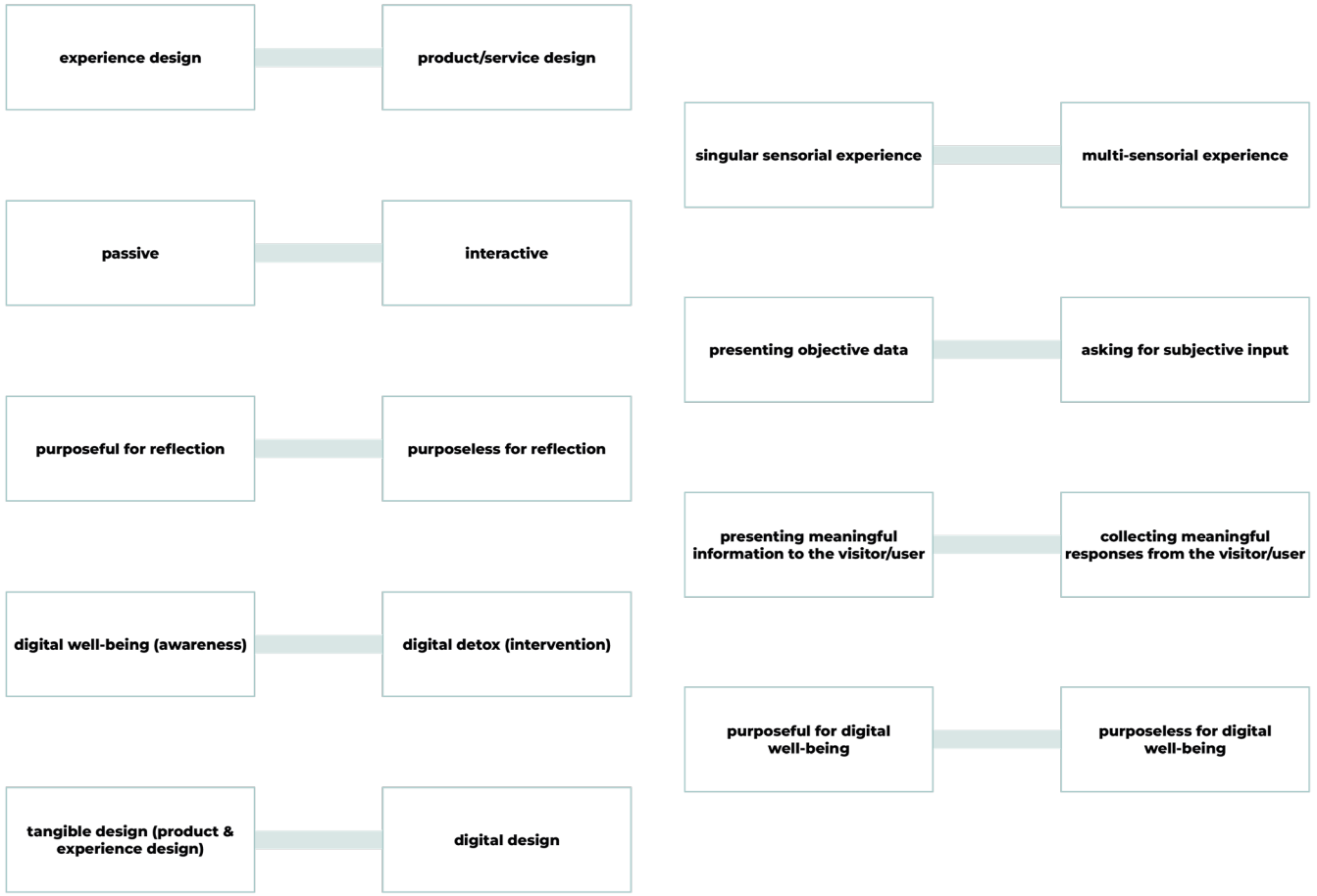


Figure 3.3 - Benchmark dichotomies

3. Benchmark Landscape

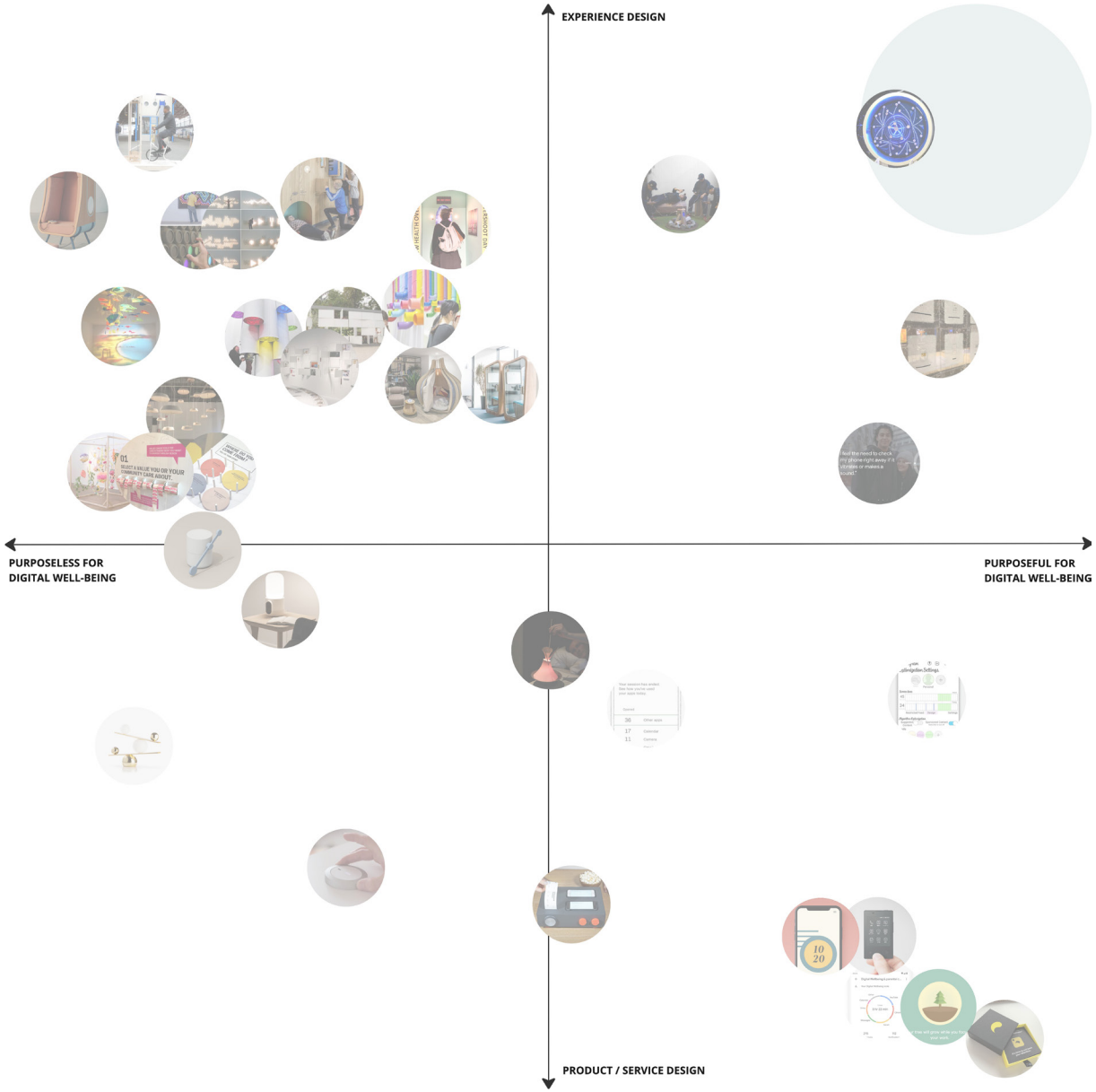


Figure 3.4 - Experience-product, purposeless-purposeful digital well-being reflection matrix

3. Benchmark Landscape

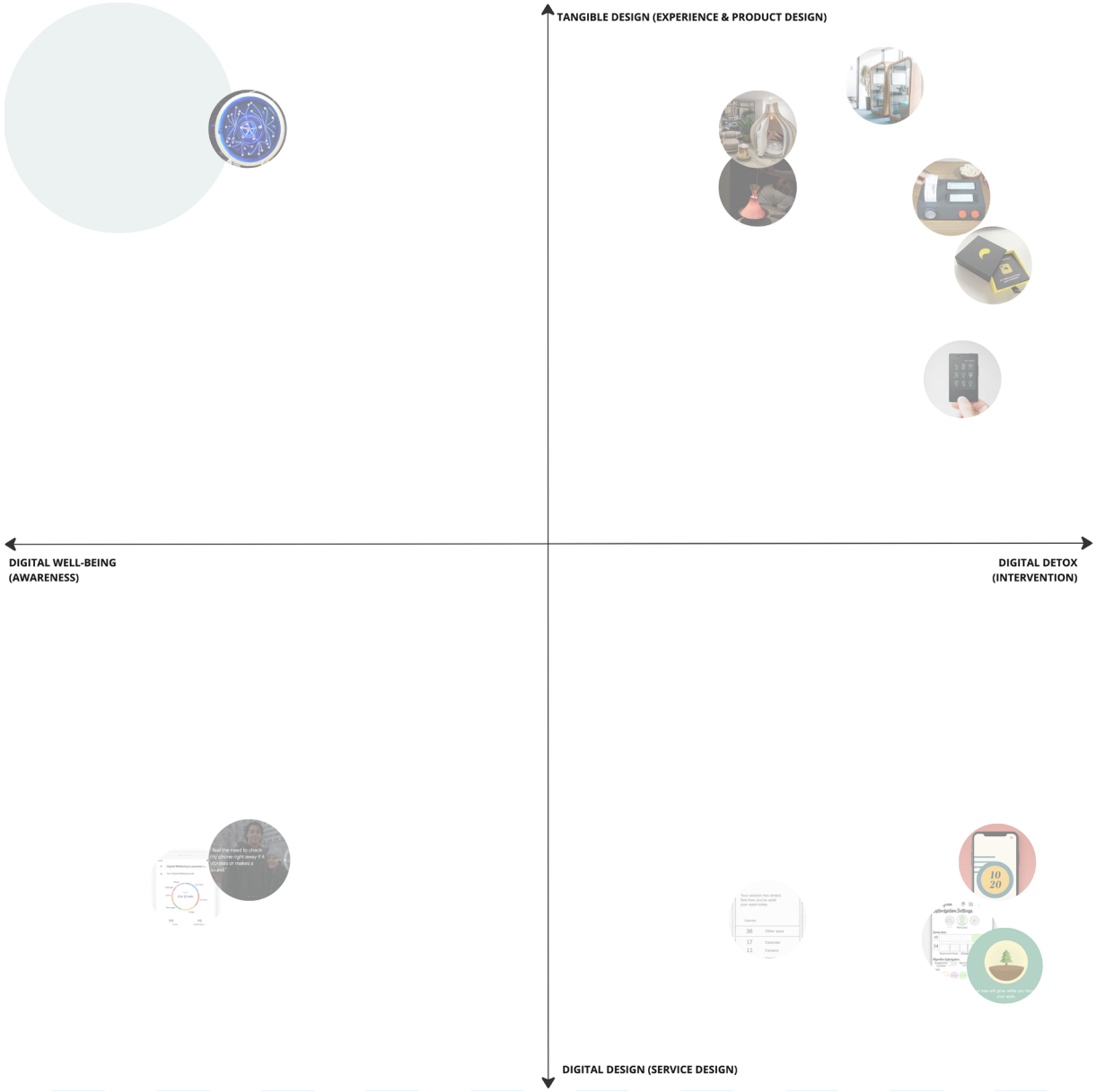


Figure 3.5 - Tangible-digital, purposeful-purposeless reflection matrix

3.4 Conclusion: The Gaps As Opportunities

The benchmark analysis brought a few main opportunities for design. First, most product/service benchmarks focused on providing data insights to users. It presented a gap of not providing enough stimuli for the users to understand the overall picture of and reflect on their digital well-being.

In addition, the experience designs were found to not always be reflective, especially for reflecting on digital well-being. Therefore, an opportunity was identified to design a purposeful experience design for creating awareness about the presence of digital space and triggering reflections. To ensure that the experience is pleasant, the design should, or at least could try to be interactive and multi-sensorial. Moreover, the design should both present information to visitors, and collect input data as a reflection tool.

Overall, the benchmark research validated the experience design approach to be used for creating awareness of digital well-being while also providing insights into the characteristics of an experience design. It gave us a better and clear understanding of the market- and design landscape that we are aiming to design in.

4. Design Process

This chapter explains the design process throughout the project in a nutshell. In total, four iterations were completed. The end of one iteration informed the next iteration. The first two iterations focused on product/service designs. Afterwards, it was found that raising awareness and triggering critical reflections was more important than a commercial product/service. This enabled a switch to experience designs, with a data-enabled approach (Bogers & van Kollenburg, 2019), for the last two iterations.

Iteration 01

The first iteration was done as a pressure cooker (Studio Louter, n.d.). It started with benchmark research and ideation related to digital detox/well-being (Figure 4.1). Productivity and digital distractions were explored further through Crazy-8 ideation (Core Method, n.d.) and conceptualisation (see Appendix C.1), with the target group Gen-Z, who are the first digital natives (Petrock, 2021; Selig, 2022). Combining insights, this iteration ended with a room intervention design that allows the user to leave the phone outside, and experience one specific notification at one time through rich interactions and feedback (Figure 4.2).

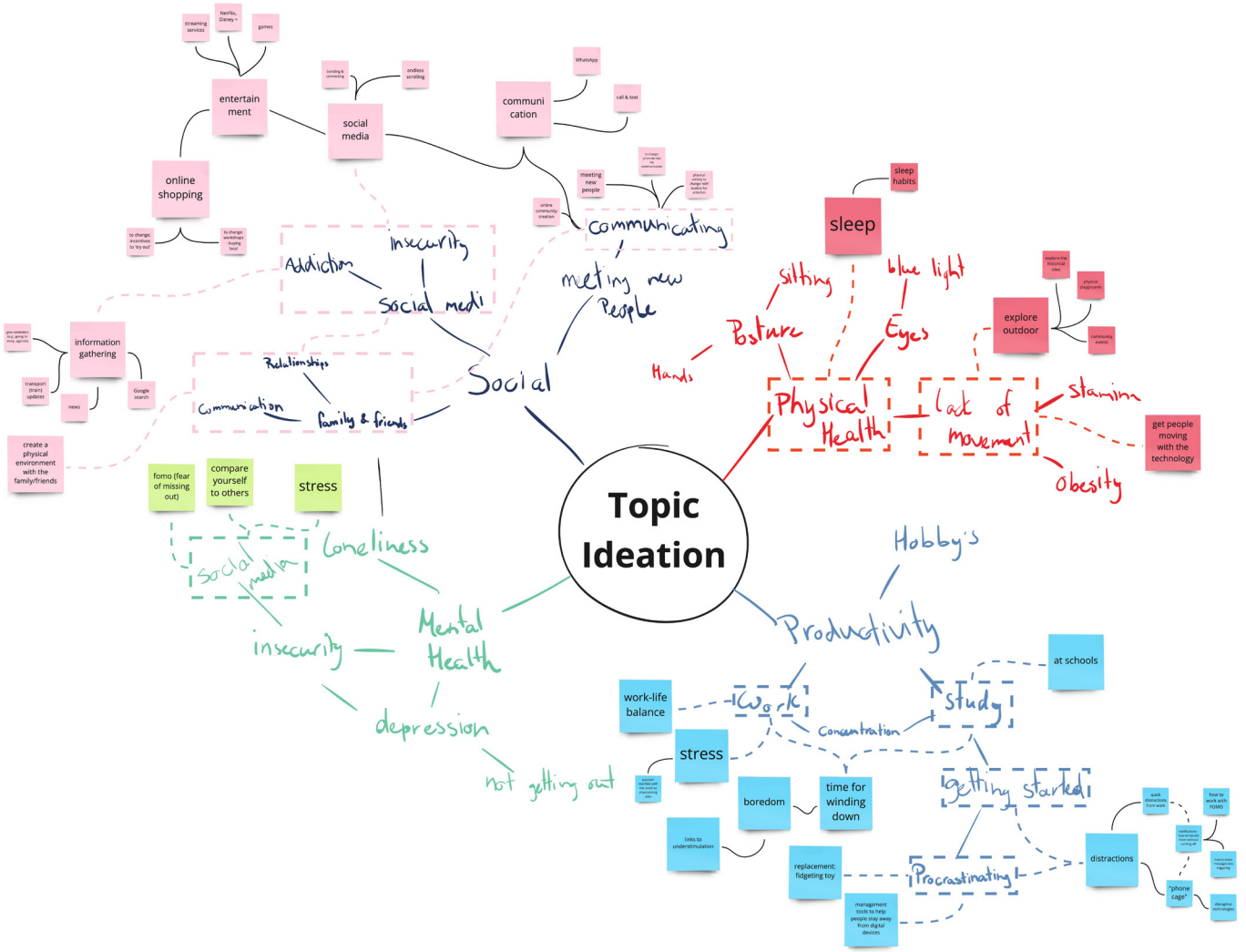


Figure 4.1 - Ideation related to digital detox/well-being

4. Design Process

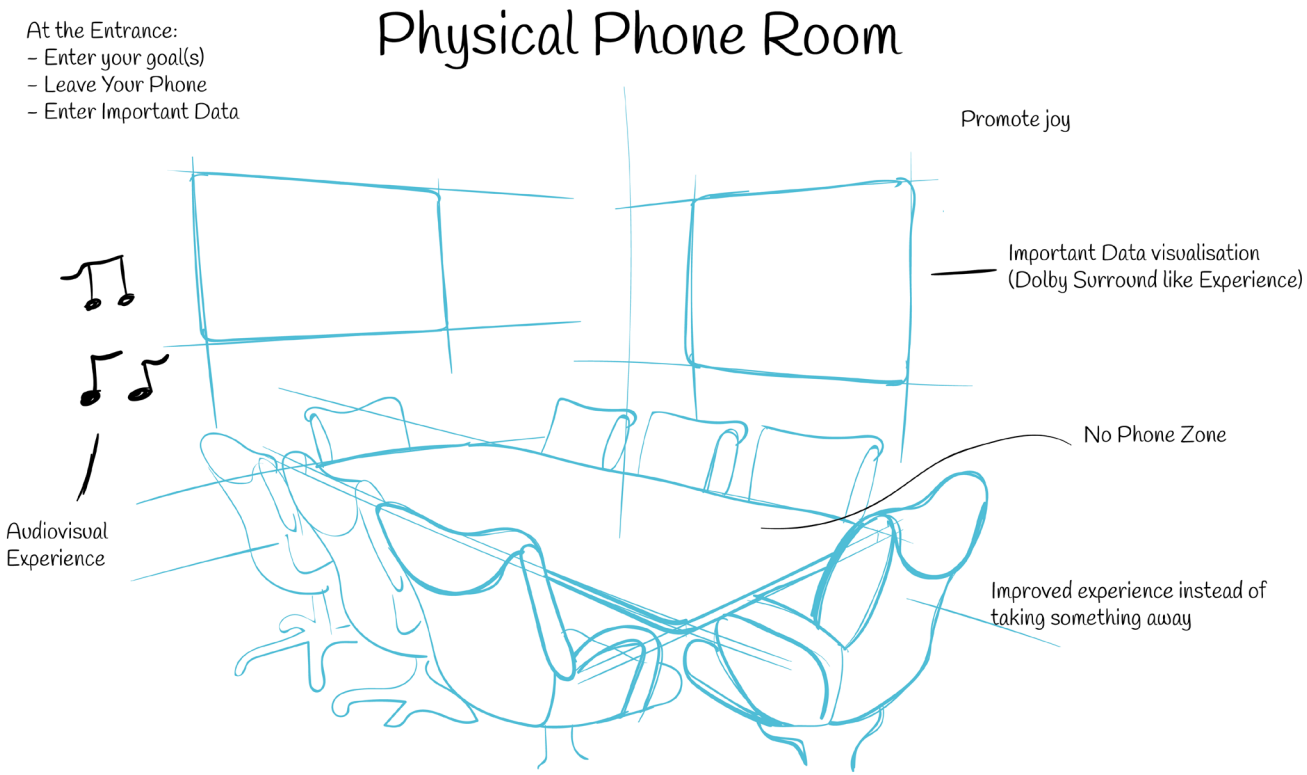


Figure 4.2 - Iteration 01 conceptual sketch: multi-sensorial phone room intervention

Figure 4.3 - Topics explored in literature research

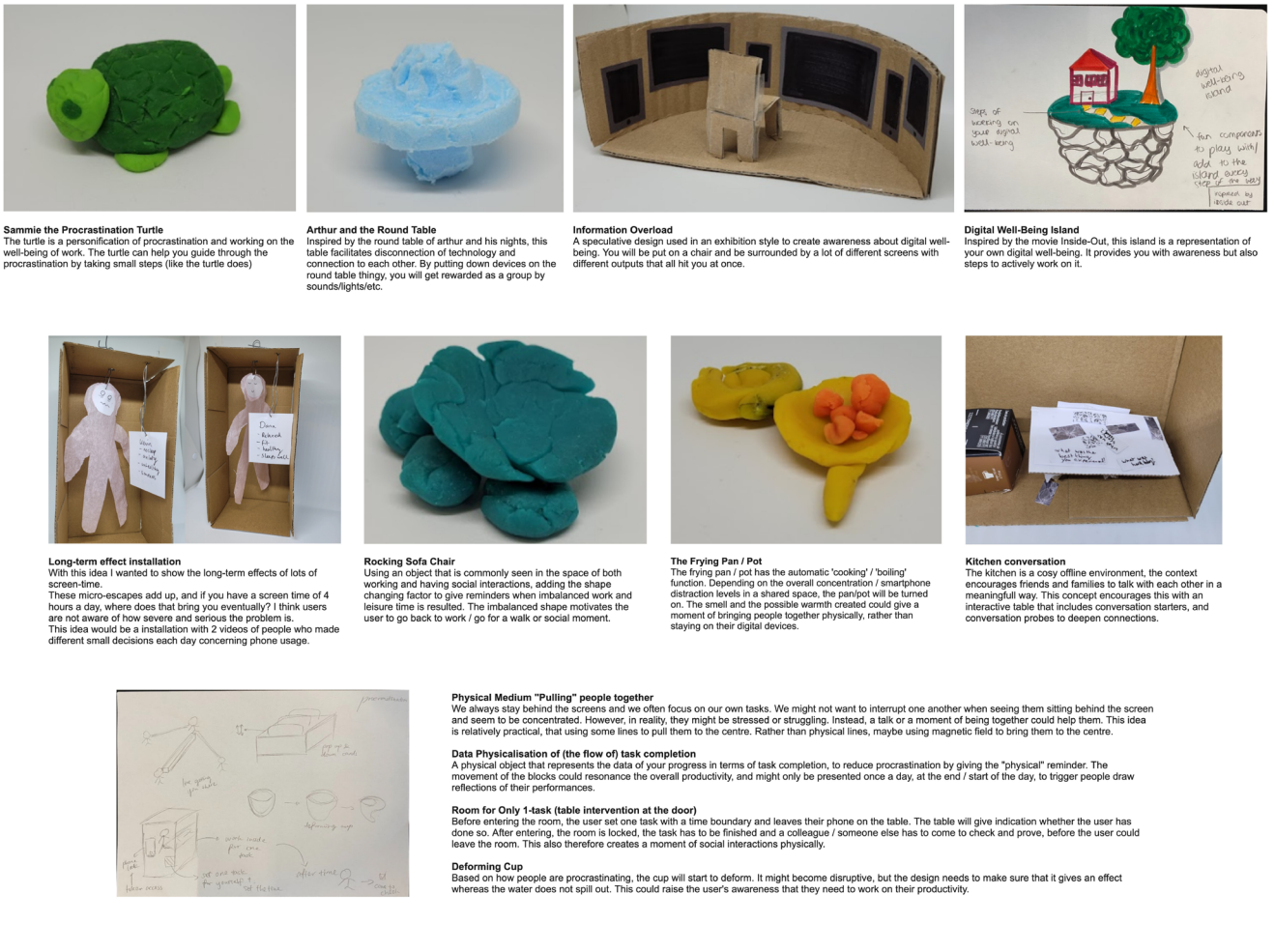
4. Design Process

Iteration 02

Evaluating Iteration 1, digital space was found far beyond productivity. Therefore, several topics related to digital well-being were studied (Figure 4.3) through literature and benchmarks (see Chapters 2 and 3).

It was still challenging to make actionable design decisions. Hence, both first- and second-person perspective approaches were taken. A survey was designed to understand user gains, pains, and wishes with digital well-being (see Chapter 5.1). In parallel, an adapted Crazy 8 approach (Core Method, n.d.) was used: low-fi modelling one or more ideas every eight minutes for four rounds (Figure 4.4 & Figure 4.5), with seven ideas conceptualised later through sketching (Figure 4.6, Appendix C.2). The analysis created the concept of this iteration: educating and intervening with the user in small steps to improve digital well-being through a personal product as a multi-sensorial 'island' (Figure 4.7).

The design was reflected as the use of natural elements being too concrete to link to digital well-being. Therefore, a step back was taken as analysing the survey findings. It was noted that most participants - industrial design students, could not define their digital space. An understanding needs to be created before intervening. This iteration ended with deciding to reframe the problem and design space.



Sammie the Procrastination Turtle
The turtle is a personification of procrastination and working on the well-being of work. The turtle can help you guide through the procrastination by taking small steps (like the turtle does)

Arthur and the Round Table
Inspired by the round table of arthur and his nights, this table facilitates disconnection of technology and connection to each other. By putting down devices on the round table thingy, you will get rewarded as a group by sounds/lights/etc.

Information Overload
A speculative design used in an exhibition style to create awareness about digital well-being. You will be put on a chair and be surrounded by a lot of different screens with different outputs that all hit you at once.

Digital Well-Being Island
Inspired by the movie Inside-Out, this island is a representation of your own digital well-being. It provides you with awareness but also steps to actively work on it.

Long-term effect installation
With this idea I wanted to show the long-term effects of lots of screen-time.
These micro-escapes add up, and if you have a screen time of 4 hours a day, where does that bring you eventually? I think users are not aware of how severe and serious the problem is.
This idea would be a installation with 2 videos of people who made different small decisions each day concerning phone usage.

Rocking Sofa Chair
Using an object that is commonly seen in the space of both working and having social interactions, adding the shape changing factor to give reminders when imbalanced work and leisure time is resulted. The imbalanced shape motivates the user to go back to work / go for a walk or social moment.

The Frying Pan / Pot
The frying pan / pot has the automatic 'cooking' / 'boiling' function. Depending on the overall concentration / smartphone distraction levels in a shared space, the pan/pot will be turned on. The smell and the possible warmth created could give a moment of bringing people together physically, rather than staying on their digital devices.

Kitchen conversation
The kitchen is a cosy offline environment, the context encourages friends and families to talk with each other in a meaningfull way. This concept encourages this with an interactive table that includes conversation starters, and conversation probes to deepen connections.

Physical Medium "Pulling" people together
We always stay behind the screens and we often focus on our own tasks. We might not want to interrupt one another when seeing them sitting behind the screen and seem to be concentrated. However, in reality, they might be stressed or struggling. Instead, a talk or a moment of being together could help them. This idea is relatively practical, that using some lines to pull them to the centre. Rather than physical lines, maybe using magnetic field to bring them to the centre.

Data Physicalisation of (the flow of) task completion
A physical object that represents the data of your progress in terms of task completion, to reduce procrastination by giving the "physical" reminder. The movement of the blocks could resonance the overall productivity, and might only be presented once a day, at the end / start of the day, to trigger people draw reflections of their performances.

Room for Only 1-task (table intervention at the door)
Before entering the room, the user set one task with a time boundary and leaves their phone on the table. The table will give indication whether the user has done so. After entering, the room is locked, the task has to be finished and a colleague / someone else has to come to check and prove, before the user could leave the room. This also therefore creates a moment of social interactions physically.

Deforming Cup
Based on how people are procrastinating, the cup will start to deform. It might become disruptive, but the design needs to make sure that it gives an effect whereas the water does not spill out. This could raise the user's awareness that they need to work on their productivity.

Figure 4.4 - Crazy 8 low-fi modelling

4. Design Process

Offline Micro-escapes
The phone is often used for micro-escapes: a short escape from your daily life. I want to give users an alternative to have a offline option for this. This concept is a box full of offline micro-escapes that users can access anytime they need it. It can be used in groups or individually.

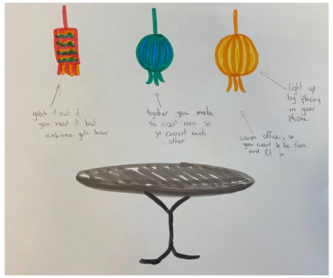
The Disconnection Cloud
The disconnection cloud helps to represent the amount of disconnection present in a certain room. It changes shape and colour upon the amount of disconnection of technology.

Chandelier / No Distraction Area
Initial idea: (prototype not finished) a hexagon lamp that could open up and close off in the shared space to provide feedback on digital wellbeing.
Iterated idea: a hexagon chandelier that could be in the open space of university / office. It gives the space for people to stay concentrated. A bit inspired by bank self-service machine compartments. To have the privacy.

Kitchen chair gamefication
The kitchen is a cosy offline environment, the context encourages friends and families to talk with each other in a meaningfull way. To spend more time in this context this concept gamifies a kitchen chair which multiple games can be played with. When dinner is served everyone gets a notification and the last person on their chair loses. This concept encourages time in the kitchen to deepen connections.

Imbalanced Meeting Table
The middle big block is a miniature of a table. The bottom of the table is built with small components that could be moved around to result in a shape changing effect. The table is located in the meeting room, while the bottom physicalises the distraction levels of the workers/group members sitting around the table, having a meeting in an anonymise and physical form on the group level. The imbalanced data representation could thus suggest for taking a break, or brining up as a discussion topic to create social interactions among the group members.

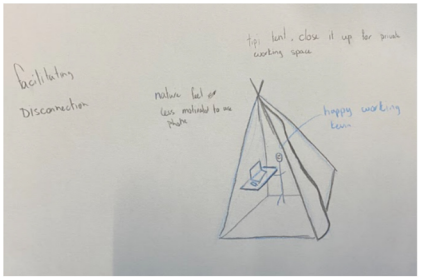
Console Like Working Area
Gaming consoles like arcade games can be very addictive, so the idea is to use the same idea, but then for the purpose of work. By having the colourful lights and encouraging sounds and algorithms the idea is to get people hooked on working and they would be sucked into deep work instead of distractions



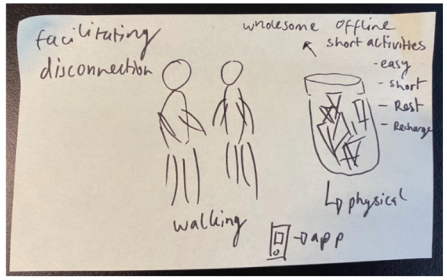
Lanterns of No Distraction
Lanterns hanging from the ceiling, in which all parties can place their phone, so that is won't be distracting them. When placed in the lantern, the lantern turns on to create a great ambiance. As everyone would like the greater ambiance, people will try to create a community together in which it is encouraged to put your phone away, and everyone can see it if you do not put it away.

Swinging Chair
A swinging chair, in which people could sit on while working. A room would be filled with these chairs, in which no phones were allowed. By having this playful area be desirable, the idea was that people would like to give up their phones for a better experience

No Distraction Room
A room/sitting area which would close yourself from the outside world if you wanted to go in a focus mode. However, if you use your phone, it would open up, as you are no longer focused on work, so that means other people can also approach you.



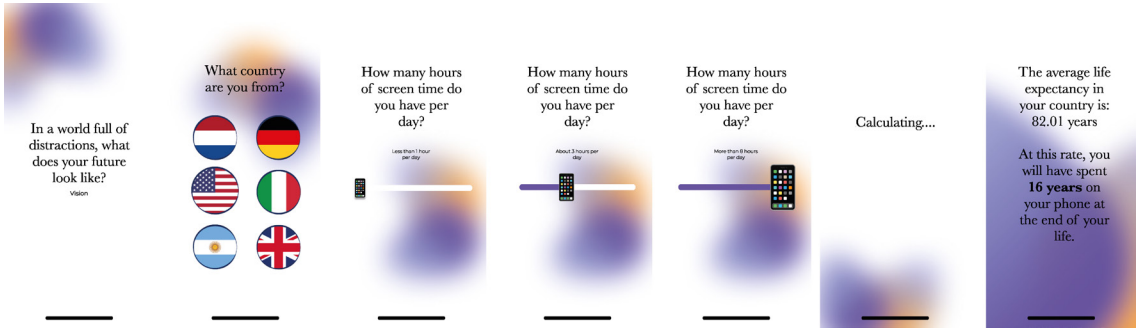
Facilitate Disconnection Tent
The idea here is similar to the no distraction room. The goal is to offer a place to disconnect from the outside world, as well as from digital distractions. The aesthetics would be a tent, in which you would create a nature like feel for the people working in it. You could close of your tent to have your own working space in which you would have no distractions laying around.

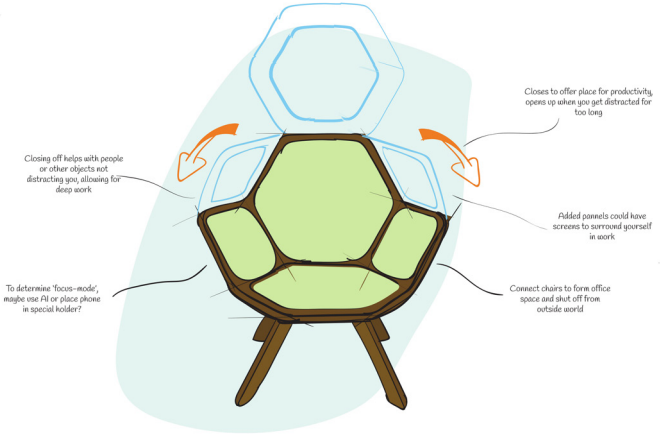


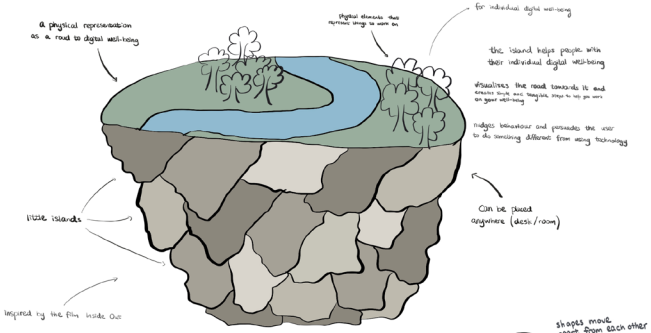
Facilitate Disconnection IdeaPot
When studying in a group it's good to take small breaks, right now a lot of people go on their phone during breaks. IdeaPot facilitates disconnection through giving fun offline activities that are easy and short. It gives users a fun resting and recharge activity.

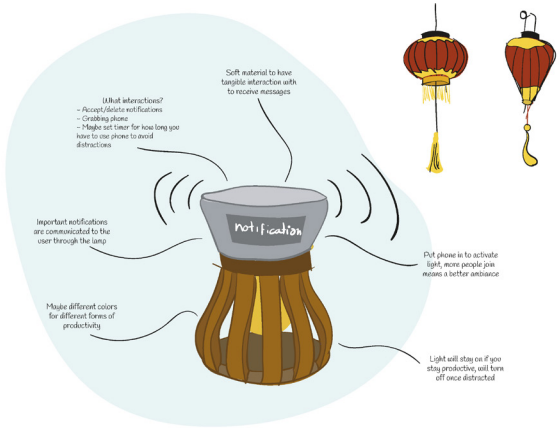
Figure 4.5 - Crazy 8 low-fi modelling

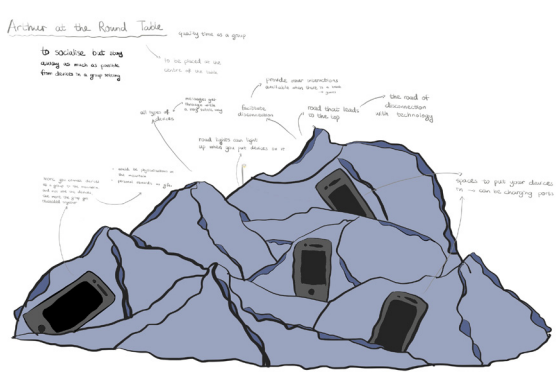
4. Design Process











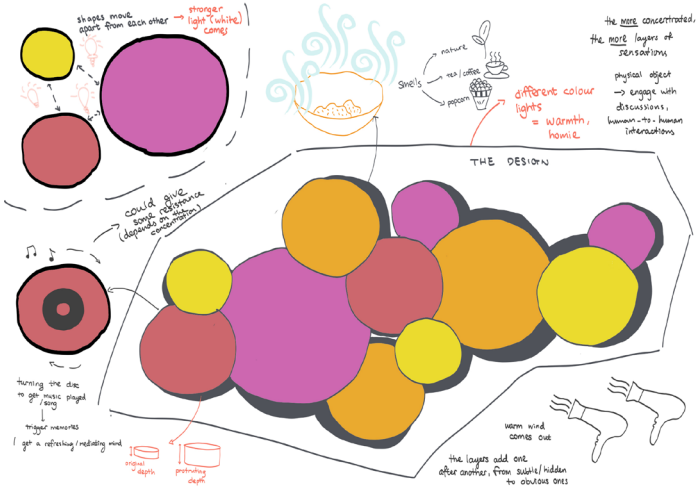


Figure 4.6 - Seven ideas from crazy 8 conceptualised through sketching

4. Design Process

Figure 4.7 - Iteration 02 conceptual sketch: personalised product - a digital well-being 'island'

4. Design Process

Iteration 03
The new reframed problem space is industrial design students who use multimedia for both work/study and leisure face challenges in having the time and space to reflect on their digital well-being. Instead of product designs, the goal changed to encouraging industrial design students to reflect on their interactions with digital technologies, through a reflective, experience design in semi-public spaces.

Literature research was conducted to identify approaches/processes for creating an experience design (Figure 4.8), and which Ethnographic Experiential Futures (Candy & Kornet, 2017) was found to be the best fit. Additionally, benchmarks were studied to understand the characteristics and purposes of experience designs (see Chapter 3.2). Thereafter, the midterm design was designed (Figure 4.10 & Figure 4.11): a data mapping tool with magnets on a whiteboard for both current and future digital space (Figure 4.9 & Figure 4.12). The analysis of mapping and feedback was presented in Chapter 5.2. In short, it showed the potential of a mapping and critical reflection tool for digital space to create a deeper level of awareness.

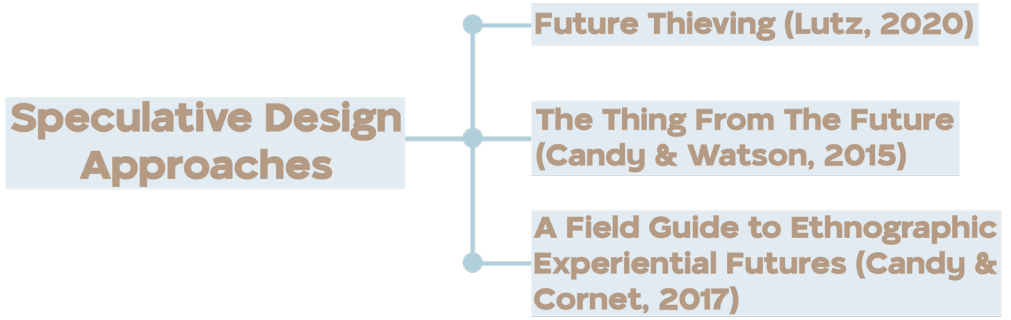


Figure 4.8 - Approaches/processes for creating an experience design

Figure 4.9 - Midterm demoday

4. Design Process

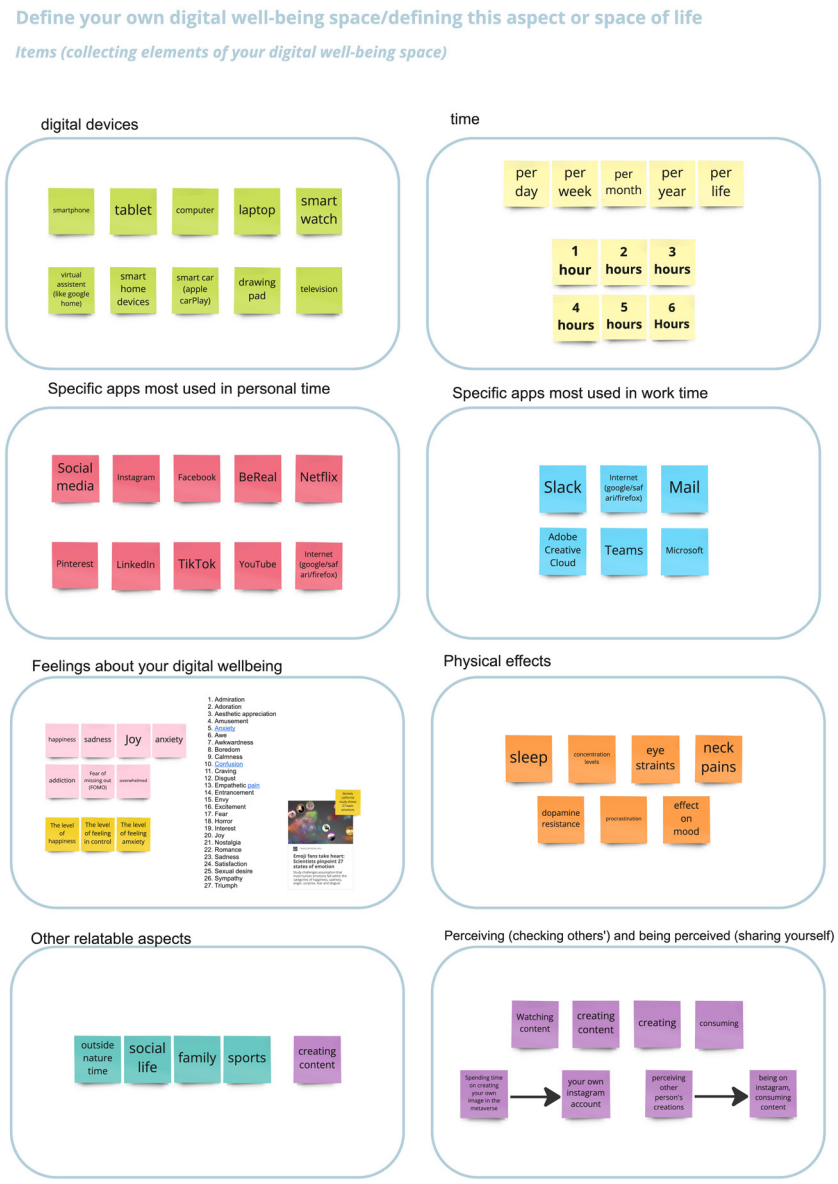


Figure 4.10 - Midterm demoday design ideation part one

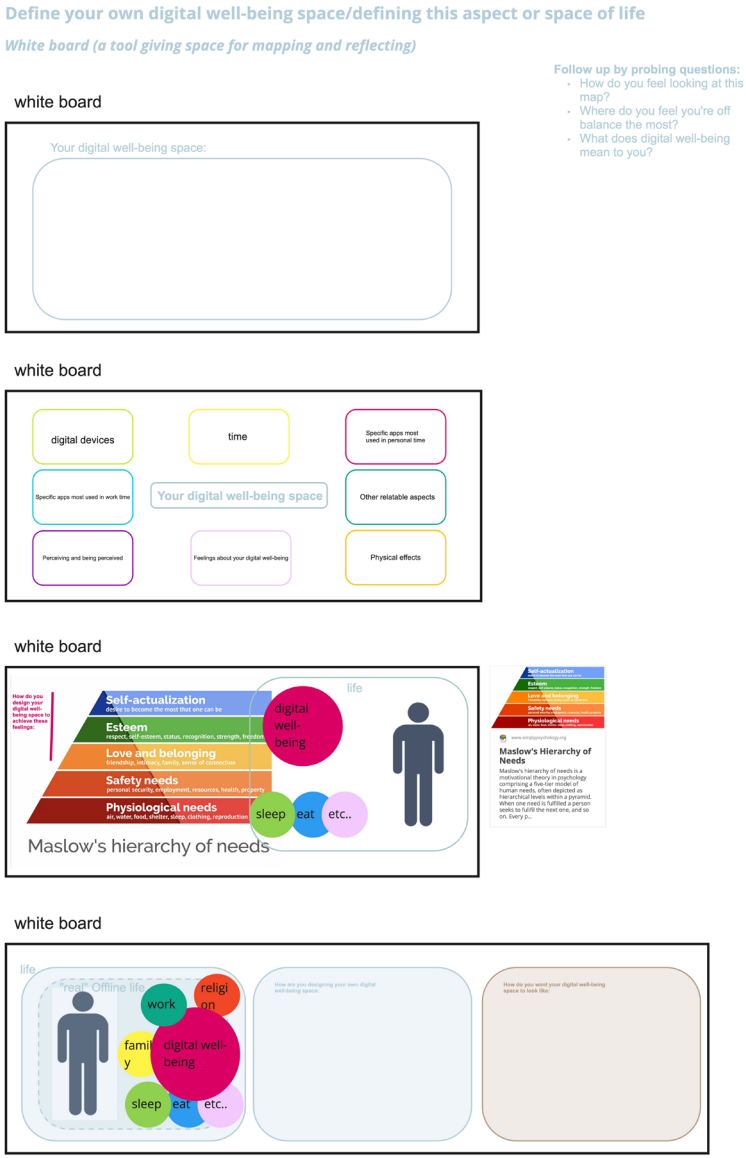


Figure 4.11 - Midterm demoday design ideation part two

4. Design Process

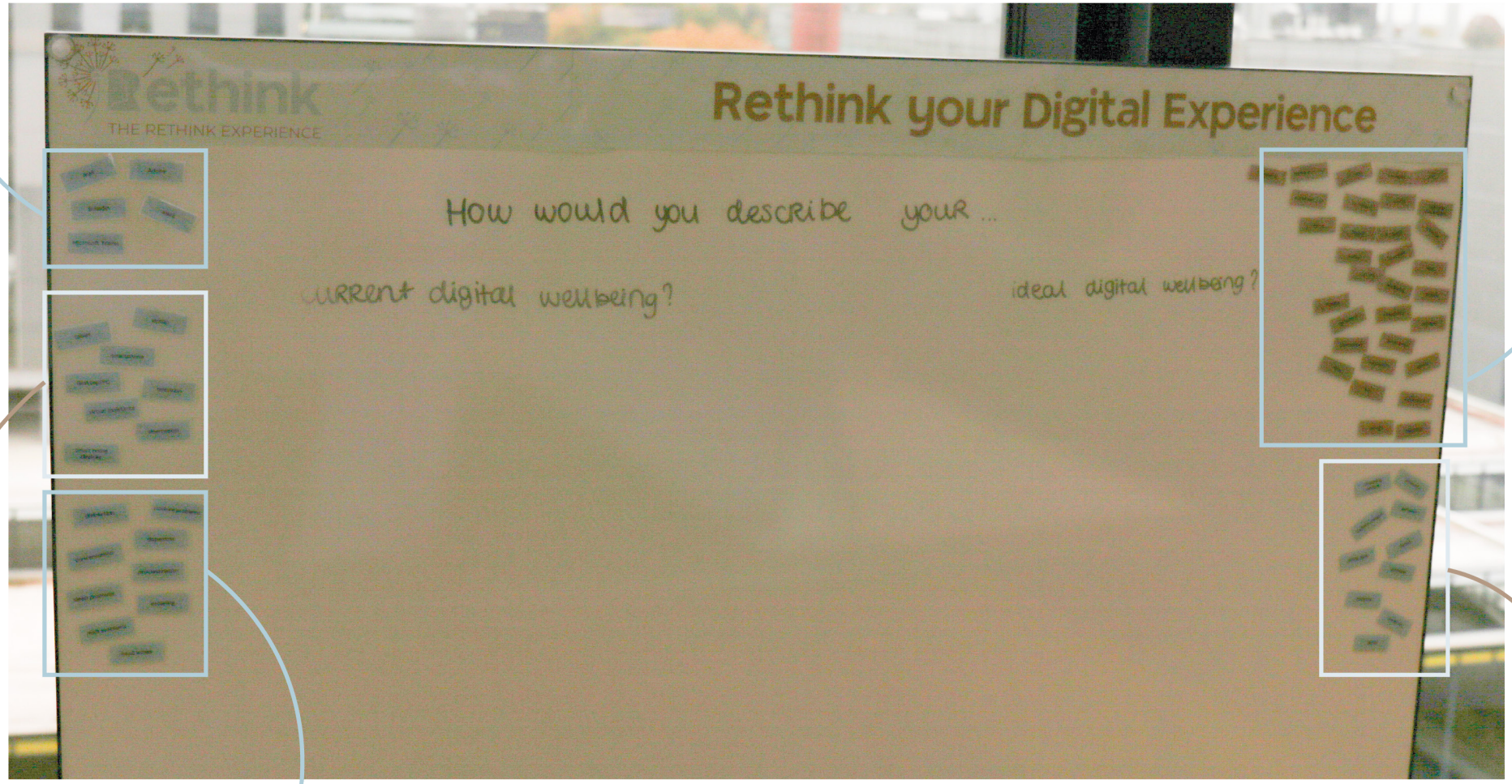


Figure 4.12 - Testing & getting feedback with Iteration 03 prototype

4. Design Process

Iteration 04

Iteration Three showed the digital space of industrial design students is huge. Therefore, it was decided to identify one main challenge through co-creation sessions with users (see Chapter 5.3), while using diary studies (see Chapter 5.4) to grasp what the emotions are around digital space in everyday life.

The most significant friction found in digital space for industrial design students was connectedness. They are connected through digital technologies for university study, work, and leisure. Therefore, the design challenge was specified further: How can we show connectedness and its associated emotions through a physical, data-enabled experience design?
A round of ideation (Figure 4.13) and benchmarking (Figure 4.14) followed. It led to identifying and exploring three sub-fields: form and layout (Figure 4.15), connectivity of digital technologies and emotions (Figure 4.16), and electronic/ mechanical feasibility (Figure 4.17). Simultaneously, the first iteration of a painted laser-cut model was created (Figure 4.18). This sub-iteration led to decisions made in four pillars (Figure 4.19). Further detailing was continued in exploring several themes (Figure 4.20 & 4.21): layout & layers; (interactions with the) timeline; height differences and sensation layer; interaction and data collection. Together with a scaled model creation for the final form (Figure 4.22), the design decisions were translated into technical decisions and plans for the prototype (see Appendix C.3). Along the process, explorations were done on incorporating emotions (Figure 4.22), group-level interactions (Figure 4.23, Figure 4.24), sensorial qualities as sound (see Appendix C.4) and tactile experiences were executed (Figure 4.25). Due to the limitations in time, the group-level interactions and sensorial qualities were not conceptualised which future work could tackle (see Chapter 8).

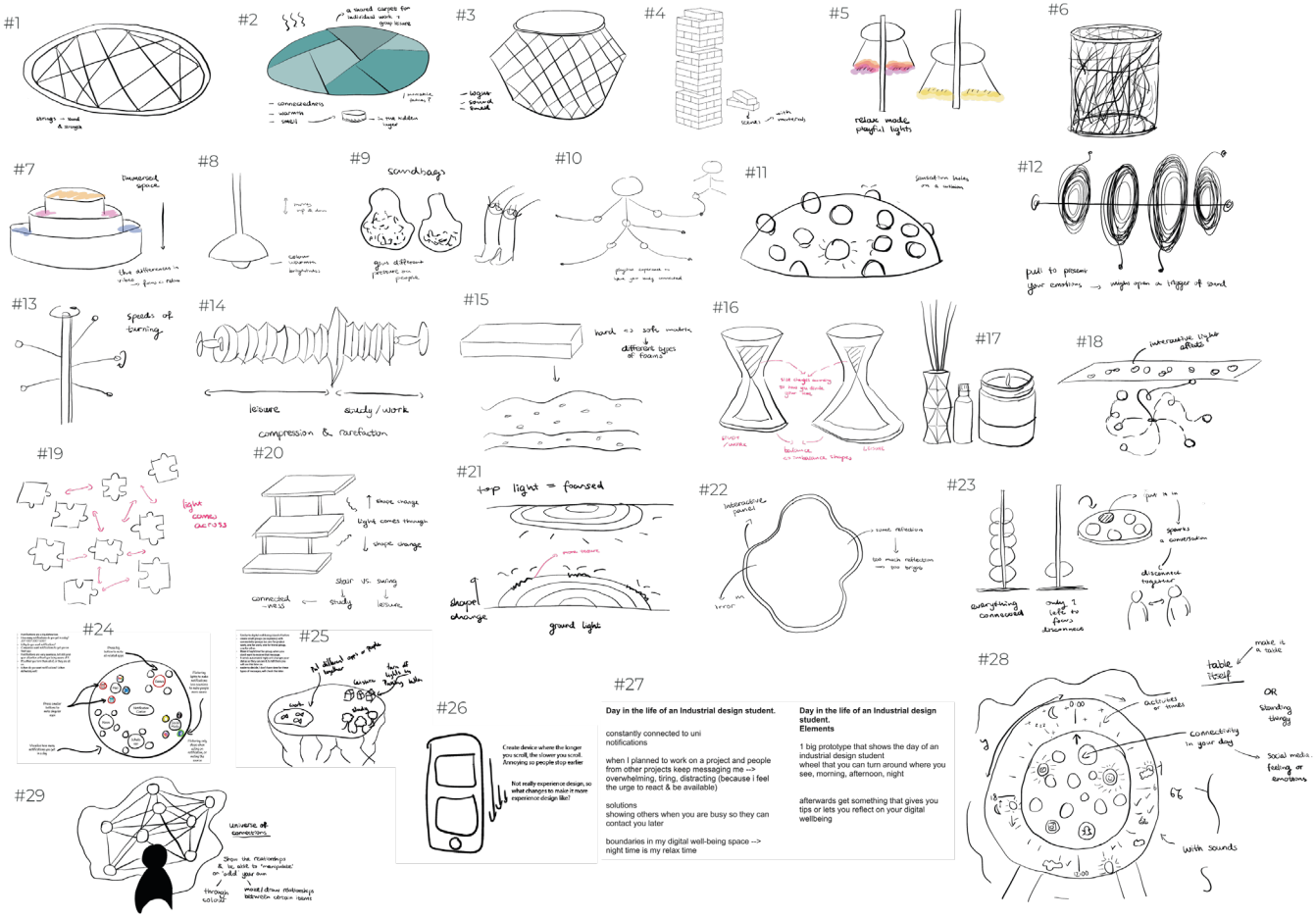


Figure 4.13 - Ideation sketches

4. Design Process

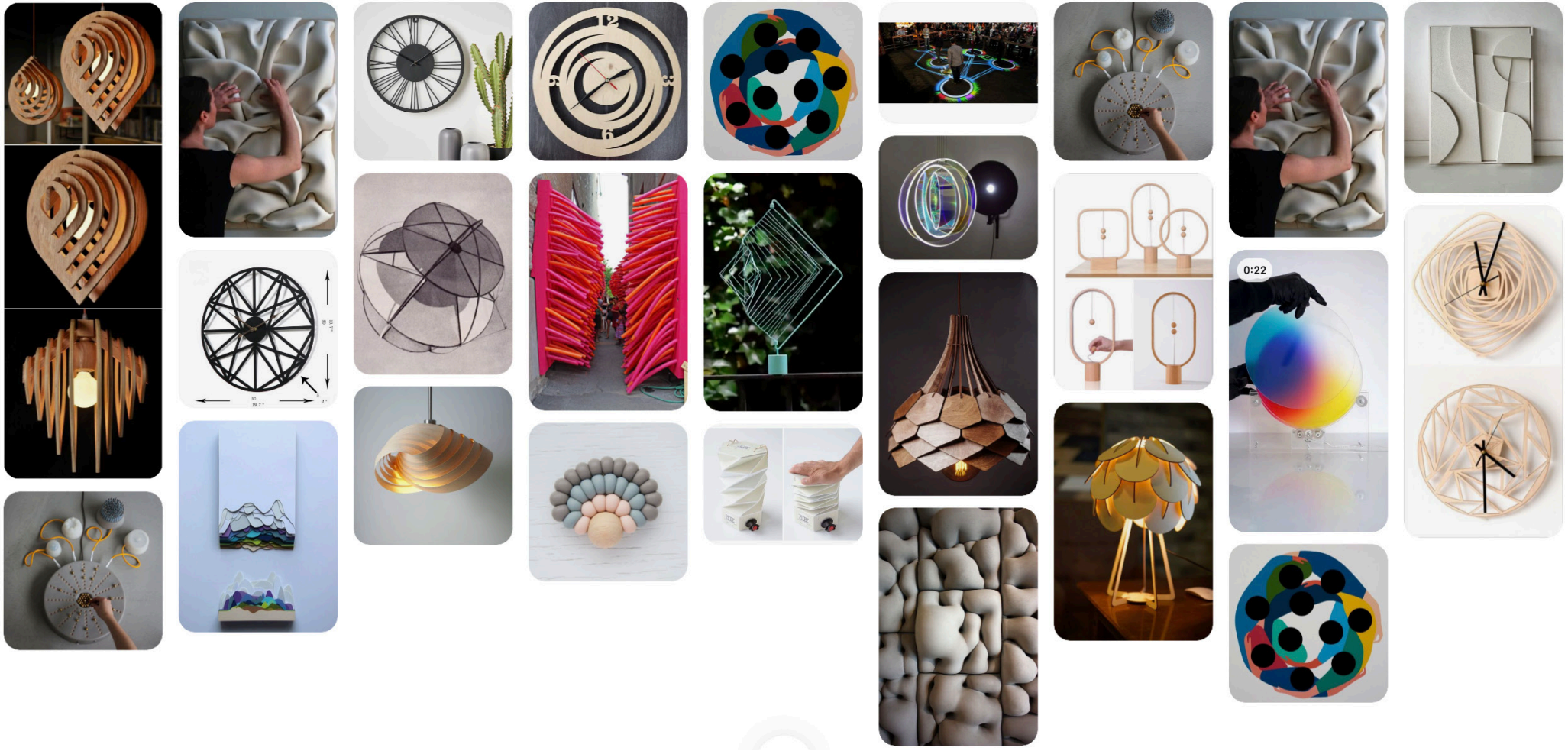


Figure 4.14 - Benchmark of physical, data-enabled experience design showing connectedness and its associated emotions

4. Design Process

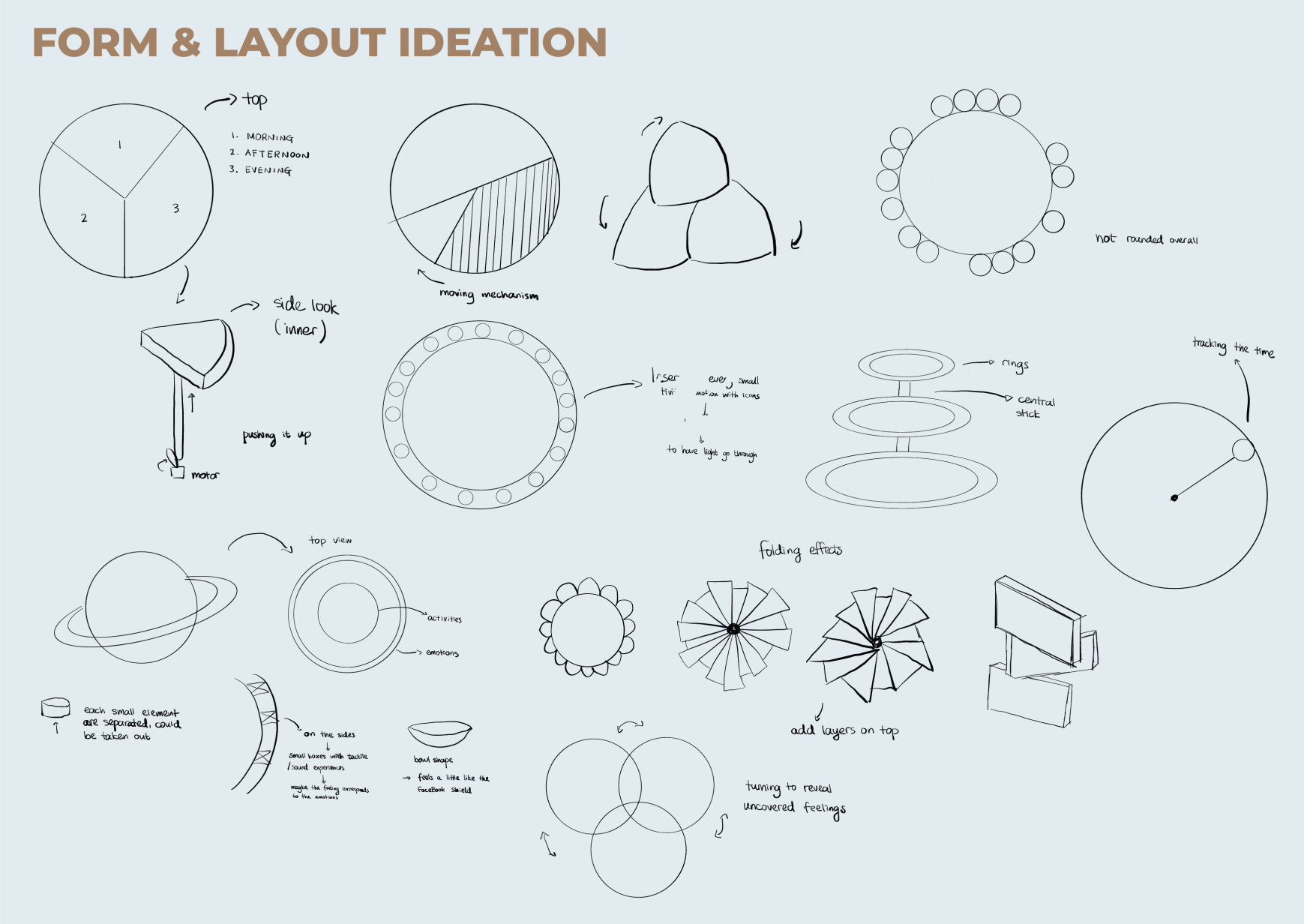
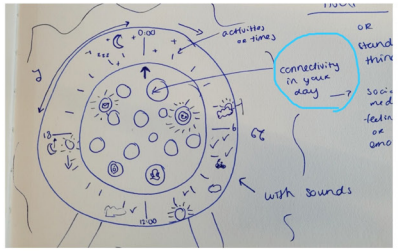


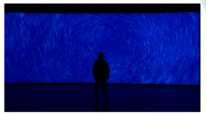
Figure 4.15 - Form & layout ideation

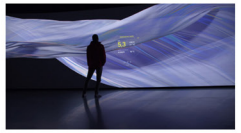
4. Design Process

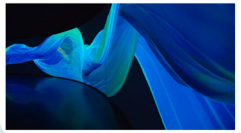
IDEATION OF REALISING CONNECTIVITY OF DIGITAL TECHNOLOGIES & EMOTIONS

Keywords: emotions, connectivity, reflecting, digital space









Coloured light
big waves of light that change during the day.

light represents emotion.

Lines in light represent connections

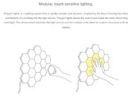
(Wu & Chu, 2022)

Light a candle
In the middle a lot of different colored candles are placed. Each candle represents something (anxiety, awe, happiness) light a candle if you feel that thing belongs in your digital well-being space.

candle = moment of reflection

melted wax accumulates over time. Map of everyones space.

(Aron, 2022; Jurvetson, n.d.; Hausette Team, 2020; ghadeeralhumood1, 2021)

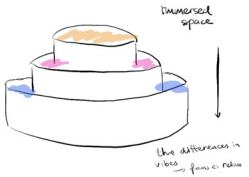


interactive tiles
Tiles that mean something light up during the day and die off again at night.

map of digital well-being

tiles of different project groups

(Vanderpant, 2022)



Height
Height can represent different things.

voting for different elements.

& **weight**

(Forero, 2022)

(Zhu et al., 2022)

with a "keycard" token
interactive through a keycard token.

balls of light turn.

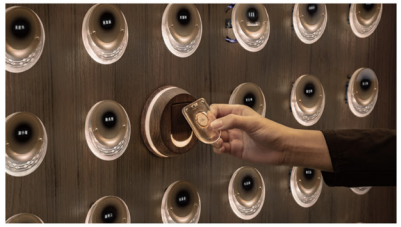


Figure 4.16 - Ideation of connectivity between digital technologies and emotions

ELECTRONICAL / MECHANICAL FEASIBILITY IDEATION

Sensors: collecting information	Actuators: presenting information	Other components
Gyroscope	stepper motor / DC motors (*rotation*)	microcontroller
Accelerometer	LED NeoPixel stripes/rings (*light*)	power supply / battery
Build-in motion sensor	servo motor (*shape change*)	data logger
Magnetometer	displaying modules (*light & visuals*)	
IR PIR motion sensor	speakers (*sound*)	
FSR sensor	buzzer (*sound*)	
	heating system	
	electron magnets	
	fans	

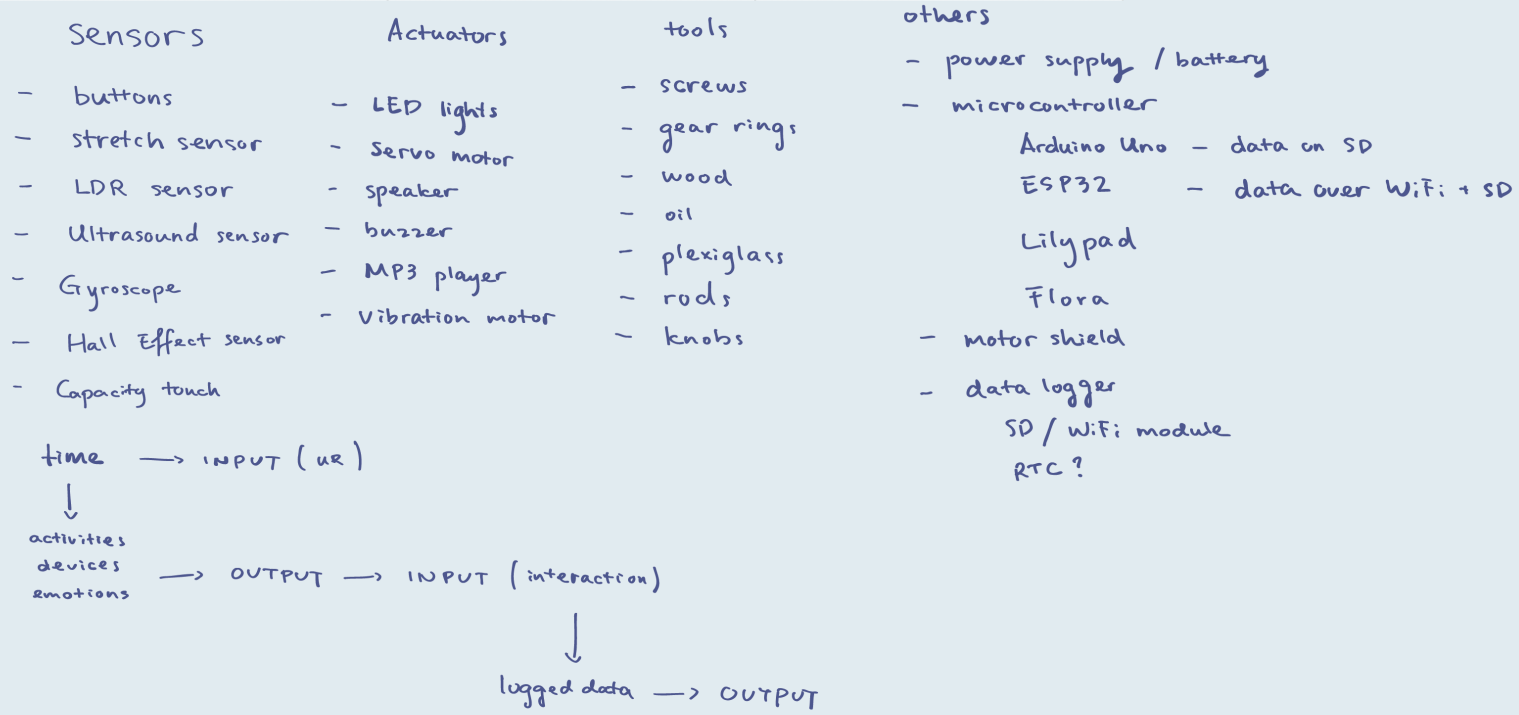


Figure 4.17 - Ideation of electronic/mechanical feasibility

4. Design Process

Figure 4.18 - First laser cut model

4. Design Process

Layout & shape

- the form will be circular & have rings as layers
  - represent the clock, the Earth, and water ripples
  - the feeling of calmness
  - invites for gathering
- has height differences
  - represent the level of depth in digital space

Timeline

- as the outest ring/layer
- can be turned
- needs to have a way connecting to the inner rings/layers for presenting the corresponding data
- data being collected with gyroscope for measuring the positions

Emotions

- will be included, in a tangible way
- based on the results of user studies, especially diary studies
- will be presented as corresponding to the timeline data

Interaction

- exploring group-level interactions, otherwise individual level
- invite people to reflect and discuss their digital well-being with the prototype

Figure 4.19 - Design decisions in 4 pillars

4. Design Process

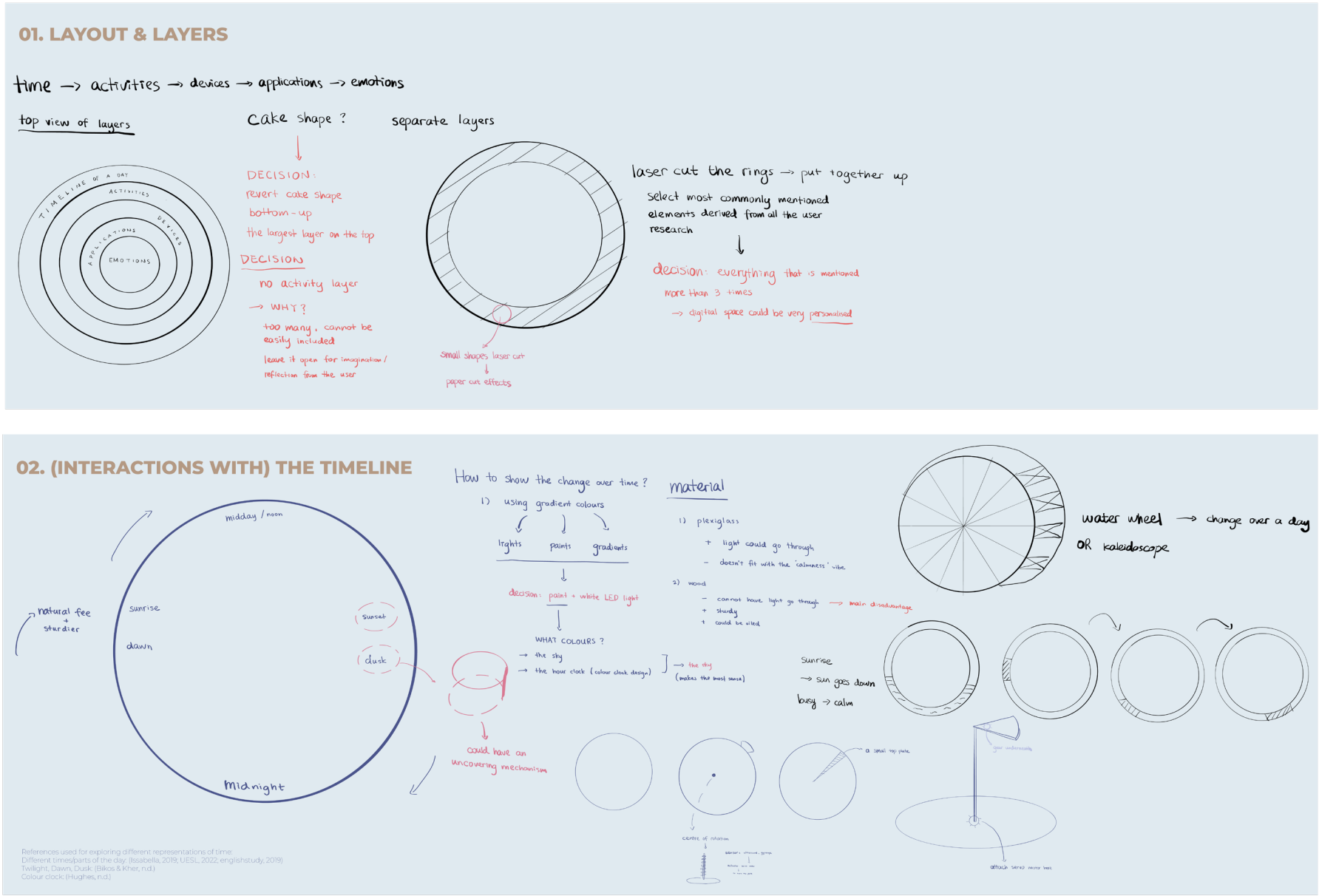


Figure 4.20 - Exploring layout, layers and interacting with timeline layer

4. Design Process

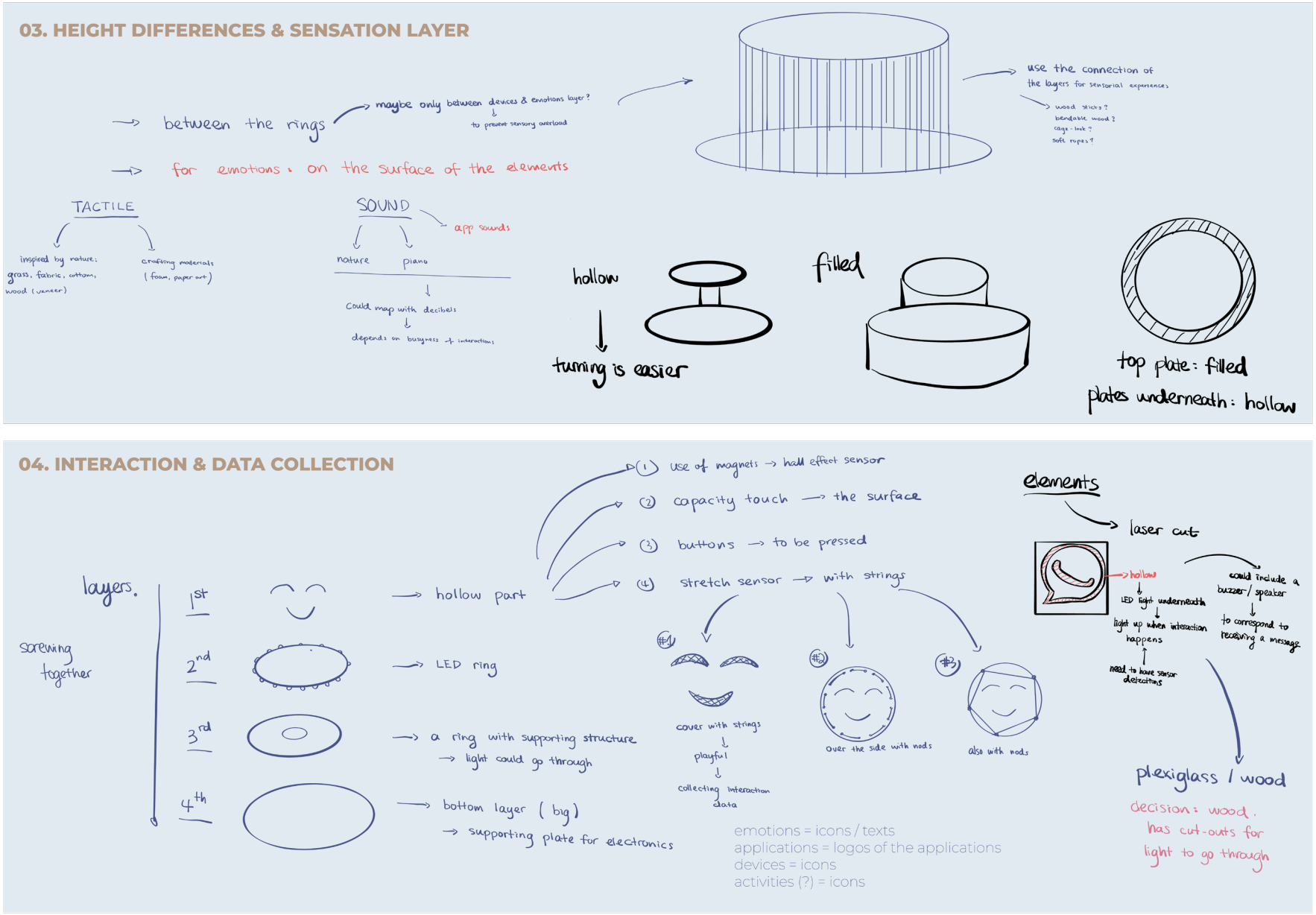


Figure 4.21 - Exploring layer height differences and user interactions with data collection

4. Design Process

Figure 4.22 - Exploring physical representations of emotions

Central part - emotions

Ideation for group experiences

Advantages for group experiences:
interaction, learn from each other, deeper meaning, conversation facilitator

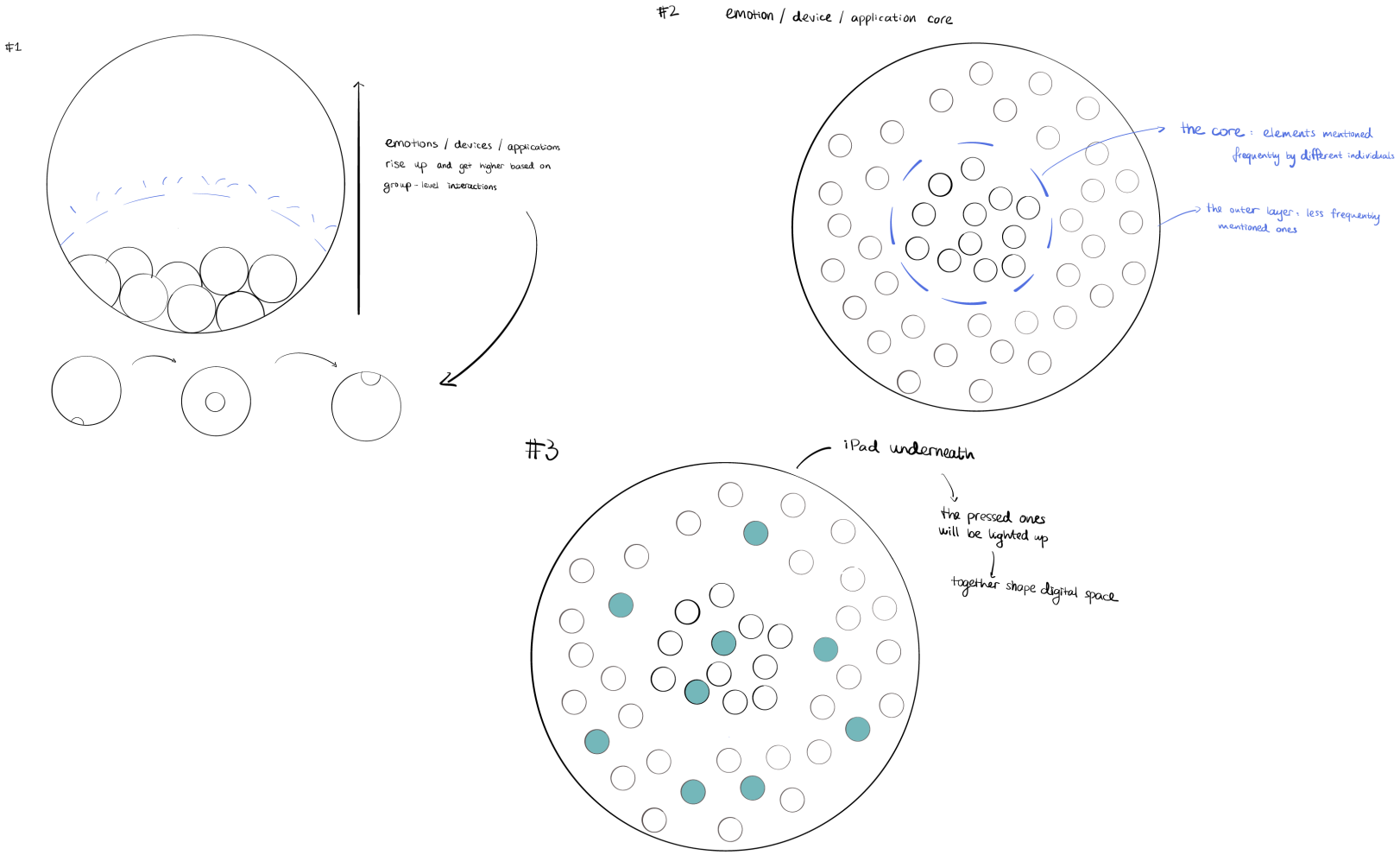


Figure 4.23 - Emotion exploration for group experiences

4. Design Process

Group Experience

Experience individually for a small part of the prototype and discuss together.

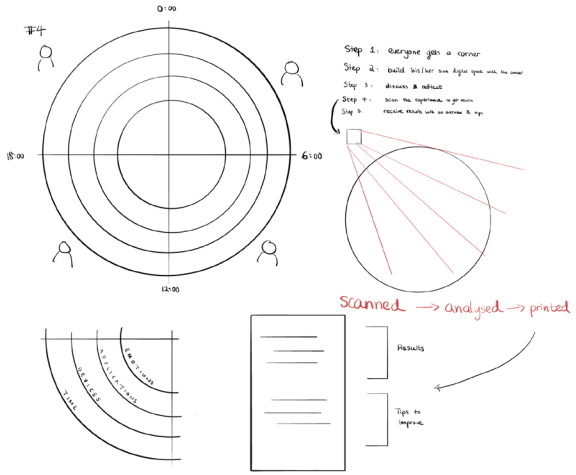


Figure 4.24 - Group Exploration

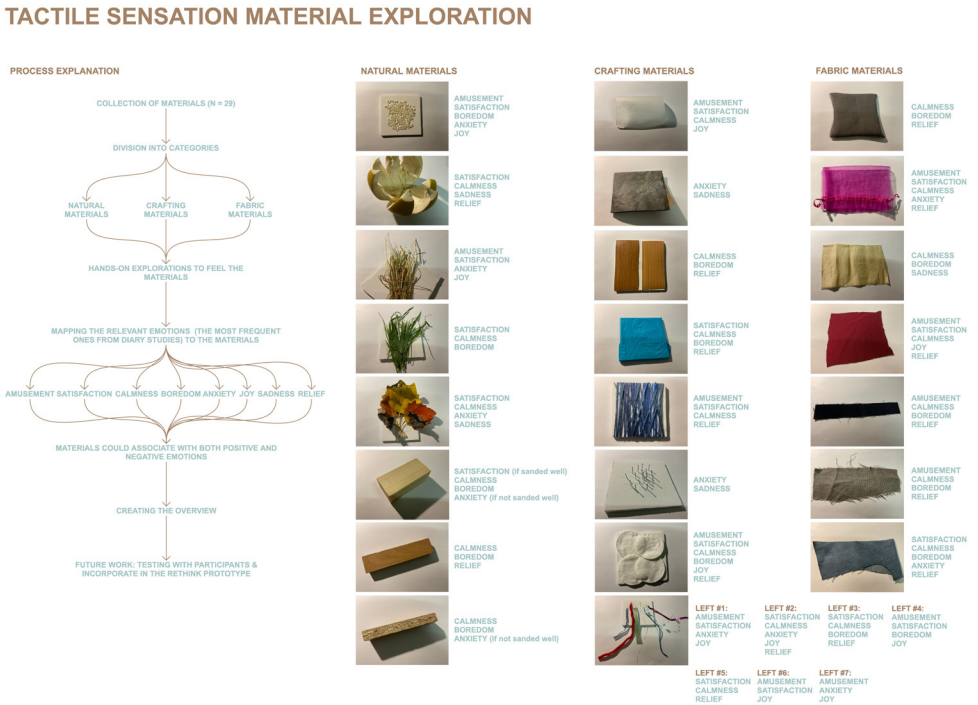


Figure 4.25 - Material explorations with tactile sensations

4. Design Process

Demoday Design

The design of the Rethink Experience, presented at the Demoday (Figure 4.26), was prototyped with laser cutting, electronics, and finishing. Rethink invites

Figure 4.26 - Final prototype

the visitor to consider his/her interaction with digital technologies throughout a typical day as an industrial design student. It is an experience design that encourages the visitors to take a moment of critical reflection. The outer ring, made of painted plexiglass (Figure 4.27), presents the 24 hours in a day. An overview of user research findings representing the user interactions and emotions with digital technologies was

Figure 4.27 - Laser-cut plexiglass

presented every two hours, with the LEDs lighting up in three layers (Figure 4.28). Due to the feasibility in time, the overview data was prototyped in series by changing the overview to the next two hours by

Figure 4.28 - Buttons with resin and LED lights

turning on/off the LEDs, with a delay in between for 30 seconds. Visitors were invited to first choose and write down a time (in a day) that they would like to reflect on their digital space. Afterwards, they interact and reflect with a handout (Figure 4.30) on the device layer, continue with the application, and lastly emotion layer. As the layer goes smaller towards the centre and deeper, the Rethink experience triggers reflections from the physical level in the space around to deeper inner reflections of emotions.

A few conceptual, supporting tools were used to explain the story next to the prototype (Figure 4.31): the user/customer journey map (final version see Chapter 6), the guiding process of interaction (Appendix C.5.1), the sign-up sheet (Appendix C.5.2), and the overall demoday experience (Appendix C.5.3). For the demoday prototype, its making process, with the technological and technical explanations, see Appendix C.

Demoday was also used as a user studies opportunity, enabling us to gather more data on the experience with Rethink. These insights, together with the results from the experience interaction as mentioned before, were used to create a new iteration which resulted in the final design presented in Chapter 6.

4. Design Process

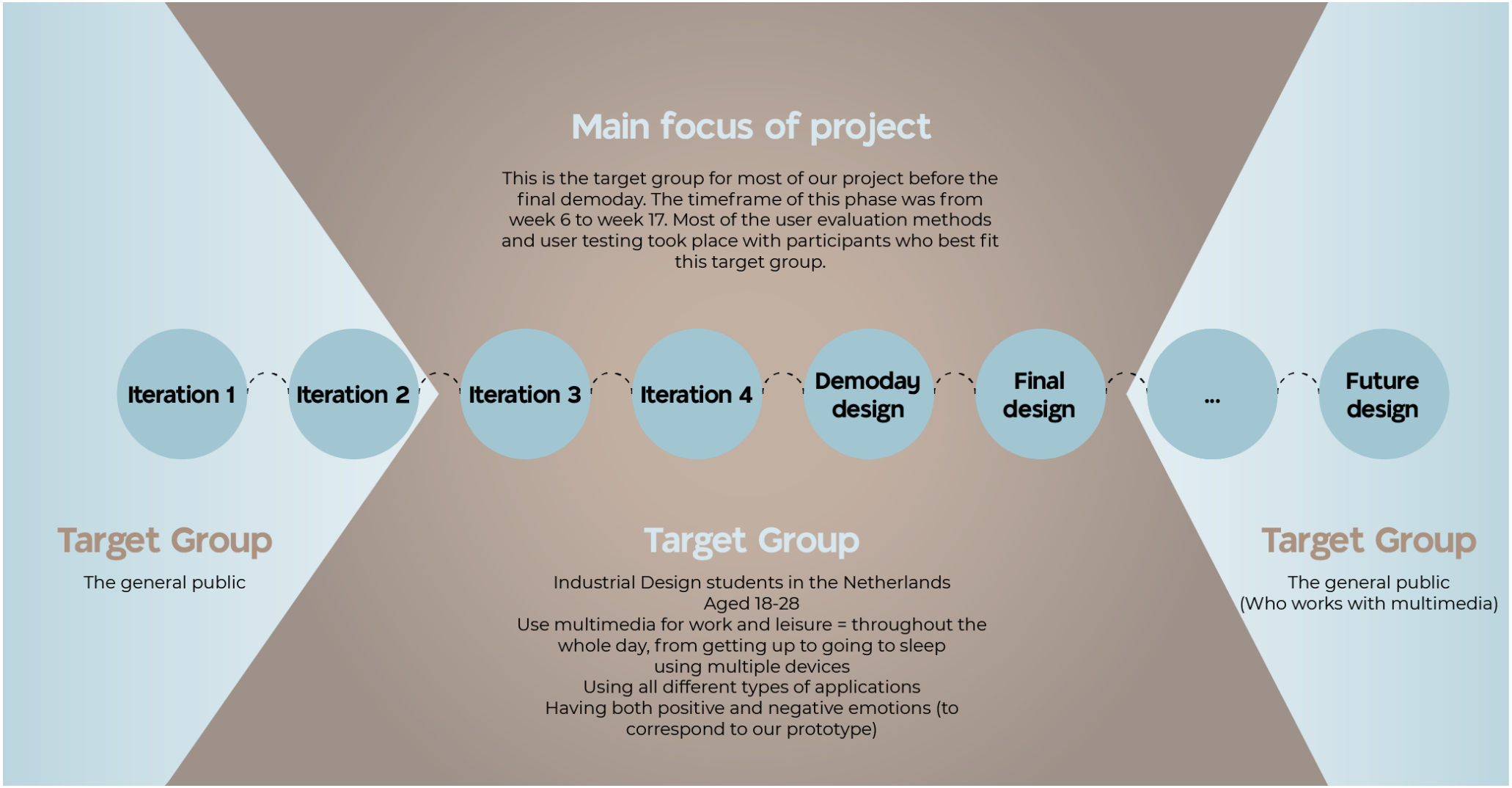


Figure 4.29 - Target group exploration process

4. Design Process

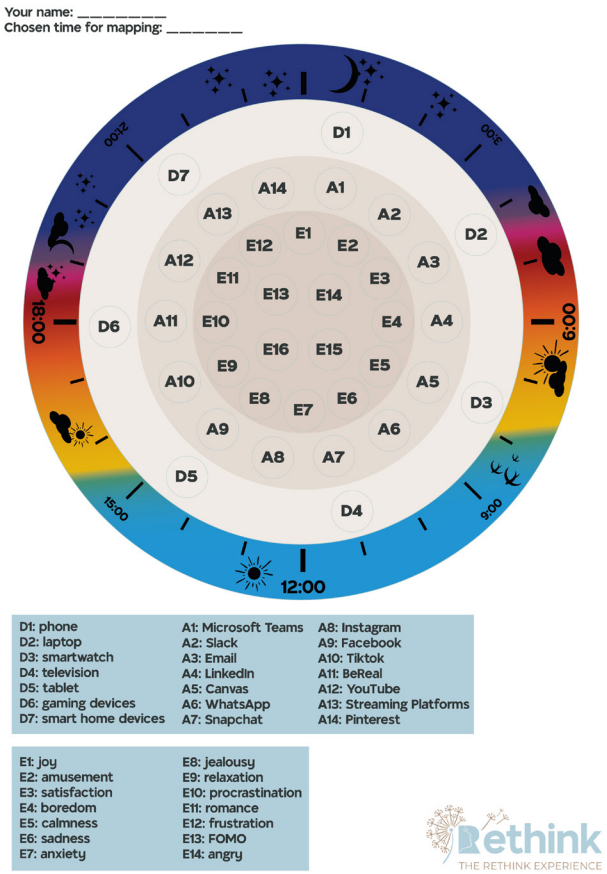


Figure 4.30 - Data acquisition

Figure 4.31 - Demoday setup

5. User Research

In the design process, data gathered from user research played an important role as the creative material to explore and inform design decisions. In total, five user studies were conducted, with three for investigating user needs and two for testing the experience design prototypes. This chapter highlights the main findings from every study, while a complete overview can be found in Appendix E.

User Study 01: Initial Survey (Iteration 02)

This survey was done in Iteration 02 to gain insights about the behaviours of using digital devices. Participants (N=33) were found through convenience sampling, where most of them are Industrial Design students. This research showed that participants interact with multiple digital devices daily. However, they had a hard time defining their digital space and knowing how to improve. This led to an important change in design direction: from intervention product design to creating an experience design for mapping both current and ideal digital space.

User Study 02: First Experience Design Usability/UX Testing (Iteration 03)

A small-scale experience design prototype was created in Iteration 03. The goal was to investigate how a physical mapping tool could create an experience to trigger reflections about the presence of digital space. Participants (N=8, studying Industrial Design), mapped both current and ideal spaces. Overall, participants found it fun and helpful to reflect what they truly valued through tangible interactions. Moreover, it was noticed that current digital space contained negative elements, whereas future digital space was mostly associated with positive feelings. Furthermore, the prototype could be improved: bigger elements; having two sets, one for current, one for ideal digital space. Eventually, this user research validated the experience design approach as the design direction, with tangible mappings of digital space could enable critical reflections.

Figure 5.1 - Wordcloud analysis of user study 02 results

5. User Research

User Study 03: User co-creation Session (Iteration 04)

The user co-creation session (Figure 5.2-5.3) was hosted by two researchers with participants (N=7, studying Industrial Design) in three groups, at the start of Iteration 04. It was aimed to identify frictions and co-create solutions in three parts of a day: morning, afternoon, and evening. A thematic analysis was performed (Figure 5.4-5.5), which concluded the most significant friction: connectedness. Industrial Design students are always connected through digital technologies for university study, work, and leisure. This friction guided the design process in Iteration 04 to the final concept.

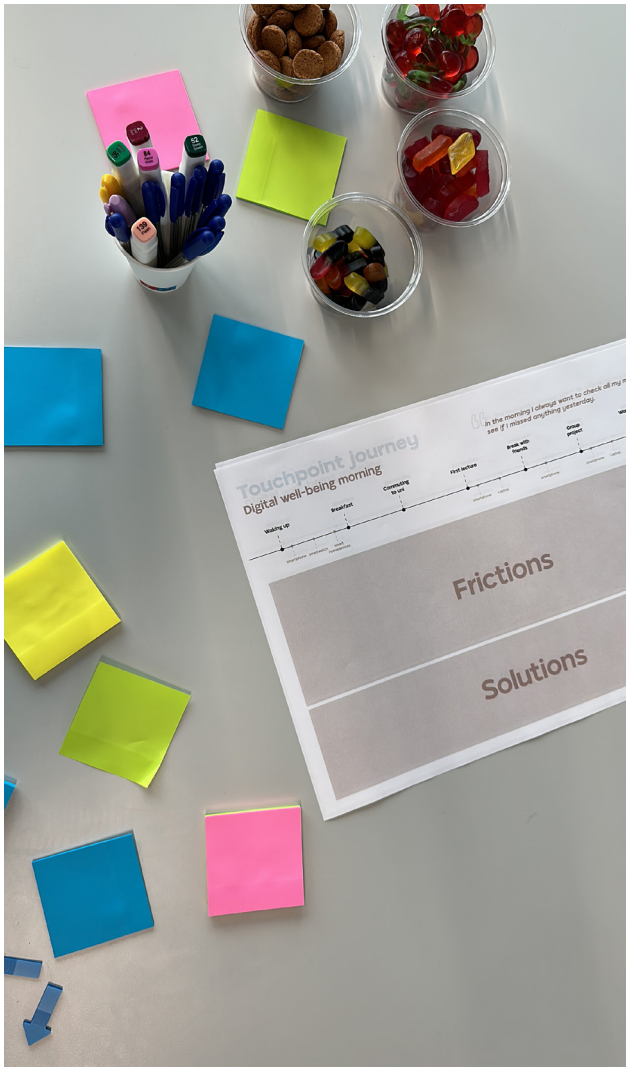


Figure 5.2 - Structure co-creation including touchpoint timeline of morning, afternoon and evening

Figure 5.3 - Co-creation with users

5. User Research

Frictions

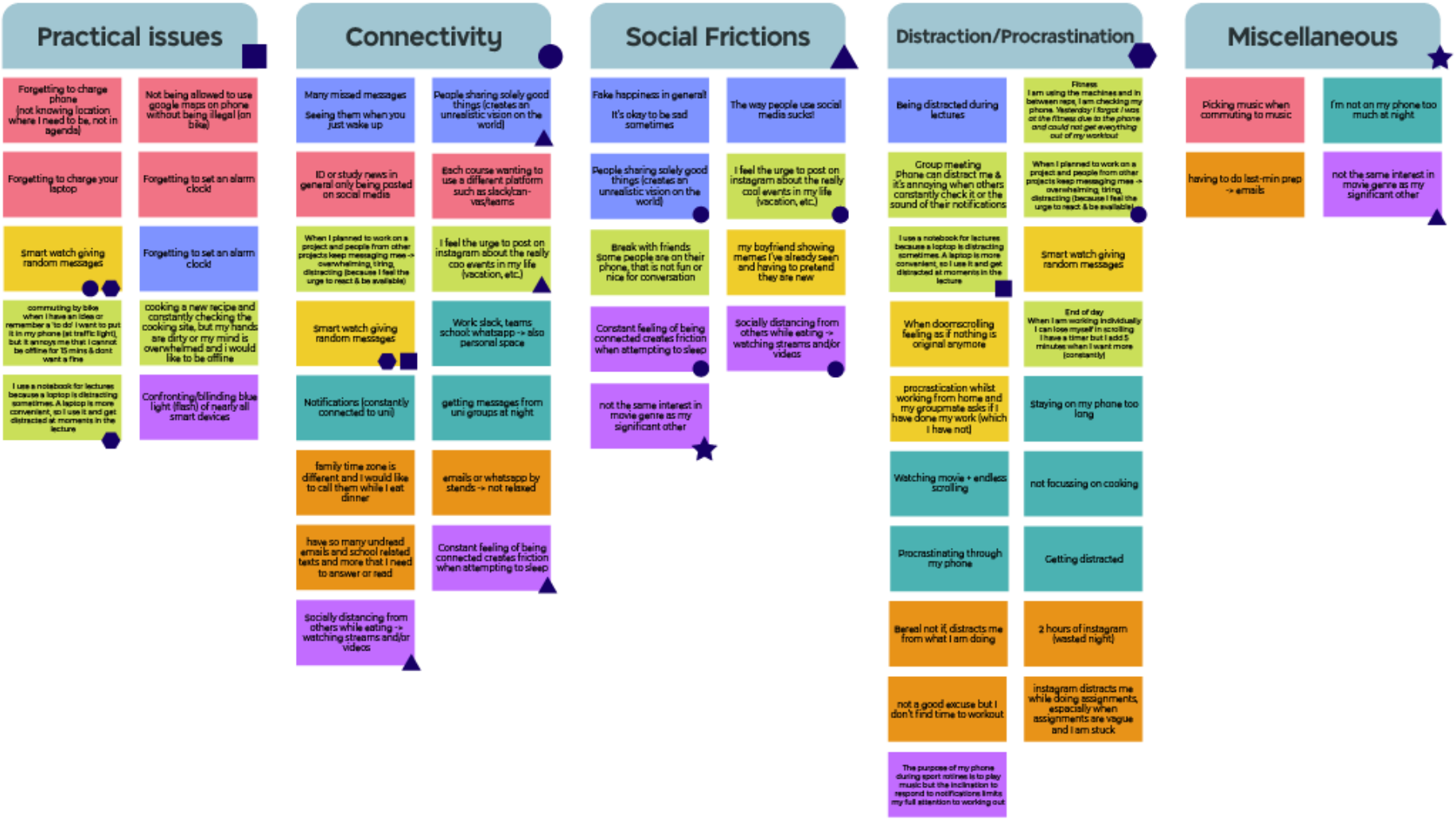


Figure 5.4 - Frictions from co-creation

5. User Research

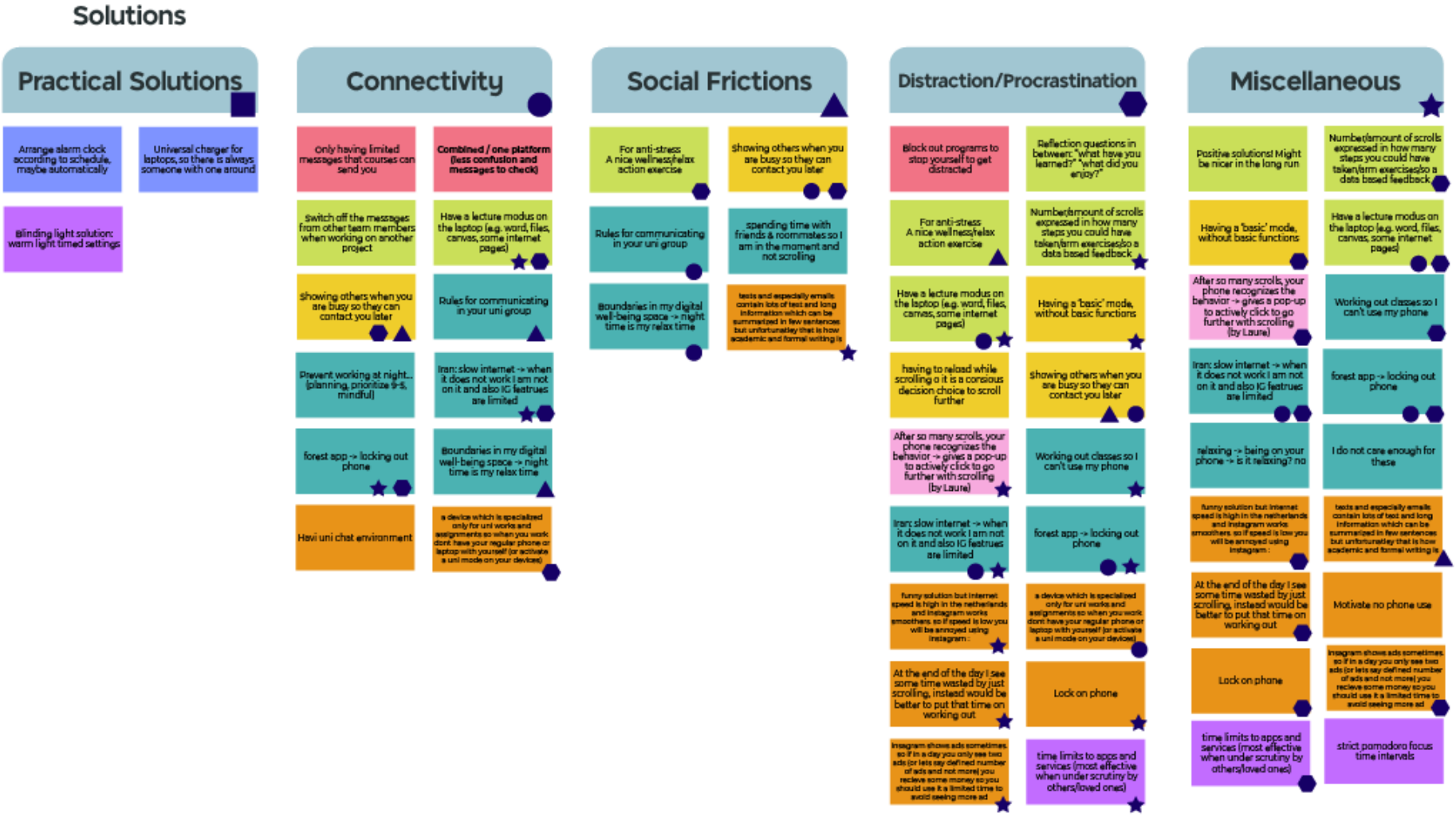


Figure 5.5 - Solutions from co-creation

5. User Research

Simultaneously, diary studies were performed next to user co-creation with Industrial Design students (N=20) over one week. The study included both weekdays and weekends, where participants filled in a daily survey. An initial and final survey were created to monitor the differences. Carrying out a thematic analysis with a mixed method approach, it was found that smartphone and laptop were the two dominant devices. Participants associated with these devices for both study/work and leisure, but with different applications. In addition, it was obtained that participants had a variety of emotions associated with digital space. The devices, applications, and emotions, with the descriptions of their days, were translated into design choices of the prototype elements for the demoday design.

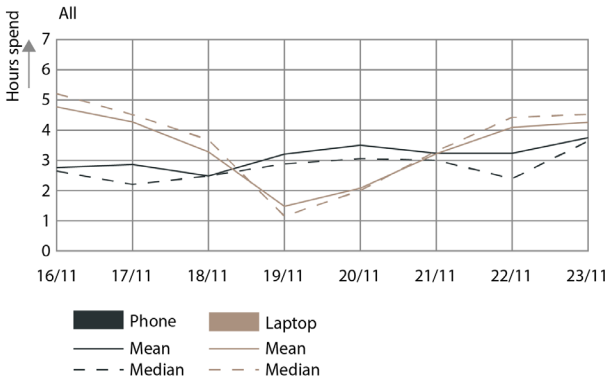


Figure 5.6 - Diary study results

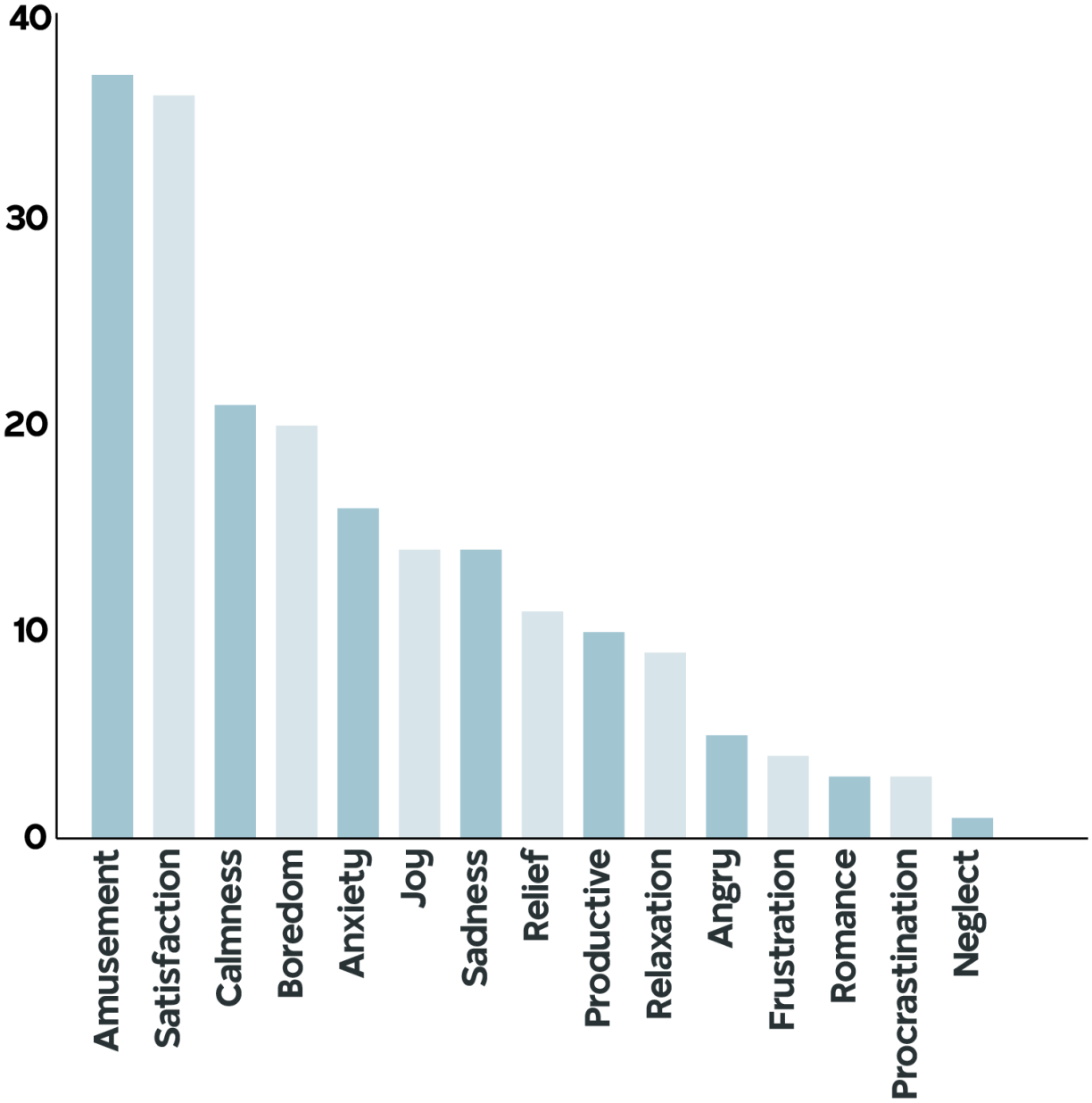


Figure 5.7 - Emotions from diary study

5. User Research

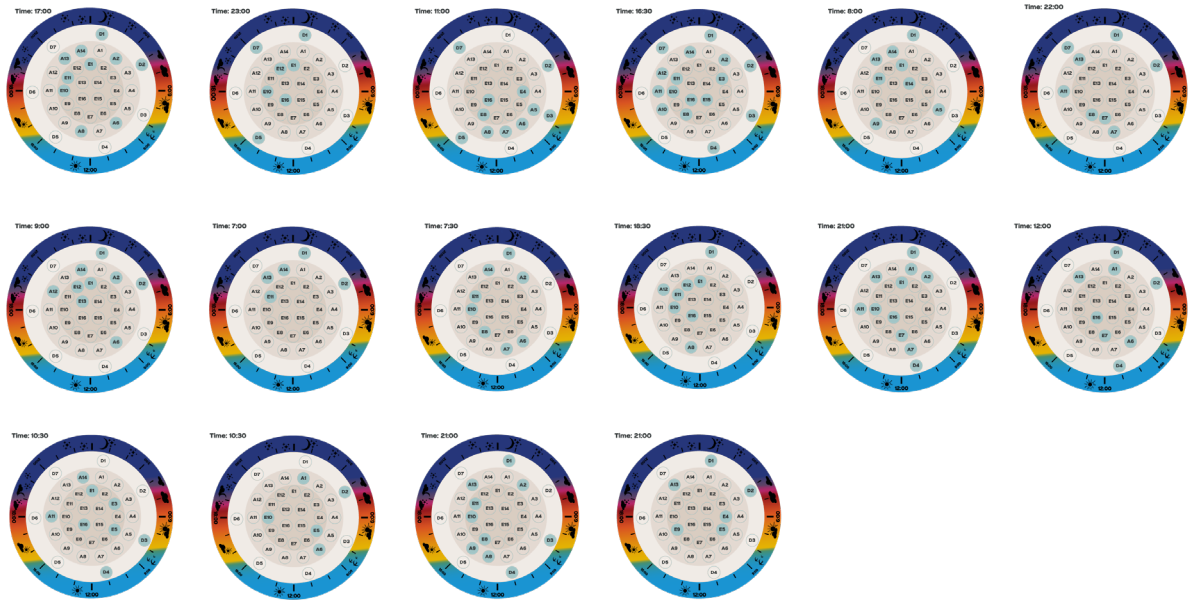
User Study 05: Experience Design Usability/UX Testing

The Rethink prototype, together with the first iteration of Aftercare, was tested with the target group on the demoday. To evaluate the usability and user experience of Rethink, the ideal testing setting would be at an exhibition. Since it offered a similar setting as the ideal scenario required for this user study, it was decided to take demoday as an opportunity for this user research and validation of the design. Convenience and snowball samplings were done. Participants (N=16, studying industrial design) were asked to interact with the prototype, while researchers documented their choices on a data acquisition sheet and took observational notes. Afterwards, short interviews or a short feedback survey were conducted with participants to collect insights.

Most participants expressed the prototype being helpful to draw reflections with a positive experience. One participant commented “Seeing the design already helps in reflecting.” In addition, the data overview (Figure 5.8) proved that digital space is very personalised. However, there were some points of feedback received. First, the experience was not very intuitive. This was probably caused by the limitations of technological realisation and the space available, addressed in Discussion.

In addition, web applications and a layer of physical activities could be included in the Rethink prototype, to trigger reflections on how digital space is present compared to the physical interactions. Participants also suggested including physical activities for the Aftercare, which corresponding improvements were made for the final concept (Figure 6.9).

Overall, this user study provided a clear and good indication which validates the design of the Rethink Experience to be helpful in drawing reflections in an exhibition setting but also identified some areas of improvement. The Aftercare encourages the participants to actively reflect and work on their digital well-being after the Rethink Experience which was received very well. The feedback points were then used for the last iteration presented in the Final Design chapter.



D1: phone	A1: BeReal	A8: YouTube
D2: laptop	A2: WhatsApp	A9: Facebook
D3: tablet	A3: Pinterest	A10: Slack
D4: smart home devices	A4: Tiktok	A11: Streaming Platforms
D5: gaming devices	A5: LinkedIn	A12: Microsoft Teams
D6: smartwatch	A6: Canvas	A13: Instagram
D7: television	A7: Snapchat	A14: Email

E1: relaxation	E9: sadness
E2: angry	E10: amusement
E3: frustration	E11: procrastination
E4: anxiety	E12: satisfaction
E5: jealousy	E13: envy
E6: romance	E14: FOMO
E7: calmness	E15: relief
E8: boredom	E16: joy

Figure 5.8 - Demoday design user testing

6. Final Design

Within this chapter we are presenting the final design of: the Rethink Experience. Rethink consists of a tangible, interactive experience design as well as an post-experience aftercare system. Its aim is to create a deeper level of awareness through facilitating critical reflection on your personal digital well-being and digital space. Rethink achieves this by letting users interact with the design in a free open space where they are able to create a visual representation of their digital space within the design after which they will receive the personalised aftercare package. This chapter elaborates upon all the different elements that the final iteration (e.g. final design), which was created from the demoday prototype iteration and the user test results/ feedback from demoday, consists of and how it all fits together in the bigger picture to create value for our target group (or also described as the user in this chapter).

Who, where and what?

Rethink was created to help our target group, Industrial Design students, with critical reflection on their digital well-being in order to enable a deeper level of awareness. Industrial Design students commonly and frequently use multi- or mixed media in their daily lives. Their work, study and leisure often all make use of the devices and technologies around us, making it hard for them to disconnect from devices and technologies in general. This results in a big and complicated digital space and thus well-being where there is no holy solution to balance it all.

Our user studies confirm this, showing that awareness was indeed lacking within Industrial Design students which is addressed within the design of Rethink.

Rethink is designed for an exhibition-like setting, as shown in Figure 6.2. In order to facilitate access to the design for our target group, we envision a place like the ground floor of the Atlas building on the TU/e campus to be a good example of such a place. Here the target group frequently passes by, and is provided with the opportunity to interact with Rethink through easy access. Similar locations can be found in buildings that house ID students at other universities in the Netherlands or worldwide. The goal of Rethink existing in this open space is to encourage people to stop and reflect but without pressuring them to participate. We believe that their curiosity might allow them to come closer and start interacting with it and without an open and accessible space, that is most likely to not happen.

The last column in Figure 6.2 refers to the benefits of participating and completing the Rethink Experience. It is about all of the value that it could have to the target group post-interaction. It is mostly centred around a deeper level of awareness but also shares potential value for a healthier digital well-being through taking actionable steps from the aftercare system. Rethink does not aim to enable behaviour change but supports our target group if they wish to do so after completing the experience.

The experience itself focuses on creating a deeper level of awareness through critical reflection through tangible interaction whereas the aftercare system supports users' post-experience.

Figure 6.1 - User interacting with design

6. Final Design

Rethink
THE RETHINK EXPERIENCE

setting and environment	target group	benefits and values of using
open space	*ID students*	*(deeper level of) awareness on personal digital well-being*
in ID buildings on campusses	*worldwide*	*understand what digital well-being is and how it looks like*
freely available and accessable	*Ages: 18-28*	*able to achieve healthier balance between the digital and physical world*
	who use multimedia for work & leisure	*understand how digital well-being and digital space are connected to their lives*
		able to reflect on own behavior in relation to digital devices
		able to have a healthier relationship with the digital world & devices
		able to take actions to achieve healthier digital space

Figure 6.2 - Rethink setting, target group and value

6. Final Design

The Aftercare System

As mentioned before, the Rethink Experience aims to create a deeper level of awareness through critical reflection and even though we are not aiming for behaviour change, we have created an Aftercare system to help the user post-experience with their digital well-being. The goal of this system is to provide support and guidance on how to improve digital well-being through actionable tips and recommended products/services which addresses a need expressed by participants from the user studies (e.g. demoday testing).

How exactly the after care system works, is visualised in Figure 6.3. The personal data from interaction with the prototype is gathered and analysed after which it is sent through in summary form to the user. This will be done through email, which the email address is provided by them with a touchscreen device next to the prototype. What is sent in this email can be seen in Figure 6.7. In short, it includes an overview of the data, personalised tips based on input data and recommended products/services that fit their digital space and potential needs. Through the examination of this data and reflection on personal habits and behaviours, individuals are able to gain a deeper understanding of their relationship with technology and identify areas where changes might be necessary.

This system provides ongoing support and resources in order to empower individuals to continue their journey towards digital well-being even way after their experience with Rethink. They can use the data overview and personalised tips to improve their digital well-being if desired to make use of this ongoing support system. Ongoing support is a vital aspect of creating an effective experience that can lead to lasting change in digital well-being. Users can come back to Rethink and re-evaluate their digital well-being at any time. Their personalised after care system is then changed based on their new and improved digital space. In this way, users can get even more ongoing support from Rethink if they are really interested in pursuing a better digital well-being.

The Data

If the user decides to sign up for the after care system they receive the following things based on their inputted data: an overview of their data in a visualisation, personalised tips and tricks to create a healthier digital well-being and suggestions for products/services to potentially try out. Through the examination of this data and reflection on personal habits and behaviours, users are able to gain a deeper understanding of their relationship with technology and identify areas where changes might be necessary. It was found that this personal analysis is a crucial step for improving digital well-being, as it allows individuals to see the impact of their technology usage and make informed decisions about how to use technology in a balanced and healthy manner which is why it is included in this final iteration of the aftercare system.

Figure 6.3 - Aftercare process

6. Final Design

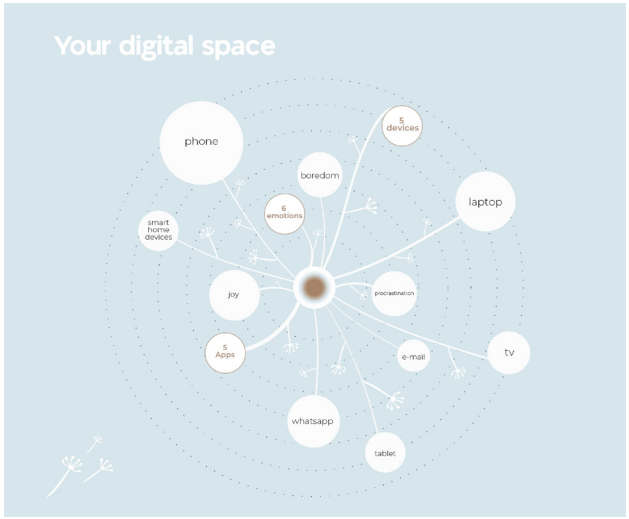


Figure 6.4 - Digital space overview

Figure 6.5 - Aftercare

6. Final Design

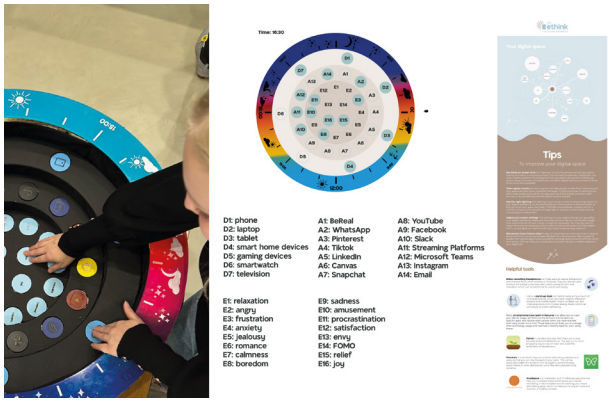


Figure 6.6 - Demoday user input gets translated into overview

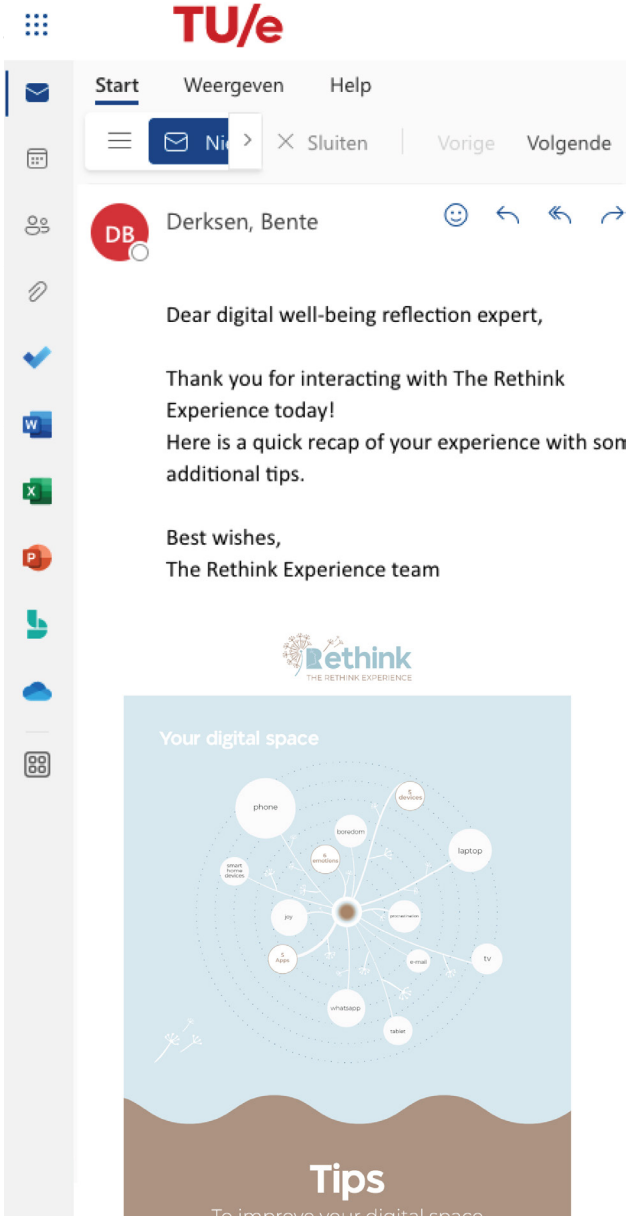


Figure 6.7 - User receives e-mail

Figure 6.8 - Aftercare

6. Final Design

The Bigger Picture

Within this project and whilst designing Rethink we not only looked at enhancing the experience itself but also how it fits into the bigger, overall picture surrounding it. This section elaborates upon this bigger picture through personas, an 'experience to design story', a user journey, and a storyboard.

Persona

Two personas were created for the Rethink Experience, through analysing the demographic and behavioural segmentation (Lotame, 2023). The first persona (Figure 6.9), Sophia is an Industrial Design student. It was created based on the analysis of all the user research. The Rethink Experience could be beneficial for Sophia to draw meaningful reflections. Due to the limitations in user and literature studies, there is not enough evidence for creating more personas for other demographic and behavioural segmentation. Instead, a non-user persona (Figure 6.10) was built as a young child, based on researchers' previous knowledge and observations in everyday life. This is used for providing an example as to how the Rethink Experience could be experienced in a different way. It is worthwhile to note that the non-user persona needs to be proved by testing how children understand and interact with the Rethink prototype, as part of the future work.

The Rethink Story

To create a truly impactful experience, it is important to think beyond the design, as to look at how it fits into the everyday life of the target user, namely Industrial Design students, and to tell the design story.

Extensive user research was conducted iteratively in the design process with several methods, including co-creations, diary studies, and usability testing of designs with the target group. The research findings were used for exploratory design activities, while providing a strong basis for the journey of the Rethink experience and the impacts of the experience in the everyday life of the user.

The Rethink story (Figure 6.11) was then created to show three stages: before, during, and after the Rethink Experience. The 'before' stage mainly focuses on the everyday story of a typical user; the 'during' stage presents the Rethink Experience, with a series of actions; and the 'after' stage highlights the implementation of the Rethink Aftercare in everyday life.

User (/ Customer) Journey

With a data-enabled approach, and based on the results from user research (especially co-creation and diary studies), two user (/customer) journeys were mapped. The first one focused on the Rethink Experience (Figure 6.12). It specifies the actions that a user performs over the entire experience and with touch points of the design. The other one (Figure 6.13), looks at the impact that the Rethink Experience has in the user's / customer's digital space of everyday life. By looking at the journey both before and after the Rethink Experience, the impact it has on everyday life was assessed. For both graphs, the emotion changes were mapped, and user needs and pains were highlighted in every user journey step.

The Storyboard

With the mapping of the Rethink Story and user (/customer) journey, it was concluded that a visual representation of the process could be a meaningful addition to demonstrate the entire story around the Rethink Experience. A fictional character was used to narrate the story (Figure 6.16).

6. Final Design

Sophia van den Berg

Photo by Abbat on Unsplash

Age: 21 years old
Education: Bachelor's Degree
Major: Industrial Design
User segment: **typical user**

PROFILE

Personalities: open-minded, empathetic, adaptable
Technology-savvy skills: graphic designs, modelling, social media
Hobbies: reading, photography, travelling
Digital devices owned/used everyday: smartphone, laptop, tablet
3 most frequent used applications for work/study: Fusion360, Microsoft Teams, Adobe Illustrator
3 most frequent used applications for leisure: WhatsApp, Instagram, Snapchat

ATTRIBUTES

Average work/study time with digital technologies on a weekday:
0 hour — 10 hours

Average leisure time with digital technologies on a weekday:
0 hour — 10 hours

Average work/study time with digital technologies on a weekend:
0 hour — 10 hours

Average leisure time with digital technologies on a weekend:
0 hour — 10 hours

THE STORY OF Sophia

Every morning, Sophia is waken up by her alarm clock. She always sets the alarm a bit earlier, so she can scroll over her social media on her phone before getting out of her bed. After the breakfast, Sophia goes to the university. She often starts with a lecture or a meeting, where she uses her laptop for taking notes. During lunch, she updates and messages her friends on her phone. In the afternoon, she studies in the library for a few hours. She uses her laptop and tries to stay away from her phone, but sometimes she gets distracted. After dinner, she takes time off by watching movies/series or reading a book on a tablet, while multi-tasking as checking social media updates on her phone. She sees the Rethink design on a design site. She finds interesting as she always finds hard to create a good physical and digital balance. The next day, Sophia visits the exhibition and interacts with the Rethink prototype. She finds helpful to draw deep reflections by mapping the digital space physically. She gets a personalised Aftercare through email. By implementing the tips, Sophia now has better control over her digital interactions.

Rethink
THE RETHINK EXPERIENCE

GOALS FOR DIGITAL WELL-BEING

- Understands the current behaviours
- Draws meaningful reflections
- Receives tips for improvements

MOTIVATIONS FOR THE RETHINK EXPERIENCE

- Has a physical mapping experience
- Gets insights for her digital well-being
- Wants to improve her digital well-being

VALUES RETREIVED FROM THE RETHINK EXPERIENCE

- Well-being
- Personal growth
- Support

"THE RETHINK EXPERIENCE HELPS ME TO REFLECT ON MY DIGITAL SPACE FOR BOTH STUDY AND LEISURE."

Figure 6.9 - Persona 1

6. Final Design

Laura van Kollenberg

Photo by Senjuti Kundu on Unsplash

Age: 4 years old
Education: Pre-school
User segment: **non-user**

PROFILE

Personalities: active, creative, open
Technology-savvy skills: -
Hobbies: drawing, playing outdoor, listening to stories
Digital devices owned/used everyday: tablet
3 most frequent used applications for work/study:
Lingokids, IXL, Duolingo Math, Duolingo
3 most frequent used applications for leisure:
Barbie Dreamhouse Adventure, Simply Piano, YouTube Kids

ATTRIBUTES

Average work/study time with digital technologies on a weekday:
0 hour — 10 hours

Average leisure time with digital technologies on a weekday:
0 hour — 10 hours

Average work/study time with digital technologies on a weekend:
0 hour — 10 hours

Average leisure time with digital technologies on a weekend:
0 hour — 10 hours

THE STORY OF LAURA

A typical day for Laura starts with waking up by her mum and going to the pre-school. After coming back home, she takes the tablet to learn the language and Maths for about 20 minutes. Afterwards, Laura likes to check out new videos from YouTube Kids. She laughs and enjoys, but her mum takes good control of her screen time, so she enjoys drawing and playing outdoor more. On a Saturday, Laura visited an exhibition together with her parents. She got attracted by the colourful prototype of the Rethink Experience. She was curious, and she had fun with the playful interactions. However, she does not understand the purpose of the design, and could not draw critical reflections on digital well-being as she is too small. She remembers the Rethink Experience well, and asks her parents to bring her there a few weeks afterwards.

Rethink
THE RETHINK EXPERIENCE

GOALS FOR DIGITAL WELL-BEING

- Knows what is possible with digital technologies
- Learns how to connect with friends digitally

MOTIVATIONS FOR THE RETHINK EXPERIENCE

- Playful interactions
- Attractive colours
- Curious what it is

VALUES RETREIVED FROM THE RETHINK EXPERIENCE

- Creativity
- Excitement
- Fun

"THE RETHINK EXPERIENCE IS PLAYFUL. I WANT TO HAVE IT AS A TOY."

Figure 6.10 - Persona 2

6. Final Design

Experience design to story

To create a truly impactful experience, it is important to think beyond the design, as to look at how it fits into the everyday life of the target user, namely Industrial Design students, and to tell the design story.

Extensive user research was conducted iteratively in the design process with several methods, including co-creations, diary studies, and usability testing of designs with the target group. The research findings were used for exploratory design activities, while providing a strong basis for the journey of the Rethink experience and the impacts of the experience in the everyday life of the user, as presented below:

The Rethink Experience

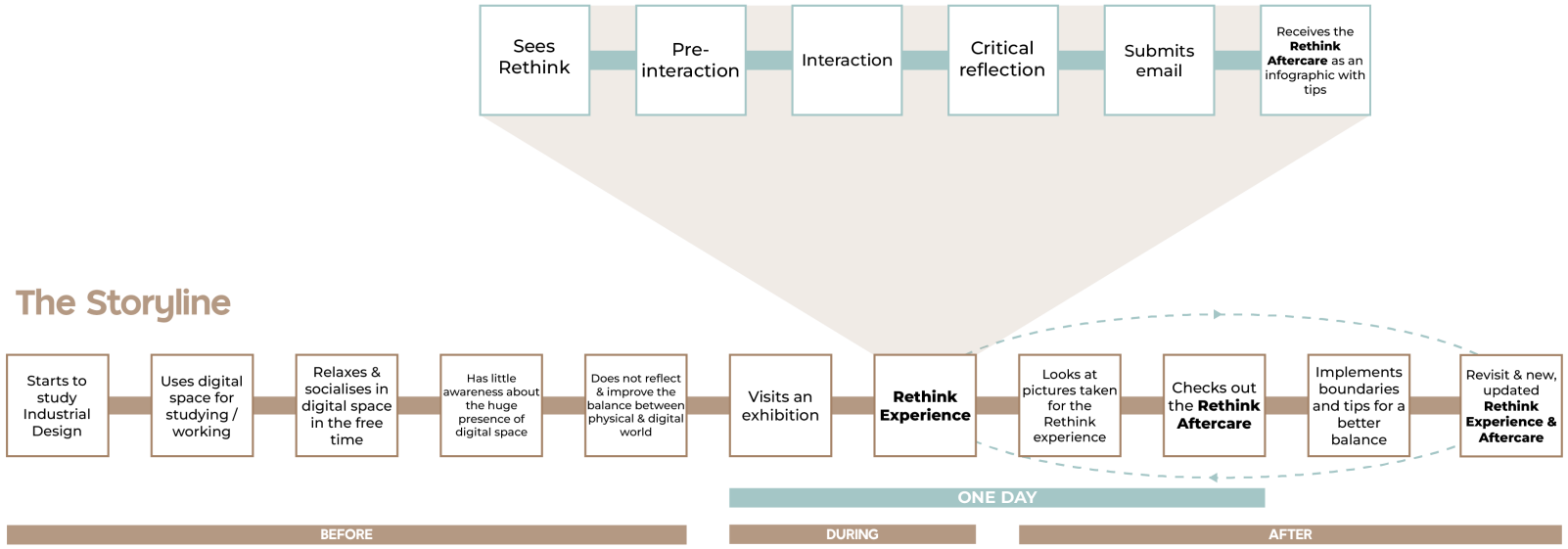


Figure 6.11 - Experience to Design Story

6. Final Design

USER (/CUSTOMER) JOURNEY WITH DIGITAL SPACE

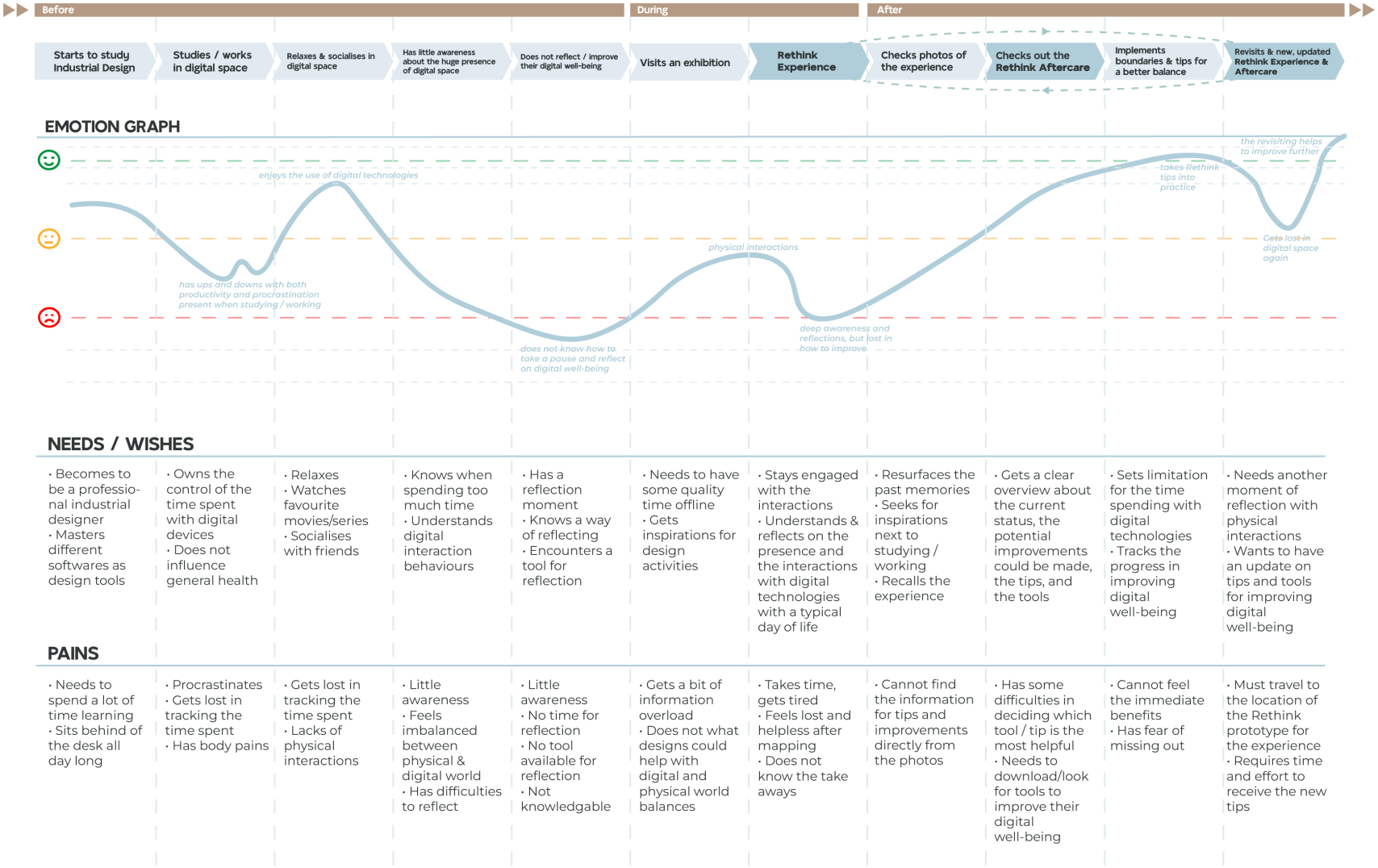


Figure 6.12 - Rethink User Journey

6. Final Design

USER (/CUSTOMER) JOURNEY OF THE RETHINK EXPERIENCE

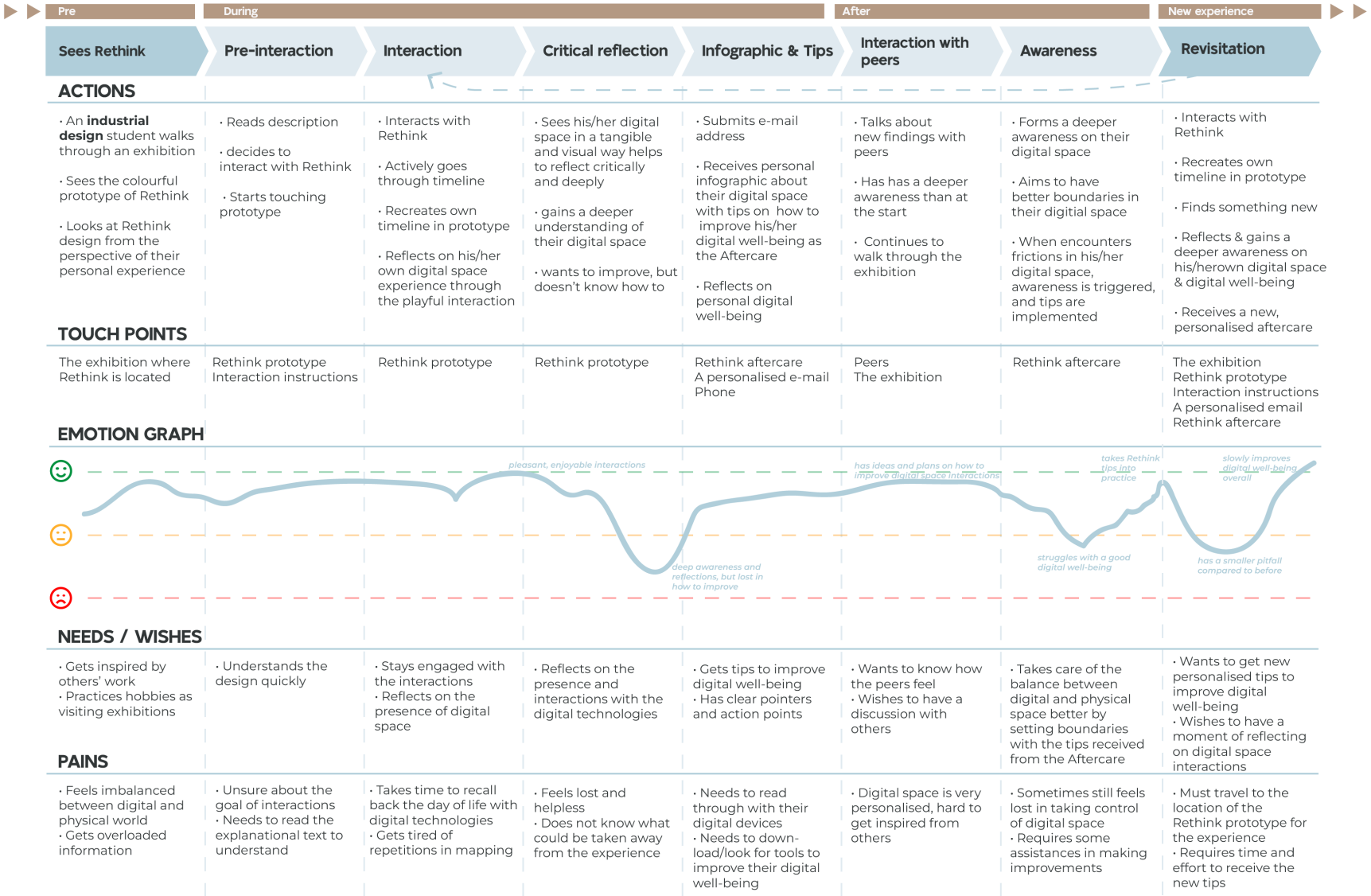


Figure 6.13 - Rethink User Journey part two

6. Final Design

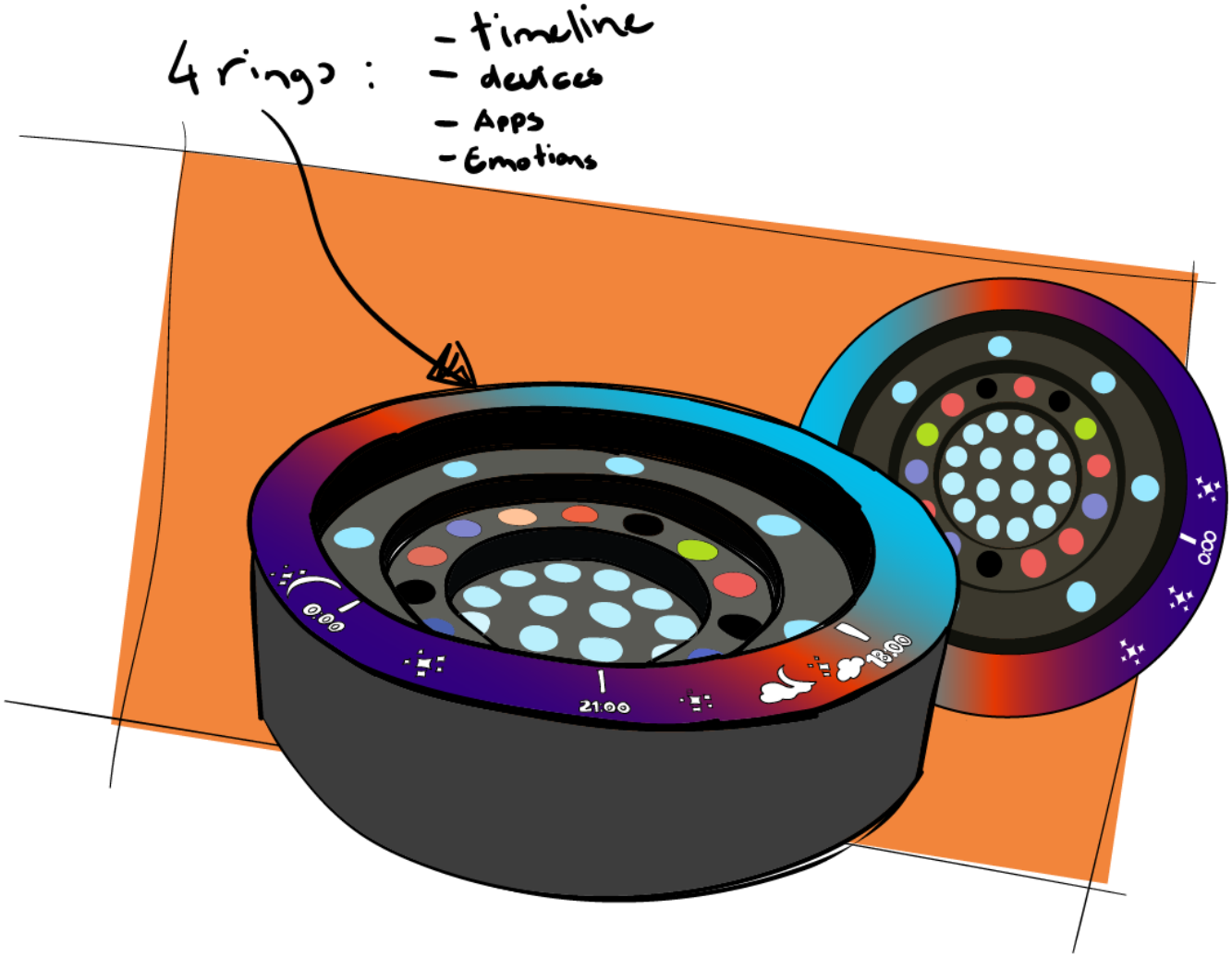


Figure 6.14 - Sketch final design

Figure 6.15 - Final prototype

6. Final Design

Figure 6.16 - Full Storyboard of Rethink

6. Final Design

Business Propositions

Throughout the design process and towards the end throughout the project, we reflected upon the business considerations within this project to help create a better understanding of the value we are creating for users (e.g. our target group) with Rethink. We did this in two different ways; branding and business mappings which is elaborated upon below.

Branding

Rethink also features a fully developed branding kit. We aimed to create the entire look-and-feel people experience whilst interacting with the design and brand in order to promote a feeling of familiarity and intuitiveness amongst all the parts of Rethink, whether that was the tangible design or the aftercare system. A typical branding process was done in order to create these graphic assets, starting with the goal section where the micro and macro goals were identified (put reference to figure here). This not only helped communicate clearly what was all part of Rethink but also helped translate our vision of Rethink to our target group.

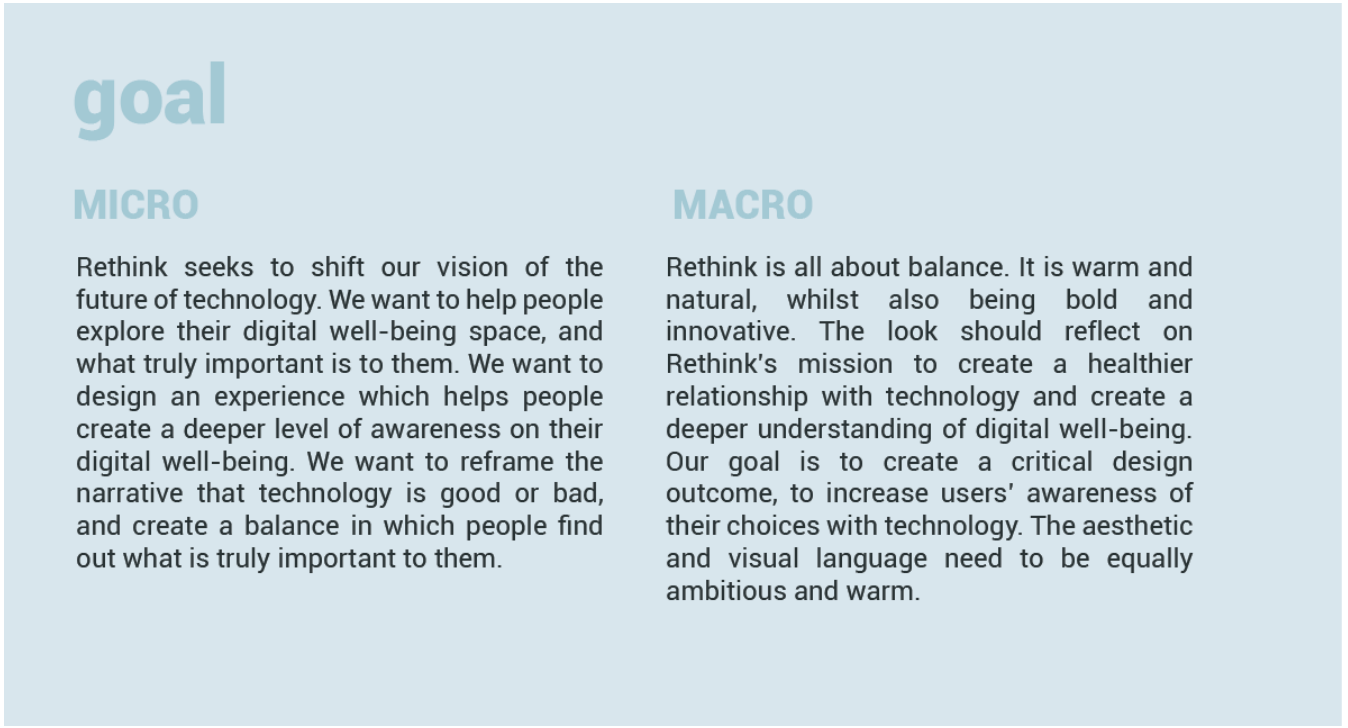


Figure 6.17- Branding goals

6. Final Design

#1B1C1E #DAE6E6 #A4C6C6 #A48266 #F6F4F2

Headers: TangoSans

Body: Montserrat

Figure 6.18 - Branding elements

6. Final Design

Business Mappings

Both a value proposition canvas (Pokorná et al., 2015) and a problem-solution-fit canvas (Nepriakhina, 2019) were used as tools to validate our design as well as to get a good overview of what value we offer to users. Rethink is not designed to be a commercial solution but merely an experience for ID students, our goal with these canvasses is to further identify their positioning in the current market- and design landscape. Therefore, these canvases are filled in using the data from our user research, and offer us a visual representation of what we have to offer them showing what currently works and what can be improved upon in the future which is included in this chapter as well as the discussion and conclusion.

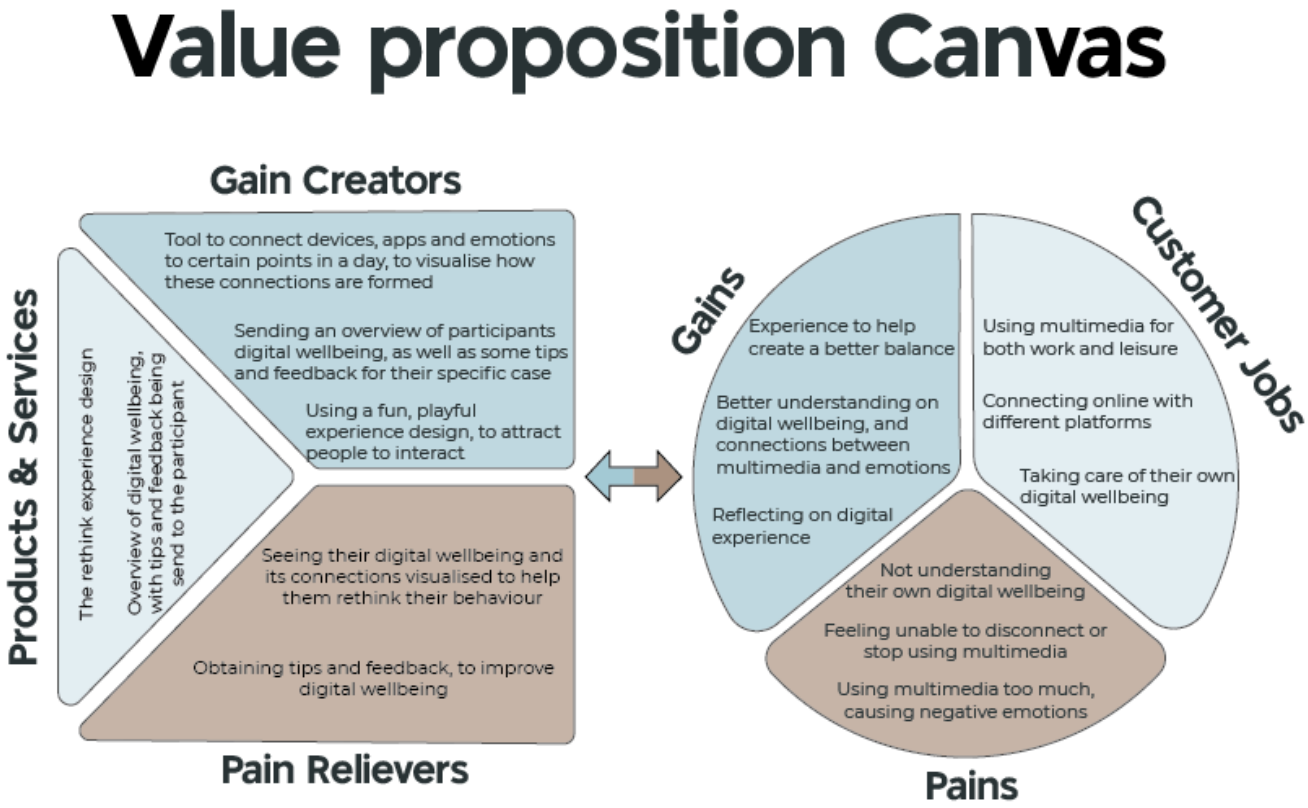


Figure 6.19 - Value proposition canvas

6. Final Design

Problem-Solution Fit CANVAS

M1.1 Rethink

1. CUSTOMER SEGMENT(S) CS

Using multimedia for both work and leisure
Taking care of themselves and their work
Being connected online

6. CUSTOMER LIMITATIONS EG> BUDGET, DEVICES CL

Time
Having to use multimedia for work

5. AVAILABLE SOLUTIONS PROS & CONS AS

Digital Detox apps works decently well in lessening usage, however, it is counter intuitive
Shutting out multimedia as a whole unpractical or even impossible for work
Rehabilitation helps with detoxing, however is too intense for a lot of people

2. PROMBLEMS/PAINS +ITS FREQUENCY PR

Having negative emotions from technology usage	Weekly
Feeling like it's unavoidable to use multimedia for work	Weekly
Not understanding digital wellbeing	Daily
Not knowing connections of emotions and multimedia	Often

9. PROBLEM ROOT / CAUSE RC

Using multimedia for too long and not understanding how this affects them
Not seeing alternatives to multimedia because they are used to use this
Not seeing directly how their digital behavious affects their emotional state
Complexity of devices, applications and emotions makes it difficult to understand

7. BEHAVIOR +ITS INTENSITY BE

Feeling not well, and spiralling back to multimedia to distract	medium annoyed
continuing this spiral of multimedia addiction	Seemless but intense
Ignoring the problems with digital wellbeing	Seemless but counts up
Accepting that they don't understand it	mildly annoying

3. TRIGGERS TO ACT TR

Experience design at exhibition
Feeling so bad that they shut out apps or devices

4. EMOTIONS +BEFORE/AFTER EM

Not understanding their own digital well-being and emotions their experience. Before

Understanding connections between emotions, devices and applications After

10. YOUR SOLUTION SL

An experience design that helps you reflect on your digital wellbeing, by visualising the connections between your digital devices usage, apps usage, and the emotions you experience with that. Additionately, we offer personalised tips and feedback to help and better their digital wellbeing

8. CHANNELS of BEHAVIOR CH

ONLINE

Personalized tips and feedback by email
Tech innovation websites

OFFLINE

Interaction with design at exhibition
Mouth-to-mouth adversising

Figure 6.20- Problem-Solution fit canvas

7. Ethical Considerations

Ethics are important for both research and design. Therefore, this ethical analysis focuses on these two areas: user research and technological footprint.

The overall protocols used were assessed with six potential ethical issues identified by Bhandari (2021). The six areas are voluntary participation, informed consent, anonymity, confidentiality, potential for harm, and results communication. For every user study, the first five aspects were guaranteed, with approved Ethical Review Forms (Appendix F.3). Results communication was indirectly considered: participants could document their inputs by taking photos. Future work could ensure participants have a digital copy of their data. For the elaborated analysis of the six dimensions, see Appendix F.1.

In addition, the technological footprint was assessed with eight areas of impact based on the squad workshop materials (Appendix F.2). They are body, mind, self-perception, behaviours/habits, values & beliefs, relationships, cultural identity, and societal structures. Through the initial evaluation (Step 1), it was found that 'societal structures' did not apply to the Rethink Experience. Henwce, it was chosen to continue with the rest of the areas.

The assessment was executed based on the final design, described in Chapter 6. It is worthwhile to mention two notes methodology-wise. First, if the question includes an if-statement, and if the statement does not apply to the design, it is considered the statement to be neutral. Additionally, the analysis was done by one team member, which might result in biases. In the future, multiple people could collaborate and discuss the differences. The result of the analysis as the overall tech footprint is presented in Figure 7.1.

Overall, the mean scores for all the areas are above 3.5 out of five, while three means neutral, and five means strongly positive. Therefore, it could be concluded that the Rethink Experience has a positive impact on the technological footprint, with the consideration of seven impact areas.

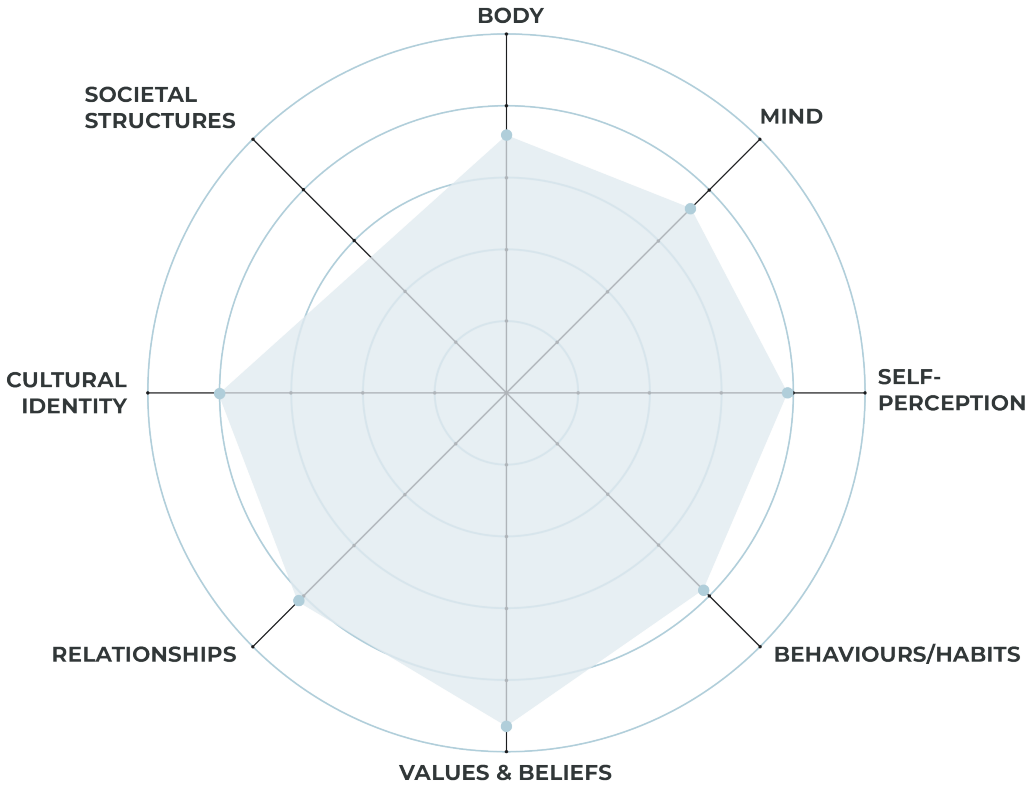


Figure 7.1 - Ethical analysis of The Rethink Experience

8. Discussion

Interpretation of Results

Overall, the design process of the Rethink project was highly iterative, with the interweaving between research and design. Throughout the project, design iterations were driven by data-enabled design, with user-centred research including literature, benchmark, and four user studies. They led to the prototype presented at the demo day.
The final validation took place during the final demo day, which provided valuable insights into the strengths and limitations of the concept. The results showed the concept promising for further developments. With the feedback received, some advancements were made to the demoday concept (see Design Process Chapter), which led to the final design of The Rethink Experience (see Final Design Chapter). The advancements include the creation of personas, storyboard, and the updates of user journey, experience design to story, and the Rethink Aftercare.

Limitations

Technological limitations

Adapting a Wizard of Oz approach, the demonstrator was able to be evaluated by the target group for reflecting on their digital spaces. However, the programmed timeline based on the user research data could only be presented in a series with time intervals. It would be ideal that the data is presented corresponding to the time chosen by the user, through turning the timeline ring. To reach so, the Bluetooth module needed to communicate the accelerometer data, representing the chosen time based on measuring the movements, to output modalities as the corresponding LED lights turning on or off. Potential causes could be broken soldering, pins soldered were perhaps too close together and becoming connected resulting in a short circuit, and no sufficient power supply.
In addition, the Rethink Experience system itself does not collect data. To fully realise the experience, an effective way of attaching buttons should be explored and included. It is also needed to include a WiFi module and a program to upload the data to a protected Application Programming Interface (API) with a personal access token. Users could then retrieve their data from the API, through for example, a design and development of an application.

Concept Limitations

The Rethink Experience focuses on addressing the need of awareness and the difficulty in reflecting on digital well-being. However, the challenge of balancing the digital ánd physical world was not taken into account. While the Rethink Experience primarily focuses on the digital space, the final user test showed the importance to consider the physical activities next to digital interactions. This balance could be explored in future iterations, to provide a more comprehensive solution to promote digital well-being.

User Research, Target Group And Context Limitations

All the user research was performed with participants studying Industrial Design at Eindhoven University of Technology. This was due to the limitations in accessing resources and time availability. However, the final user research showed potential to be opened up to a wider audience. It could include students in general, office workers, and even individuals who have a digital space in their daily life. The Rethink Experience could be explored further, as a public-space, social design. For example, it could be deployed at the ground floor of Atlas or at the train station for even bigger audience groups.

Design Process Limitations

Due to the broad scope offered by the project brief, the defining process may have limited design activities and technological realisation. Nevertheless, an interweaving process with both design and research activities were performed. Initial ideations, sketches, and physical explorations were performed in the first three iterations along researching. More hands-on explorations were incorporated in Iteration 4. Combined with both research findings and design explorations, it led to the demoday prototype and the final design. It is worthwhile to mention that the duration of the project was over two quartiles, with the double distributed time slots for the second quartile compared to Quartile 1. Therefore, the end of Quartile 1 only marked one-third of the design process.

8. Discussion

Future Work

First, a fully functional, experienceable prototype could be developed. This could lead to a new and bigger user study to examine the usability and the user experience, with a bigger target group (as the general public) and with in-situ deployments.

In addition, the Aftercare, which provides personalised tips and guidance for digital well-being, has shown the potential for ongoing personal growth and development. Future improvement could be creating a workbook as a guide to accompany the Rethink Experience to make the system more comprehensive. This workbook could offer additional information and tips for students, providing a comprehensive and in-depth resource for improving their digital well-being. It could also serve as a journal, allowing students to document their experiences and reflect on their progress over time.

Lastly, an option of resurfacing the past personal data from the Rethink prototype could be designed. This could encourage users to come back to draw new reflections and receive an update for their Aftercare. It could be done through the use of NFC tags or mobile applications to create personalised access tokens.

9. Conclusion

The aim of this project was to create an experience which would allow users to critically reflect on their digital space through a tangible design. Through several different user studies, data was extracted to enable a design process of such an experience as well as multiple hands-on design activities were done to create The Rethink Experience. Rethink enables people to create a deeper level of awareness about their personal digital space through physical interactions and an aftercare system, thus achieving our project goal.

The design process and approach is linked to both data-enabled and user-centered design, taking a highly iterative approach to using data from user studies to really put the user at the center, as seen in Figure 9.1. This resulted in a well-informed process where we were able to add a new depth to our final design because of the wide variety of gathered user data. The final validation in context indicated that the design could be suitable for a broader range of people, beyond just Industrial Design students and that there is a potential to further develop the aftercare system into something more extensive and elaborate. Future work can focus on improving the design and interactions itself, allowing for a bigger user experience exploration through new user studies. Next to this, there is great potential to help with improving digital well-being but as we only focussed on creating the awareness that was needed, this can be considered as a future exploration to be done.

All in all, the Rethink Experience and the Aftercare created a great first step in enabling people to be more aware and be able to critically reflect on their digital well-being and overall digital space.

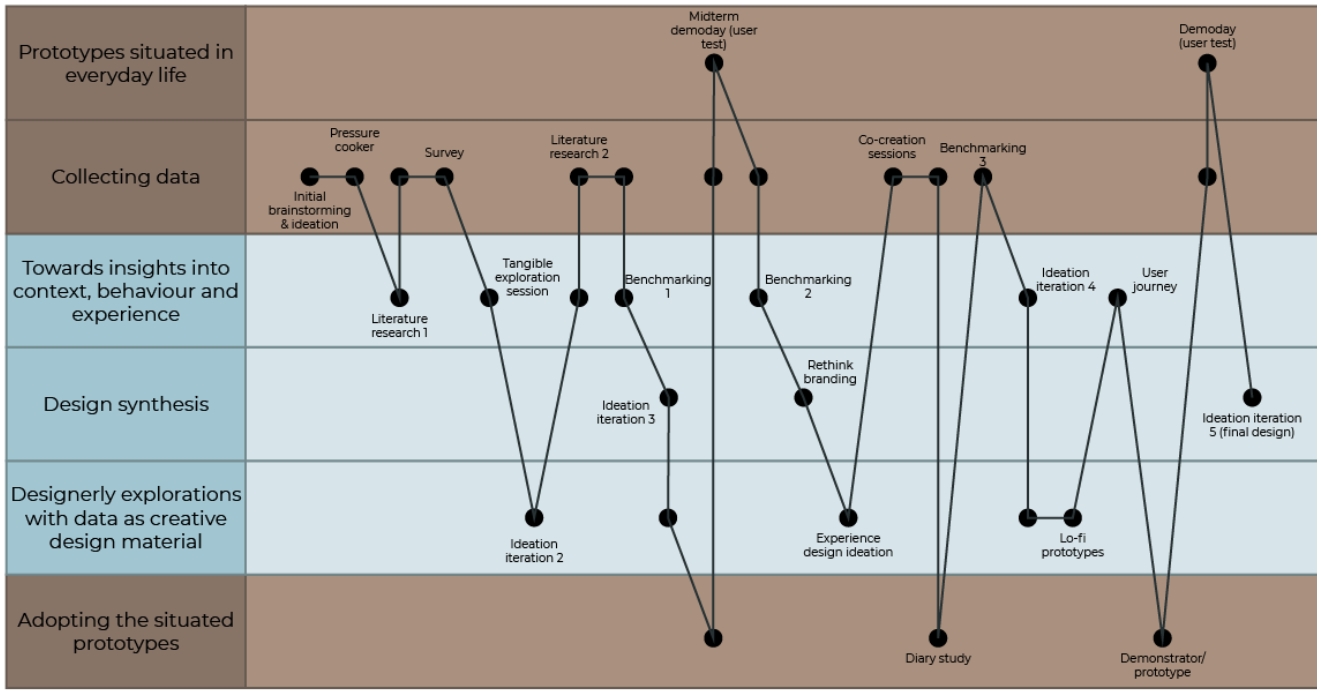


Figure 9.1 - Project process

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Agglomeration of melted candle wax, plus burning candles, in a Tallinn restaurant by Steve Jurvetson, retrieved from Wikimedia Commons, Used under Creative Commons Attribution-NonCommercial-ShareAlike 2.0 Generic license <https://creativecommons.org/licenses/by/2.0>

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Appendix

The full appendix is included as a separate file. This was done to make the report file too big and long and easier to navigate through. Here you can see the table of contents for the appendix, please refer to the other file to read these chapters.