

Why Should I Care About My Data?

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Abstract

The purpose of this project was to explore the relationship casual internet users have with their personal data and offer a design concept to help build that relationship. I looked into peoples' attitudes towards personal data, how they think it is used and if they try to manage their personal data in any way.

The project is done following the double diamond framework, discovering first about the topic of personal data with desk research, expert interviews and user research. From the findings of expert interviews, I narrowed my target group down to high school students. From the probe study and interviews, I learned that people don't think they are susceptible to the dangers of personal data based personalized Internet experience but worry about others, that could be less knowledgeable. Also, it is difficult for people to see uses of personal data beyond company profits, especially targeted advertising.

Based on these findings I set "How might high school students use their personal data in a perspective broader than company

profit?" as my design challenge. To develop my design concept, I held two co-creation workshops with high school students. As a result, I offer a game that can be played in the classroom environment that helps students form their opinions on the topic of personal data. The game guides students through a personal journey of data analysis and data governance by using analogies and leaves room for discussions.

Kokkuvõte

Lõputöö eesmärgiks oli mõista interneti kasutavate inimeste suhet nende isikuandmetega ja pakkuda välja disainilahendus, mis seda suhet tugevndaks. Inimestelt uurisin, kuidas nad isikuandmetesse suhtuvad, millisena näevad nende kasutus-alasid ja kas proovivad kuidagi oma isikuandmeid hallata.

Töö järgib topelt teemanti raamistikku ja esmalt avan enda jaoks teema läbi olemasolevate materjalide, ekspertintervjuude ja kasutajauuringute. Ekspertintervjuude põhjal valisin töö siht-grupiks keskkooli õpilased. Uuringust ja intervjuudest avastasin, et inimesed ei tunne, et nad isikuandmete abil personaliseeritud interneti kasutades end ohtu seavad, aga muretsevad teiste pärast, kes teemast nii palju teada ei pruugi. Lisaks ei oska inimesed leida isikuandmetele laiemat kasutust kui ärilise kasu teenimine, viimast eriti läbi sihitud reklaamide.

Disainilahenduse väljatöötamisel sai minu uurimisküsimuseks “Kuidas oleks keskkooli õpilastel võimalik oma isikuandmeid endale väärtuslikul viisil kasutada?”. Lahenduse leidmiseks

kutsusin keskkooli õpilased kahte koosloomise töötuppa, mille tulemusena valmis mäng, mis aitab õpilastel isikuandmete teemal oma arvamused luua. Mäng toimub koolitunni raames ja viib õpilased seiklusele, kus nad läbi analoogiate ja omavahelise arutelu õpivad andme analüüsimisest ja haldamisest.

1. Introduction

1.1 Inspiration from my job as a User Experience Designer

I work as a User Experience designer in an Estonian digital agency. A client who is very close to the state asked me to design a simple cookie consent form. Turns out it's not a simple topic at all.

The client wished to have the form in a modal window, which would blur the website's content and make it inaccessible unless the visitor accepted cookie settings presented in the form. This would ensure that the company would get as much user data as possible for data analysis and targeted advertising.

Through research into what pattern to use for the modal, I discovered that the client's approach would not meet the General Data Processing Regulations requirements. In the end, we had to consult a legal team and were advised to design a modal that allows the user to browse the website before

accepting cookies and gives the user options in which cookies they do or do not want to accept.

This got me thinking, if a company that operates on the state level is unsure about data regulations, how could we expect casual users to comprehend their data rights?

This very concrete example leads to a broader topic of data-driven design. Today, it's fundamental to gain insights into and evaluate the success of design solutions from web analytics. And, it's becoming more plausible for ambitious clients to look into cross-referencing personal data like a person's location and interests to create solutions that go beyond targeting the right customers to designing their behavior.

As a designer representing the viewpoint of the people using the services, I sensed a big gap between customers even understanding what data is being collected from them and companies holding the knowledge of what they could do with the data. As a designer, I sensed that instead of designing with the people, this would lead to designing the people.

1.2 Societal Inspiration

The personal data topic has been brought to the general public's attention by scandals and documentaries covering those scandals. I too watched the Netflix documentaries "The Great Hack"^{*} and the "Social Dilemma"^{**} that covered the Cambridge Analytica scandal about meddling with the 2016 U.S election and the dangers of social networking.

I was very concerned with what I had learned, not because of the dangers outlined, but because I was taken aback by how little I considered these topics in my own work creating the future.

"Social Dilemma" created a buzz in my peer network and I decided to use my degree project to analyze the impact of learning about their personal data has on my peers. This would

^{*} "The Great Hack" came out in 2019 and tells the story of the Cambridge Analytica/Facebook data scandal where data gathered from millions of Facebook users was misused by the Donald Trump presidential campaign. It elaborates on whether using social media puts us in danger of being controlled by it.^{35 36}

^{**} "Social Dilemma" is a Netflix documentary released in 2020 covering problems associated with social media platforms. It covers the impact of social media use to mental health, to democracy and also talks about the danger of algorithms driving discrimination.¹⁶

give me the opportunity to familiarise myself with the topic of personal data for my work and also contribute by offering an EU-based user-centered view on how personal data could be used as currently, the information about how to benefit from data-based insights is largely in the U.S Big Tech^{***} context.

^{***} Big Tech consists of Amazon, Apple, Facebook, Google and Microsoft, the largest and most dominant companies from the United States information technology industry.³⁴

2. Background

2.1 Personal Data

My project focuses on personal data, various categories of information related to an individual. According to the European Commission, to be counted as personal, the data must come from an identified living individual or lead to the possibility of identifying a particular person. Some examples of personal data are the name, home address, e-mail address, location data, and a cookie ID.¹⁴

In addition to this definition, concrete examples of what data is collected from individuals would help to comprehend what personal data is. Therefore, as an example, below there is a list of the data types Facebook collects of their users.

Also, it helps to look at the broader categories the information collected could be divided into. The multitude of categories varies from financial to health-related data.⁵ Figure 2 illustrates the structure of those categories.

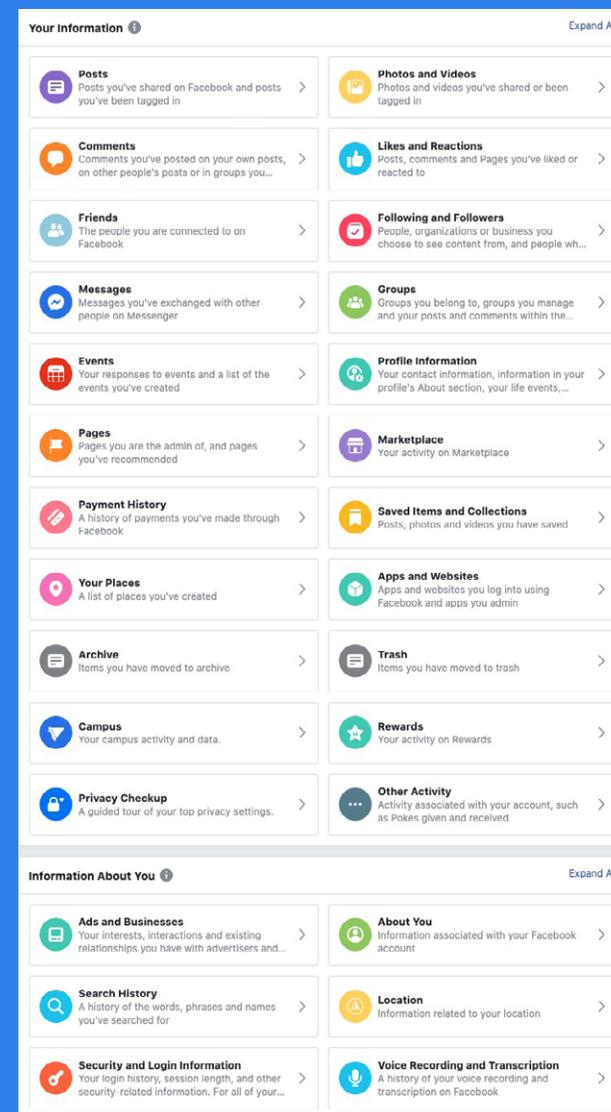


Figure 1. Data types Facebook collects from their users.¹⁵

What personal data is, is best understood through looking at examples of data collected by companies. Learning what personal data is and what kinds are collected from us, didn't reveal to me how my data could be used by the companies for profit.

2.2 Uses of personal data

In addition to understanding what personal data is, I also wanted to understand how it is used. To narrow down my exploration, I focused on the realm of social media as I was inspired to look into the topic by the documentaries *Social Dilemma* and *The Great Hack*. Both documentaries address the relationship between people and technology. It is proposed that technology is a tool used on people by other people.^{35 36 16} People's personal data gathered from social media networks is analysed and it's main uses are 1) profiling, 2) targeted advertising, and 3) behavior modification which are more thoroughly explained below.

→ Profiling

Profiling is collecting a variety of data about a person so they could be categorized into a segment with other similar attrib-

utes. Data gathered to put together profiles can be web browsing data, search histories, media consumption data (e.g., videos watched), app use data, purchases, click-through responses to ads, and communication content, such as what people write in e-mails (e.g., via Gmail) or post on social networking sites.⁸ Also gender, age, race, occupation, location data, friends, and family connections.⁹

To illustrate the magnitude of profiling, Facebook has individual profiles of 1.65 billion people and AddThis has profiles of 1.9 billion people.⁸ The most specific form of this is psychographic profiling. Cambridge Analytica, for example, uses the OCEAN Personality Model to

“understand what people care about, why they behave the way they do, and what really drives their decision making.”¹⁰

The OCEAN scale of personality traits are:

“OPENNESS Do they enjoy new experiences?
 CONSCIENTIOUSNESS Do they prefer plans and order?
 EXTRAVERSION Do they like spending time with others?
 AGREEABLENESS Do they put people's needs before theirs?
 NEUROTICISM Do they tend to worry a lot?”¹⁰

Once the individual profiles are created, data can be used to seek out specific profiles: anxious white males, stressed young mothers, angry teenagers, or undecided voters.⁹ Although relying on psychology to understand people's decision-making processes has a long history, psychometric profiling takes it on another level by mining vast quantities of personal data, which wasn't possible before and allows for a bigger impact on opinions and preferences.¹¹

Varying in specificity, profiling is the fundamental use of personal data onto which both targeted advertising and behavior modification are built on.

→ Targeted Advertising

Targeted advertising is a popular marketing service that promises higher sales by showing people the most relevant ads for them based on their profile and therefore lifting the odds of people engaging with the content. Below are listed the attributes people could be targeted by.

Location

Google estimates the general area that a person is in and recommends relevant results. They can also use past activity if the exact location isn't available and assume the places the

person would be interested in.¹³

Website visits

Website visits are converted into interests and relevant ads are then shown to the person. This means that two people visiting the same website may see different ads based on what websites they have visited before.⁸

Personal interests

Personal interests based advertising promises higher click-through rates compared to advertising targeting background characteristics. This means that advertising content about someone's favorite singer will produce more clicks than content related to the college they go to.⁸

Purchases

This ad category tries to persuade a person to either decide on or complete a purchase. The approach depends on the decision stage of the consumer. If a person has reached a narrow preference, then a high personalization level makes the ad more successful. Showing items consumers placed in their virtual shopping cart during a recent shopping session makes more people click than showing items that they viewed during a shopping session. If a person's preferences are still broad, more generic ads raise the likelihood of purchases.⁸

There are different levels of accuracy with which people can be targeted. For a more accurate targeting result, either a high-level profile has to be generated or the person's activity on a webpage has to indicate narrow preferences. The decision of which level of accuracy to use depends on the aspired objective. For basic publicity, a company can just use targeted ads based on more general profiles. For a more nuanced goal like molding the results of an election, the profiles have to be made more specific based on psychographic attributes. The abundance of information regarding targeted advertising suggests that this is the primary use for personal data introduced to the public as opposed to profiling and behavior modification.

→ Behaviour Modification

Behavior modification is designing interventions for groups with a certain profile to nudge their actions in a predefined direction. An example from a more general behavior modification comes from an experiment done on Facebook to determine whether emotional states could be transferred to others using emotional contagion without them being aware. In that experiment, Facebook users were either shown more negative or more positive content and the tonality and amount of their posts were then measured. It turned out that the hypothesis was correct and people's mood can be affected by

altering the tonality of their feed.¹²

To modify behavior on a more specific level, the psychographic profiles can be used to micro-target individuals. This isn't categorized under targeted advertising as the goal of messages tailored to people's personality can qualify as manipulation by targeting and exploiting people's decision-making vulnerabilities.¹¹ An example of this is the Cambridge Analytica scandal where people were swayed by sending them messages tailored to their personalities that would have the maximum effect on their political behavior.¹¹

This category of personal data use has quite a negative undertone as it raises ethical concerns about in whose interest the behavior is modified. Also, sources explaining behavior modification were the most difficult to find, rendering it shady or incomprehensible.

2.3 Challenges—how we got to this kind of data use

To understand the ethical concerns regarding personal data use better, I chose the book *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* by Shoshana Zuboff. According to Zuboff, the main problem with personal data use in the social media context is the possibility for big tech companies to profit disproportionately by constantly surveilling their users and creating prediction products based on the collected data.

Surveillance capitalism is relevant to the personal data topic as the author defines it as:

“...the unilateral claiming of private human experience as free raw material for translation into behavioral data. These data are then computed and packaged as prediction products and sold into behavioral futures markets — business customers with a commercial interest in knowing what we will do now, soon, and later.”¹⁷

The private human experience would be personal data. The data is then synthesized into insights that help to predict future

behavior and can therefore be used by companies to design the behavior most profitable by them.

The themes discussed in the book can be divided into two very broad categories: 1) disproportionate profits and 2) consent. As the book is written in mostly US context, I also explored the General Data Protection Regulation (GDPR) to gain a European perspective as well.

→ Disproportionate Profits

A new take on economic rent, Surveillance Capitalism introduces the Behavioural Surplus model that allows companies to collect data not related to a specific function that can be turned into prediction products. Shoshana Zuboff finally answers what is phase two in the business plan presented to us in South Park's episode "Gnomes" released in 1998.

Zuboff argues that in the absence of a user-friendly profit mechanism, Google discovered the Behavioural Surplus in 2002 and started the surveillance capitalism era.¹⁹ Behavioral surplus is explained best based on Zuboff's diagram illustrating the phenomena.

Before 2002, companies only used behavioral data from their service's rendered behavior to improve it as shown in the bottom loop of Figure 2. This meant that profitable services had to find a way to charge their users and fed the behavioral data back into their service to offer users a better product.¹⁹

Google though, didn't want to charge their users as it would have created friction with their product and looked for another way to make money. They discovered that in addition to the behavioral data that could be used to better the product,

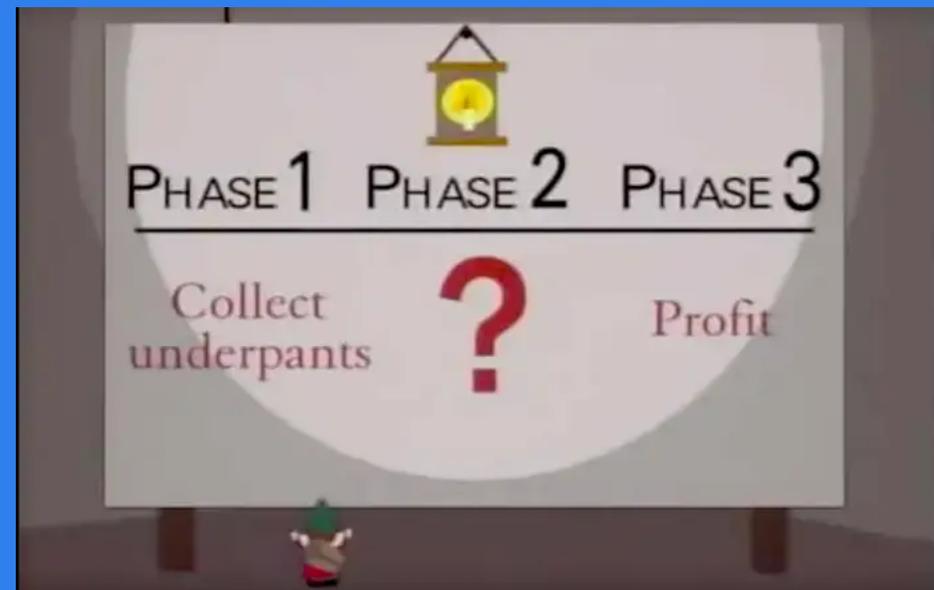


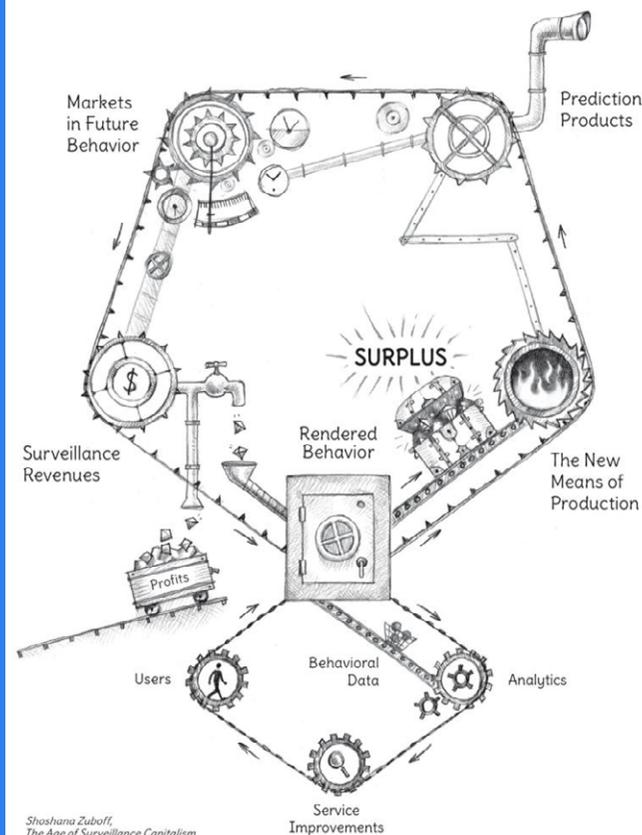
Figure 3. Gnomes' business plan. Screenshot, South Park—Season 2, Ep. 17—Gnomes.¹⁸

they also got a lot of bonus behavioral data—the Behavioural Surplus. And, they figured out a use for it—Prediction Products (step 2 in the Gnomes’ business model) that they could sell to advertisers in Future Behaviour markets, promising to take chance out of advertising and replace it with science¹⁹ This is where it all went south and surveillance economy companies like Google, Facebook, Amazon, and Apple started hoarding all possible data to perfect the Prediction Products.

To conclude, the discovery of the Behavioural Surplus disrupted the balance of getting data from in exchange for the users getting a better service. It created a model where the companies could profit exponentially by gathering all the data they could and package it into products that have nothing to do with the initial service from which the user’s data was collected from. Why the user hasn’t protested against this model could be that profits are not a very relatable issue for a user of social media for example. As the knowledge of how to turn people’s raw data into valuable insights is in the hands of the companies, people are not aware of what they are giving up for the free services.

The Discovery of Behavioral Surplus

Surveillance capitalism begins with the discovery of behavioral surplus. More behavioral data are rendered than required for service improvements. This surplus feeds machine intelligence - the new means of production - that fabricates predictions of user behavior. These products are sold to business customers in new behavioral futures markets. The Behavioral Value Reinvestment Cycle is subordinated to this new logic.



Shoshana Zuboff
The Age of Surveillance Capitalism

Figure 2: The Discovery of Behavioral Surplus

Figure 4. The Discovery of Behavioural Surplus from Shoshana Zuboff's book "The Age of Surveillance Capitalism".¹⁹

→ Consent

In addition to low user interest in their data, Big tech also moves too fast for the regulation protecting the interests of the users to keep up. The emerging policies cover how users can give or retract their consent and regulate how companies can use and store data. From the users' side, though, the awareness of these possibilities is still low.

According to Zuboff, users never got to think about whether they agree to personal data collection or not. As the industry using personal data develops at break-neck speed, the world became dependent on the products before the public understood that sharing behavioral data should be a decision, not a default.¹⁹ Google's tactics that helped distract from the absence of consent were using belittling terms for the Behavioural Surplus like "digital exhaust" and "digital breadcrumbs".¹⁹ Europe signaled its firm stance on data privacy 16 years later in 2018 with the GDPR, the toughest privacy and security law in the world.²⁰

The GDPR states that the processing of your personal data is based on your consent and the consent needs to be based on an informed decision and expressed through an affirmative action from your side. The GDPR defines the person whose

data is processed as the data subject. The rules of GDPR that constitute consent from a data subject so that a company could process their information are that consent must be freely given and clearly and in the plain language requested. The data subject can also withdraw their consent whenever they want.

Although the GDPR has given the data subject such rights as to be informed, have access, erase, restrict processing or move their data from one company to another, for the user, the actionability of these rights is still low.²⁰ In a 2019 survey requested by the European Commission it was stated that although most (67%) of respondents have heard of GDPR, those who have heard of it and know what it is (36%) and those who have heard of it but don't know exactly what it is (31%) are split almost evenly. In Estonia, 28% of the respondents have heard of GDPR and know what it is, 30% of respondents have heard of it, but don't know exactly what it is and 41% of respondents have not heard of it.²¹

Lack of awareness of current policies and topics covered by them don't encourage users to learn about what data they produce and what could be done with it, putting the user in a passive role of allowing or denying access to an asset which value they don't comprehend. To analyze the responsibility of the policymakers, the question arises whether the legal require-

ments are a bare minimum or a maximum target to reach.

To conclude, the tech industry sped ahead of the regulation, and people value using products they are used to more than their control over their privacy rights. The GDPR has established a solid base for granting people rights for their data and its use, but awareness and about those still needs to be raised for people to use their rights.

2.4 Opportunities to Intervene

To help people comprehend the value of their data and raise interest in what can be done with data and how to regulate it, I would like to address the problem in the now, not in a possible future where people would already be aware of the uses of data.

When positioning my intervention, I asked myself whether to design in the future or in the present. I could use a speculative-design approach and imagine what the preferred future would look like and then provide a solution to work in that environment, as Taavi Aher (2020) did in his master thesis “Control and Ethics in Digital Identities. New opportunities through inclusive personal data management”.²² To get to that preferred future,

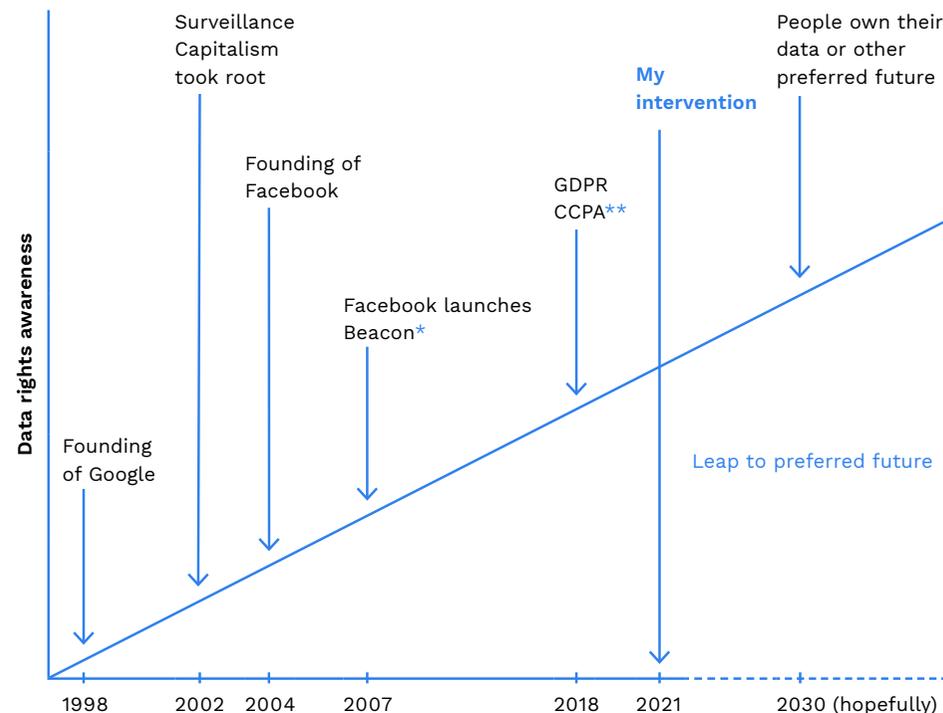


Figure 5. Topic timeline guiding my decision where to intervene. The data rights awareness line is illustrative based on my interpretation of the desk research findings.

* Beacon was Facebook’s ad program that shared people’s tastes by recommending a person’s recent online purchases to their Facebook friends. It raised privacy issues as it shared the information automatically unless people opted out of the feature.³⁸

** GDPR or the General Data Protection Regulation regulates how the personal data relating to people in the European Union is processed.³⁹ CCPA or the California Consumer Privacy Act gave California consumers new privacy rights to control the personal information they shared with businesses.⁴⁰

we need to raise people's awareness of data rights quite a bit for them to know to want it. Therefore, I would like to be a part of the effort to get us to that milestone by working on a design concept that would reach people now and help them to start taking steps in the preferred direction.

In Figure 5, you can see the topic timeline with key historical events and the rise of data rights awareness. You can also see the leap we still have to make to reach the preferred future.

→ Expert Interviews

To reflect on my understanding of the data privacy topic in today's Estonian context and learn about opportunities how to intervene right away, I conducted semi-structured interviews with 3 Estonian industry experts:

1. **Tanel Mällo**, a fair data, and responsible living enthusiast currently leading the Digital Literacy project at the University of Tartu.
2. **Sille Sepp**, the Programmes lead at MyData Global non-profit to empower individuals by improving their right to self-determination regarding their personal data.

3. **Ott Velsberg**, the Chief Data Officer for the Estonian government with the responsibilities to oversee data governance and data science in the Estonian government.

I narrowed the intervention points down to either establishing a relationship with one's data by educating them on the topic already in school which is explained below.

1. People are quite aware of the topic, but they don't care about it. As Tanel Mällo also writes in his blog, the digital world cannot truly become ethical and trustworthy unless people would care. And, for that, people need to **establish a personal relationship** with their data and what is being done with them. Without the personal relationship, we will and "ethical data use" over to the tech companies as we have done with food, and despite its deteriorative effect on our health, we indulge in whatever can be coated with taste enhancers.²³
2. In the expert's opinion, there are two ways to **spark that relationship: education and fear**. Both have convincing arguments so to create my point of view, I will rely on my User Research.

3. The responsibility of the individual also came up when talking to the Chief Data Officer of Estonia. He brought out that people don't know what are they agreeing to with the consent forms being a major pain point. To raise that knowledge, the government has plans in the early stages to **teach data literacy with the focus partially on schools.**

The theme of establishing a relationship with one's personal data seems very promising to me and as a designer, I could help map out people's values and emotions regarding the issue and offer some design principles to build the relationship on. The educational theme offers a possibility to narrow down the target group to school students.

3. Design and research methods

For my degree project, I followed the Double Diamond framework developed by the Design Council. It is a common design process with 4 stages. Each diamond represents a process to first explore the issue more widely (Discover and Develop) and then narrow it down for focused action (Define and Deliver). The design process is never finished as with every stage, every discovery or test result from iteratively improving the product or service may lead back to the beginning of the process.¹ Below is an overview of how I used it for my work:

1. Discover—the first diamond is for understanding the problem. As suggested by the Design Council, I talked to experts and conducted user research in addition to desk research to avoid assumptions.

2. Define—I analyzed the information gathered in the Discover phase by using affinity mapping and the Iceberg Framework. The findings helped me to reframe

the design challenge more accurately by using a User Need Statement and a How Might We Question.

3. Develop—in the second exploring phase, it's important to find inspiration from exploring different themes and co-designing with a range of people to give answers to the clearly defined problem. I held an ideation workshop and a co-creation workshop to develop my design concept.

4. Deliver—in this phase solutions are tested on a small scale and I held a second workshop to test the second iteration of my design concept.

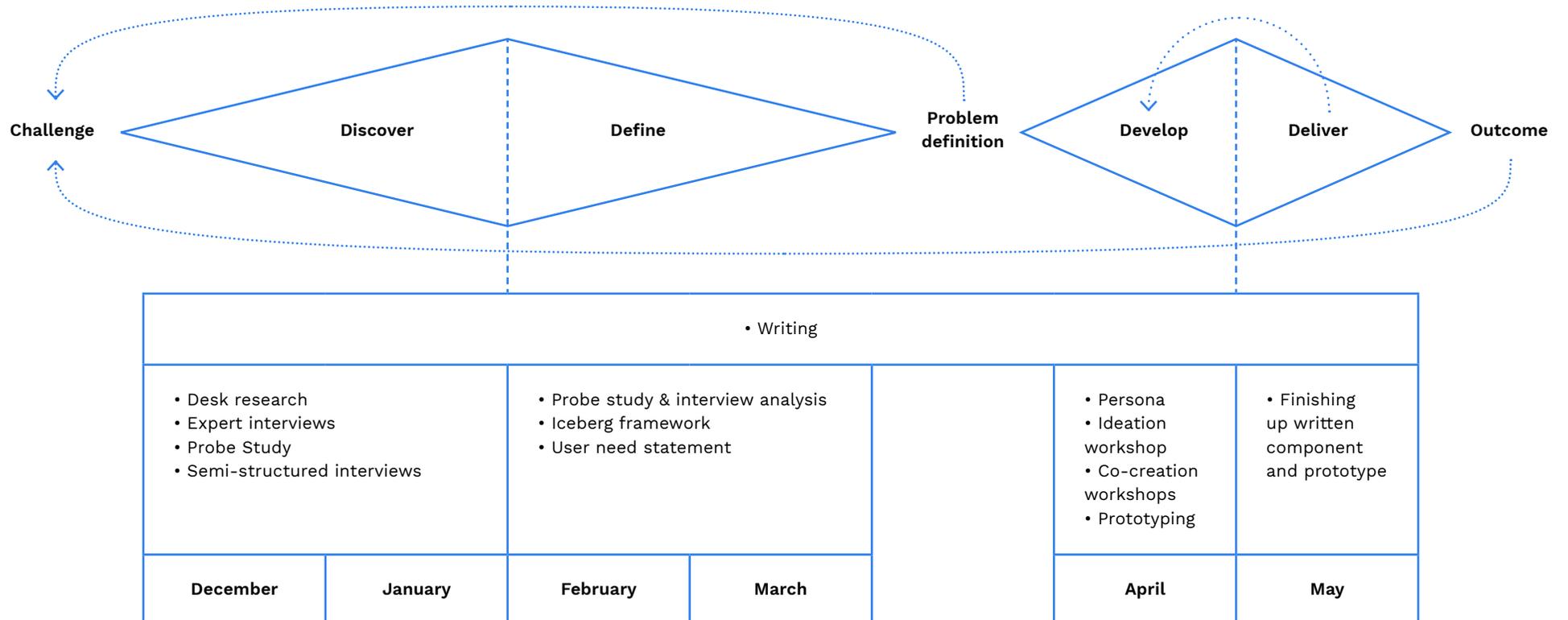


Figure 6. My process following the Double Diamond framework.

3.1 Discover

To start my design journey with the Develop phase of the Double Diamond, I conducted **desk research** covering books and articles to understand the topics related to personal data. I wanted to get a deeper understanding of the problems raised in the popular documentaries and put them in context with policies and organizations. The desk research material, covered in the Background chapter, was used later to triangulate the findings from semi-structured interviews and probes.

As desk research introduced me to a very wide variety of topics, I conducted **semi-structured** interviews with three industry experts (Tanel Mällo, Sille Sepp, and Ott Velsberg) to gain a more well-rounded overview and discuss where I could contribute with my degree project.

As it is an Interaction Design project, it is very important to build empathy with the people I would be designing for. I wanted to look at the issue in the Estonian context and I conducted a **probe study**. My topic was initially very wide as personal data concerns everyone who uses the Internet. To take a step towards defining my design challenge, I started my user research with 7 participants from my peer group. I wanted to see what is the knowledge level and hear the stories people

have about their experience with their data. The information I gathered with probes gave me a new perspective and sincere information on participants and their contexts. The findings were a basis for design ideas from a subjective, human-centered standpoint. As I want to awaken dialogue with users, probes also gave a nice starting point and exercise to practice that as they give ground to build a familiar relationship between the participating people and this enables continuous conversations.³

Although a short probe, this reflects well on how learning about your personal data would affect people's behavior. The participants had to complete **two exercises independently**:

- **Learning about different categories of personal data.**

The participants had to go to Facebook's "Your Information" page that outlines all the categories of data collected from users and allows the user's to review their data in each category. To make sure participants go through each category and reflect on it, they had to choose 5 categories that they think would reveal the most about them and place them on a map illustrating personal data categories (Figure 8).

- **Discovering the uses of personal data.** After exploring what data a company, like Facebook has on them, people had to do some independent research into how that data is used by the company. They had to share the links where they got the information and list out the uses of data. Also, they had to evaluate how good of an overview of the topic they think they got. This exercise aimed to see which sources people choose and whether the information is new to them or not.

After each task participants were asked to write a short reflection on what thoughts or emotions came up when doing the exercise.

To accompany probes, I also conducted **semi-structured interviews** to elaborate on the answers people gave in the probes and gain a contextual understanding of their knowledge. As desk research and conversations with experts gave me a comprehensive overview of the structure of the personal data topic, semi-structured interviews and probes helped me comprehend that information from an internet user's perspective.²⁵ I tried to schedule the interviews at least a few days after the people had finished the probe exercises so they could take in the subject and contemplate on it. The conversations helped to ground me and I learned a lot about how people think and why.

User research participants

	Education level	Area of work
Participant 1	Bachelor's degree	Entertainment
Participant 2	Bachelor's degree	Design
Participant 3	Master's degree	Communication
Participant 4	Master's degree	Marketing
Participant 5	Bachelor's degree	Advertising
Participant 6	Master's degree	Law
Participant 7	Currently in high school	—

Figure 7. Overview of user research participants' education level and area of work.

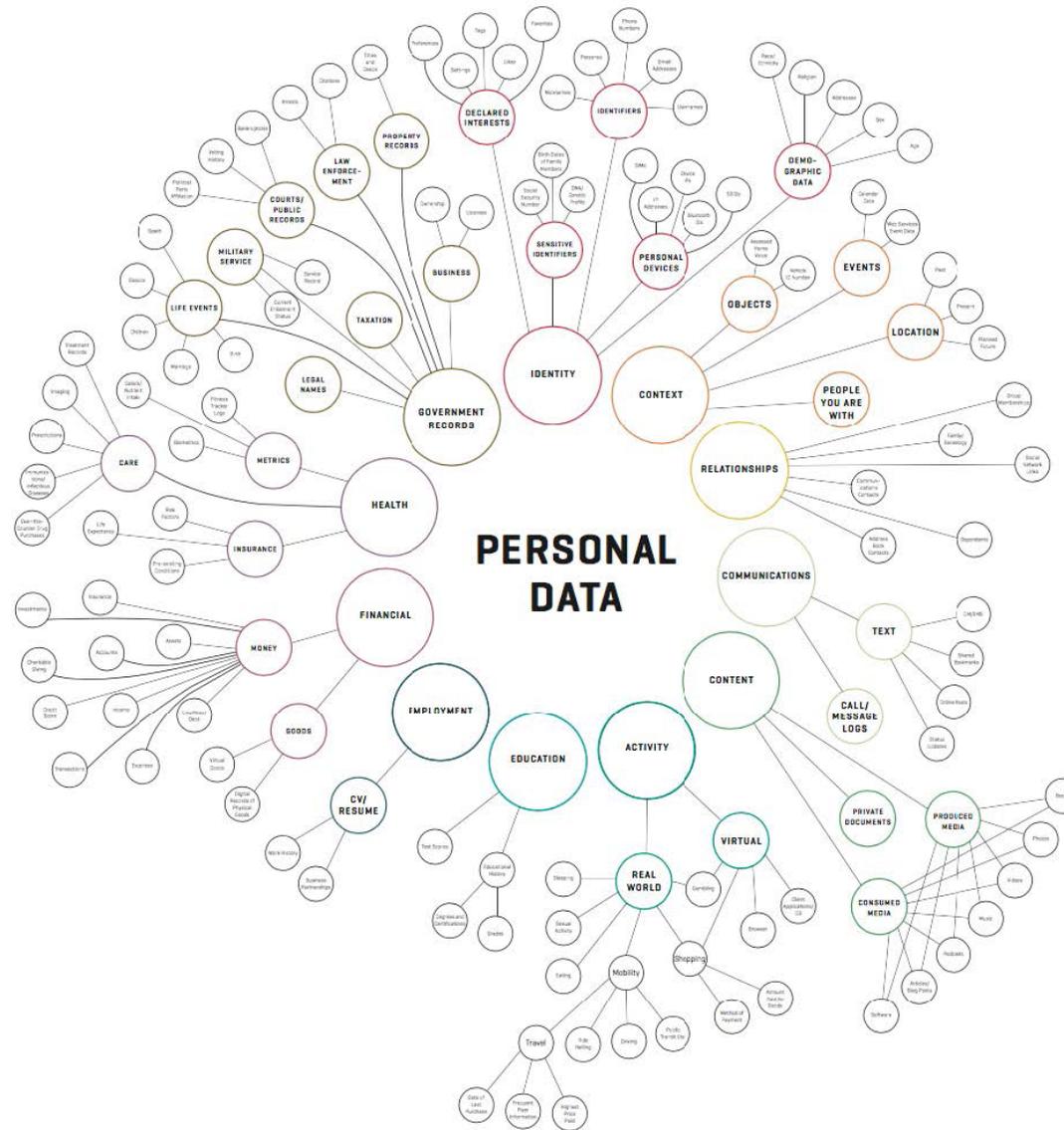


Figure 8. Personal data categories⁵

3.2 Define

After gathering information with desk research, probes, and semi-structured interviews, I was ready to start the Define phase of the Double Diamond. To analyze collected information from probes and user interviews, I used **codes and affinity mapping** to distinguish themes in the data. First, I transcribed all of my interviews. Then I read through all the probe results and interview transcripts and used interpretative codes to start analyzing the data.

Next, I set up a canvas for the **Iceberg framework** and started adding coded quotes to the appropriate levels of the Iceberg and establishing new codes based on similar themes. After the initial sorting, I evaluated the themes against my desk research findings and rearranged the themes when necessary.²⁶ I have previously used the Iceberg framework in an organization management context, but as a systems thinking tool, it is relevant to my work as establishing a relationship with your data is a part of the data protection system. The framework allowed me to view reality in the following layers:

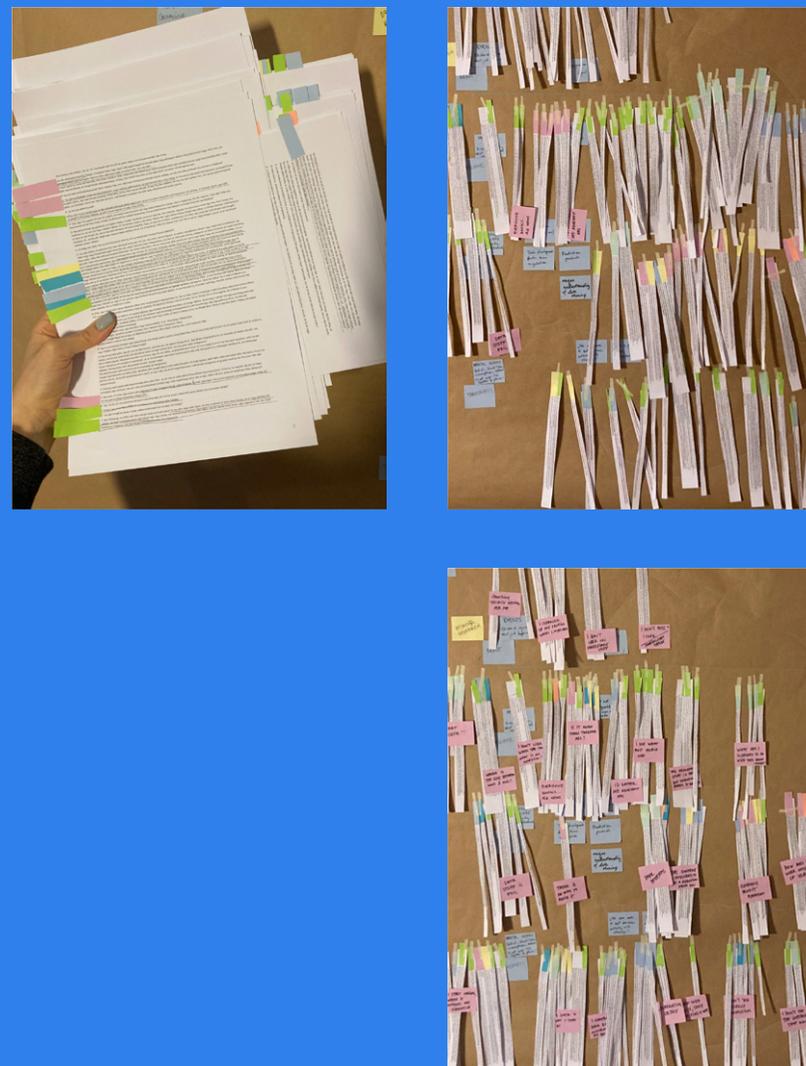


Figure 9. Codes and affinity mapping. Top left image: marking transcripts with interpretative codes. Top right image: dividing coded quotes onto the Iceberg framework layers. Bottom image: grouping themes in each layer of the Iceberg framework.

1. **Events**—situations we encounter on a day-to-day basis.
2. **Patterns**—accumulation of events that reveal patterns over time.
3. **Underlying structures**—how the system is organized to create patterns and events.
4. **Mental models**—the beliefs and assumptions we have about how the world works.⁴
5. The events are the only part of the iceberg that is visible and therefore they usually drive decisions that work short term. The framework, therefore, allows visualizing deeper parts of the system and strive for actions that have long-term impacts.⁴ I mapped out insights both from desk research and user research in the iceberg framework.

To collect these insights into an actionable problem statement and conclude the Define phase, I used the tool of a **User Need Statement**. The main purpose is to capture what I want to achieve with my design, not how. The components of the statement are a user, a need, and a goal. The pattern for the statement is as follows: [A user] needs [need] in order to accomplish [goal].⁶

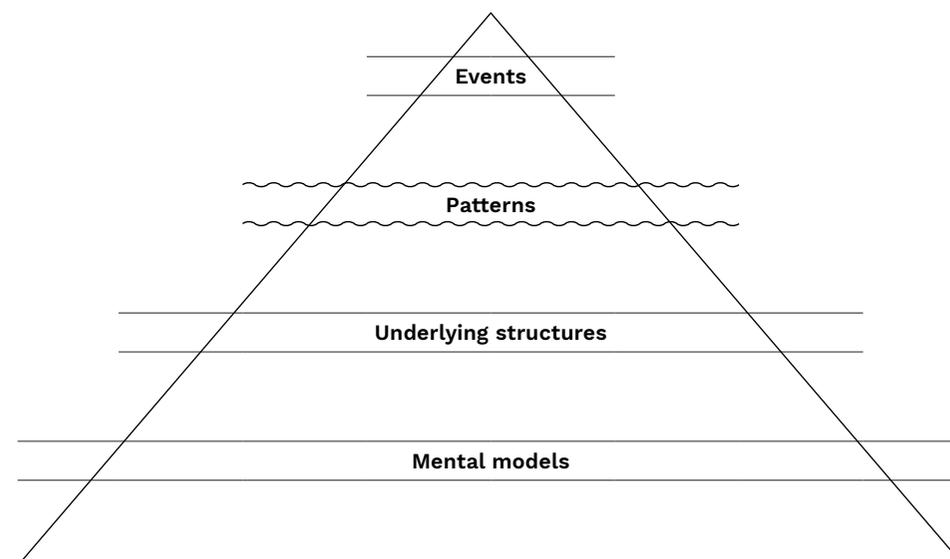


Figure 10. The Iceberg Framework

“A user need statement is an actionable problem statement used to summarize who a particular user is, the user’s need, and why the need is important to that user. It defines what you want to solve before you move on to generating potential solutions, in order to 1) condense your perspective on the problem, and 2) provide a metric for success to be used throughout the design thinking process.”⁶

Initially, I set my problem statement based on all of my user research participants. I realised, though, that my target group needs further definement and I reviewed my expert interview findings and looked for inspiration from the people I interviewed. As I elaborate in subchapter 4.3 Defining a Design Challenge, I decided to narrow my target group down to high school students as my work could then contribute to Estonia’s efforts of teaching data literacy in schools. Also, after revisiting the interview I had with the participant currently in highs school, I saw opportunities for a design challenge.

After narrowing down my target group, I set myself a **How Might We question**. The How Might We question is the final stage of the Define phase and leads into the ideation in the Develop phase. Setting a question to guide ideation helped me to frame a design challenge to prevent getting caught in pet solutions, which might not address the problems found.⁷

3.3 Develop and Define

I will give a shorter overview of the methods I used in the Develop and Deliver phases in this chapter as they are so interwoven into the process that describing them separately would make understanding them more difficult. They are explained more thoroughly in the “Developing a Design Concept” and “Design solution Proposal” chapters.

I started the Develop phase of the project by creating **Personas** based on my findings of the desk and user research. To make sure I was grounded in my research findings during the design phase, I also came up with **design principles** I would later use to evaluate my design concept.

Then, I could start with ideation for the design concept, and I conducted a **workshop** with 3 of my fellow Interaction Design students. I used the **Opposite Thinking** tool to structure the workshop.

After analyzing the results I got from the ideation workshop, I contacted 4 high school students and held two **co-creation workshops** to develop and test my design concept proposal. I used co-creation as previously my user research wasn’t focused on high school students and I needed to learn more

about them. The workshops were of great value as I was able to learn more about my target group and get inspired. They also provided instant feedback to implement in the next iterations of my design concept, and evaluate the validity of my work.

To finalize my design concept, I conducted **usability testing** of my final prototype with 3 teachers. With my test script, I wanted to systematically test whether teachers understand the tasks they have to facilitate for students, find out how the teachers would prefer to facilitate the tasks, and uncover any opportunities to improve the game.⁴¹

3.4 Limitations

The project was conducted during the Covid-19 pandemic. Therefore, the user research and testing were conducted entirely online due to safety reasons. This could influence the findings as observation of body language and group dynamics is limited with online interviews. Still, some people might feel more comfortable participating in research from their homes and be more open because of it. I tried to facilitate the interviews and workshops to be as open as possible to invite people to express themselves freely and observed their behavior as much as possible through video.

There are some risks with using probes. The data generated may be too ambiguous and fragmented or lacking focus for clear design decision making. To alleviate these risks, probes should not be the only research method.³ In addition to the probes, I also conducted desk research and semi-structured interviews and triangulated the findings when analyzing them.

In semi-structured interviews, it is important not to lead the interviewee's answers, so I put together a guide of open questions that I can use flexibly. To make the interview flow like a conversation, the order of the questions can be changed and some questions are either left out or elaborated on, as necessary to bring up unanticipated stories very valuable to creating empathy.²⁵

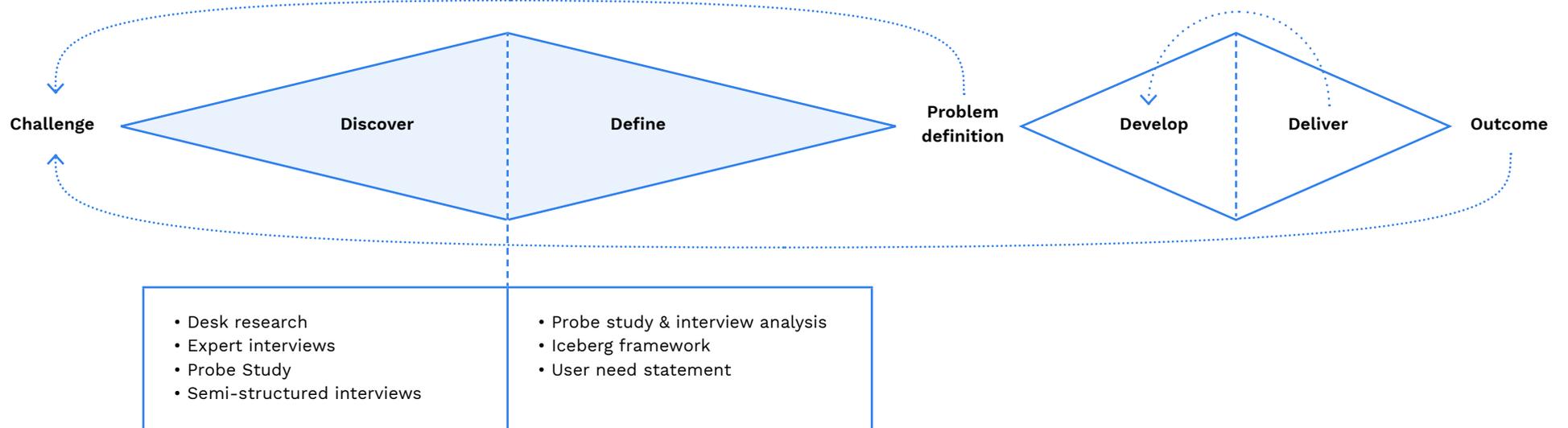


Figure 11. Working in the first diamond of the Double Diamond framework.

4. User Research Findings

In this chapter, I will give an overview of the findings of my probe study and semi-structured interviews. The user research helped my project immensely, helping me overcome assumptions developed while doing desk research and reach the valuable insight that the question my design concept should try to answer is why should people living in Estonia care about their data.

4.1 Probe findings

Overall, 5 of the participants completed the exercises with enthusiasm, 1 didn't understand the task, and 1 said that this topic has been talked about so much that it's getting a bit dull.

Interestingly, the placement on the data map varied quite a bit as seen in Figure 12. For example, Likes and reactions were mostly placed under Activity, but also under Government Records and Identity. Messages mostly ended up under

Communication but were also represented under Government Records. From the interviews, it occurred that the placement highly depended on the kind of information the participant had come across earlier. U.S related news spheres had directed participants to associate personal data with government records, for example.

Two participants highlighted the interconnectedness of different data categories, saying that the best insights about them would come from cross-referencing different data categories.

“As I don't post on Facebook or react to other's posts very actively, then I don't think a lot of information can be learned about me by analyzing those data types. Therefore, there is a bigger chance to learn about me from so-called passive sources like monitoring my location and the websites I visit there and also from an overview of all the messages I send on Messenger, the only messaging app I use.”

“Post likes and interactions—one this is what you post on Facebook, you may post out of certain interest and those posts are not always 100% true. However, the content you engage with and how you engage with it tells a lot more about you as a person, at least from my perspective”

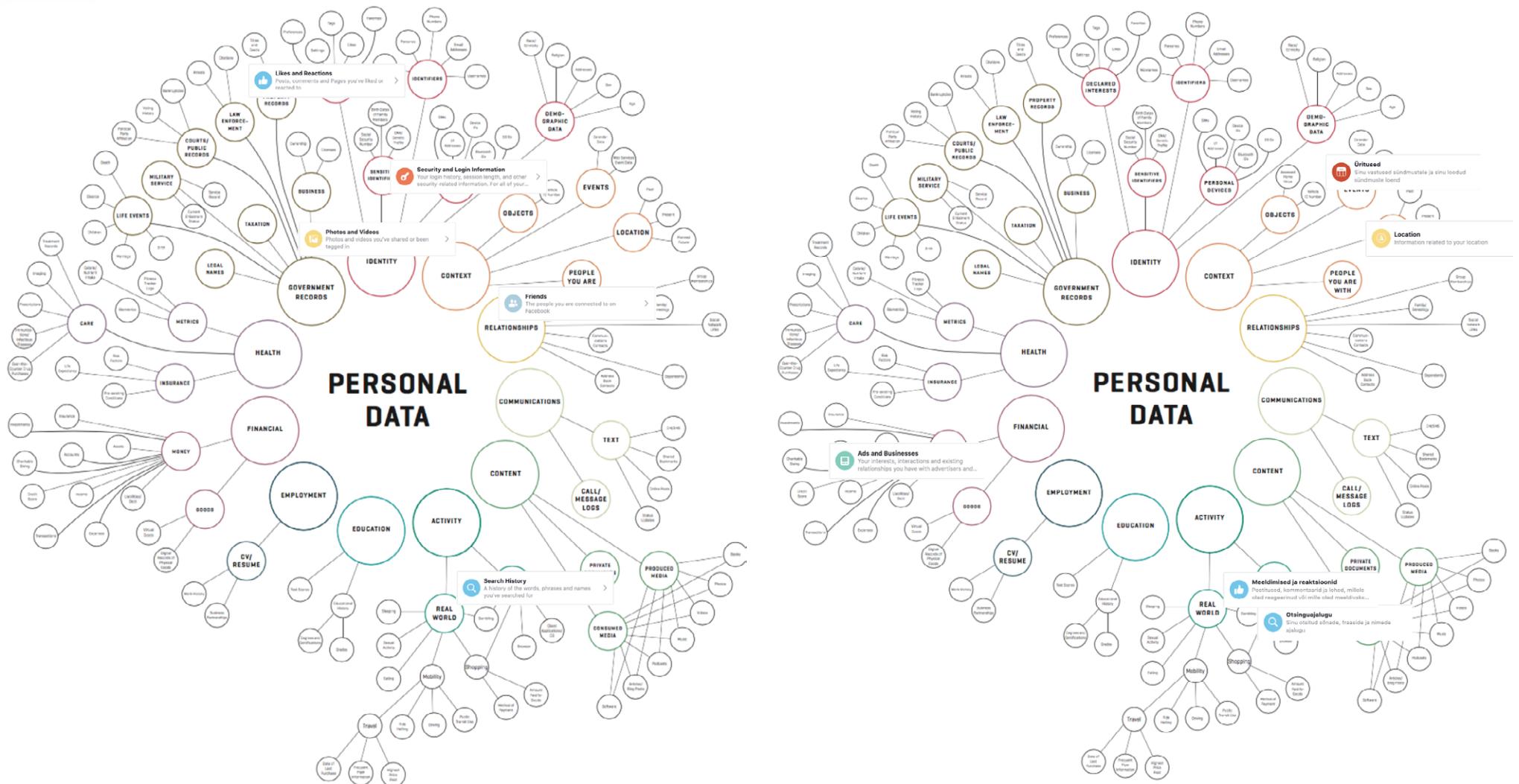


Figure 12. Personal data maps filled out by probe study participants. Note the same data type placed under completely different categories.

Others brought out more straightforward ways of learning about them through the data they produce the most—Likes and Reactions show what are they interested in, Friends show who they know.

“Friends—basically almost all the people I have interacted with in my real life, it’s quite a lot of people and also quite a lot of information. Sometimes it may come in handy though when you need to reach a certain person and you see that you have friends in common.”

“Posts show what I want to share with others. I definitely post less random thoughts on my wall that let’s say 10 years ago, now I mostly promote my work and occasionally participate in giveaways.”

Participants said that they are not very active users of Facebook and therefore think that the data doesn’t reveal much about them. They were surprised about Search History data as they didn’t realize that this was also collected and felt a little embarrassed about seeing how many times they searched for a specific person. But they also felt that probably everyone engages in some light internet stalking so it’s not a big deal.

4.2 Semi-structured interview findings

The main insight was that the scenarios in the media depicting the dangers of manipulation based on personal data and the characters that act them out, don’t resonate with participants on a personal level. They don’t recognize themselves as active internet users, meaning they don’t post their opinions or even pictures. Therefore, they believe they are capable of avoiding the dangers warned against in the Social Dilemma, for example, but are concerned for people less knowledgeable to fall into those traps. In the following paragraphs the main findings and their supporting quotes are brought out in four themes:

1. **Behavior on the internet**
2. **How data use is perceived**
3. **Thoughts on data regulation**
4. **Attempts of managing their data**

→ Behavior on the internet

This theme tells a story about how participants see themselves as they participate in the Internet. Most importantly, people see themselves as lurkers and not active members. They are affected by the network effect, using the same platforms as others do. They get cautious, when the dangers get personal, like an unfriendly stranger seeing their private information or find out their location.

Participants don't perceive themselves as active members of the Internet, they lurk in the background. They define an active member as someone, who posts, likes, or otherwise leaves a public trace of their actions. They described themselves as just observing the internet.

“In Facebook’s context, I think I am a kind of a lurker, I don’t post almost at all, I don’t like stuff actively, I don’t comment on posts or anything like that. So these categories won’t help much when you want to know stuff about me.”

Participants use the platforms most people use. When choosing which platforms and services to use, the most important aspect is what others are using as there is no point to choose a communication platform that only a few of their friends use.

“I know Facebook and WhatsApp are not the safest, but they are a way to communicate with others, so I didn’t bother to download another app that only 1-2 people use. It wasn’t important enough for me.”

Participants start caring when the consequences affect them directly. Intangible consequences like the loss of privacy or behavior modification don’t resonate with participants. They would get concerned though, if the consequences of misusing their personal data would affect them directly, like revealing their location to a specific someone or losing some money.

“Well, like a hypothetical situation, if someone gets access to all your sessions and your logins, they can easily like cross-track it and just say as you live here because like you log in from your laptop, for example, like this street you log in from your laptop and this street you log in from your laptop, you can cross-check and say like maybe—Okay, this is the location where you live in. And the other one is where you work at.”

“For me, it’s inevitable that all the things I do on the Internet collect data about me. But as long as it is just Facebook, then I don’t think the consequences can be so bad, as they don’t target me on a personal level but just to advertise to

me. But if it would be like stealing my personal data with malicious intent, for example, something about my bank account or something that is like a crime, then I would be a bit weirded out.”

→ How data use is perceived

The beliefs that shape the behavior are that they can see through the manipulation and deal with it by ignoring targeted ads. Data is seen as the company’s resource and the participants don’t express any claim on it.

Participants think they are not susceptible to dangers because they use the Internet passively and see through the ads. They are worried about others, who are less knowledgeable, though.

This reveals a mental model that participants think the information about data privacy is necessary, just not for them.

“I feel that I’m just not that easily manipulated, although I might be wrong. But yeah, I give some information out, and based on that I am then recommended stuff and I see through it. At least I hope. I still make independent choices.”

“I personally didn’t change anything. I think that if it would have been a person who has a lot of information up on

Facebook and uses it intensely who would have gone through all of those categories and thought through what data they share, then they would have definitely made changes.”

Targeted ads are perceived as the main use for personal data and participants just don’t click on them. When discussing personal data uses, the anecdote about talking to someone about a product and it appears in their feed afterward was brought up in every conversation.

“You know, there is always that conversation that if you say lawnmower, lawnmower, lawnmower three times, the next day you’re going to have a lawnmower ad in your feed, what’s up with that? And the first thought is oh, how scary. But then you start to think that ok, someone is sort of watching me, but at the same time the data is allegedly encrypted.”

“But I think they record something like the conversations too. And they use also your voice messages and data. So but it was like I put my phone down, the next time I look, it was there. So it was like a matter of minutes.”

Participants perceive that data is only used for company profit.

They see it as the companies’ asset and didn’t bring up any ways they themselves would like to use it.

“Facebook is always such an easy example, but all sorts of companies are constantly collecting data and would be just as selfishly interested in my data. Let’s say that my health data would interest pharmaceutical companies, for example.”

“In general, like, no one actually cares about me as a person. The data is used on aggregated terms to build profiles to power their algorithms. For example, Facebook powers its algorithms with photos. So they have this facial recognition technology, and they actually could get it done by people uploading more and more photos so can train the algorithm. And this is how it works now, for other people’s uses. Other businesses maybe grow, because they collect all kinds of data, and also my data makes them grow and grow even more.”

→ **Thoughts on data regulation**

The lack of interest might be rooted in a state of helplessness and confusion about stories heard on the media as they don’t apply to Estonia. They think that data is pointless to regulate, but the fact that tracking isn’t limited to the company’s website but extends all over the web still surprises many as extremely intrusive.

Participants perceive no way to avoid being tracked. They take it as a price to be paid for using the Internet and don’t think it’s a big issue.

“In the future, we may have a choice not to be tracked. But these platforms will still find a way to track. They will just adapt and invent new algorithms, so they will still track you. So I think you are kind of helpless.”

It’s unclear, how is data handled outside of the U.S. Currently, there is media coverage of data privacy in the U.S. context, but it doesn’t seem relevant in Europe.

“For me, it was positive that there was a normal explanation by Facebook itself because in the Google search results there were articles like how does Facebook profit off your data or is it wrong or right and whatnot, but I couldn’t rely on those right now. I looked at things from the Estonian point of view, and those were U.S based articles, I think it’s different there.”

Sharing with 3rd parties is unexpected. A common surprise for participants was that their data was not only collected on the specific platform but that all of their actions online are tracked and shared with Big Tech.

“The final thing I didn’t know about was that Facebook tracks users on pages outside of Facebook as well. I didn’t know that they were even allowed to do that.”

“It makes sense, that Facebook has the data that you fill out in your profile or if you message someone. But I don’t think I was aware that not only does Facebook tailor the service providers’ ads to me based on my habits, but service providers can actually get access to my data as well. The reverse side was quite a surprise. ”

→ Attempts of managing their data

As for what data the participants think they give out, they see it as something they actively publish like making a post or filling out a form. Therefore, to manage their personal data, they clean up their profiles and change their behavior. There is no mention of wanting to see or manage hidden data like activity logs.

Participants view their data as something they fill out. More subtle ways of engagement, like what pages they visit, for how long, where they stop scrolling, what they do afterward, were not considered.

“I picked those data types because where I’m not active, can’t be tracked. As much as I give information out, I can be tracked by.”

“So it’s your fault, you upload everything online, and you do everything online. If you don’t want people to know about it, then just don’t upload pictures, or don’t post about it. So you can keep some things private, although it is difficult to keep things private nowadays. But some amount you can control, like what you do and what you show the world.”

Participants cleaned up their profiles after high school to curate what they reveal about themselves. This was a very common finding. Cleaning up their profile gave the participants a sense of privacy.

“One year, I took it upon myself to delete most of the stuff from my profile, so I kind of managed my data, but I have never been to the Your Information page.”

“I’ve used the option to see how your profile looks to others, either your friends or complete strangers.”

Participants change their behavior to change their data. Besides cleaning up their online profiles, the participants hadn't tried to manage their personal data and got a bit confused by the question. They made the connection of when their behavior changes, the content they see changes as well, so they brought that out as a way to manage their data.

“I know the YouTube recommendations change really fast. If I have one kind of recommendations today, then it's enough to watch two hours of something completely different, and starting tomorrow, I will have those things in the recommendations.”

“I have an important role with my data, as I can influence the data I leave behind by my behavior and activities.”

4.3 Defining a Design Challenge

→ The Iceberg framework

To analyze the information collected in desk and user research, I used the Iceberg framework with 4 levels: events, patterns, underlying structures, and mental models. To use the framework, I also needed to narrow down my target group as currently there wasn't a specific focus to my user research. For this, I turned to my expert interview findings and look for inspiration from the people who participated in my user research.

One of the main findings from my expert interviews was that in Estonia, the state has plans in very early stages to teach data literacy in schools. Aligning with this initiative, I could narrow down my focus and also offer a designer's perspective on the issue. To offer a point of view rooted in real students' stories, I could use my current user research as a basis and build on it by validating my findings with high school students. To support that approach, I reviewed my interview with the one participant currently in high school and found that there were several opportunities for further research. I could look at educating high school students on the topic of personal data from the aspect of creating a narrative relatable for them and also explore themes of curating their learning experience in class.

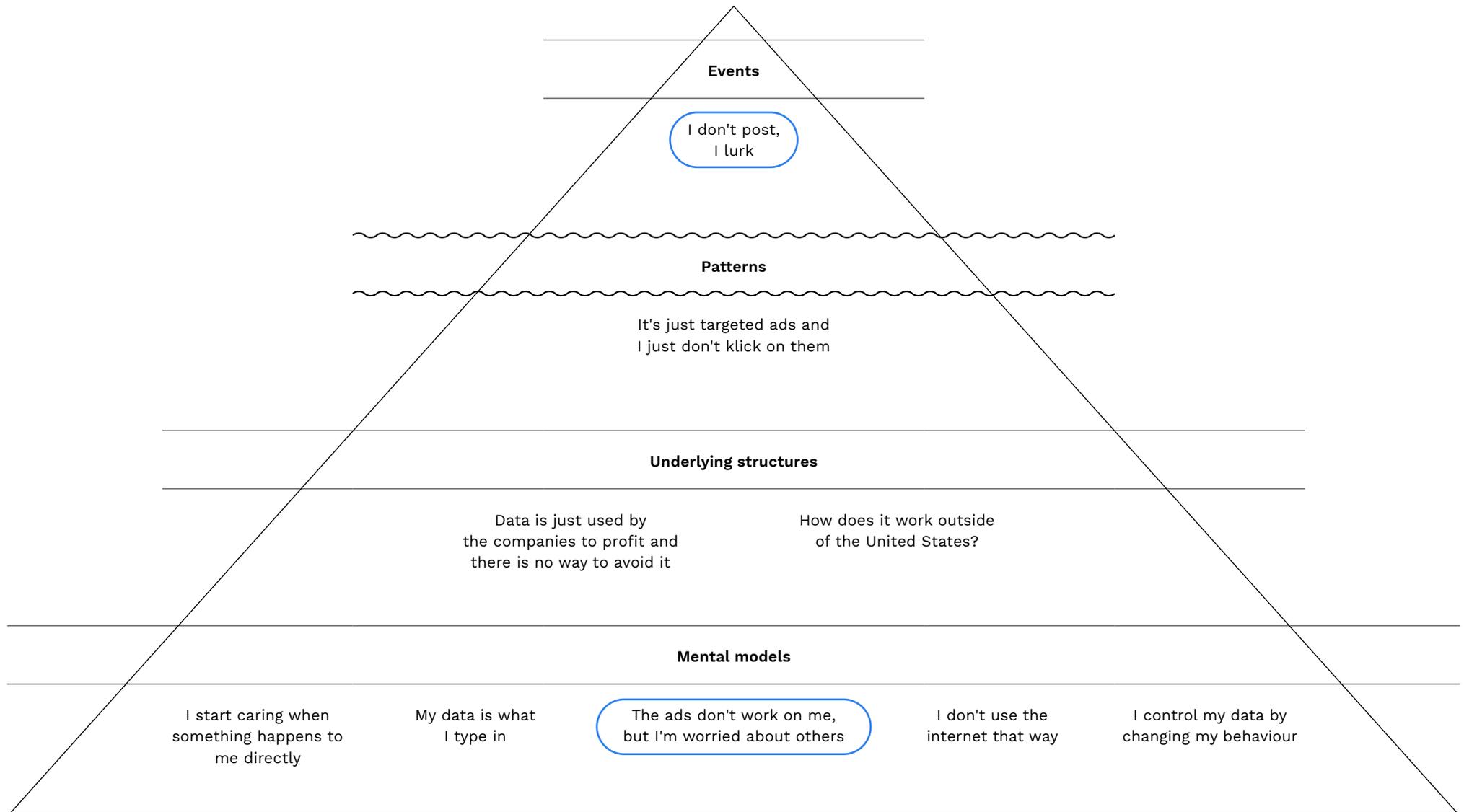


Figure 13. The Iceberg framework with findings from my research.

With the Iceberg framework, I wanted to create an initial understanding of how people relate to their personal data. The key finding from this analysis came from connecting the event of participants only lurking on the internet, not actively posting with the mental model that they think that their data is mostly used to target ads to them and they can avoid them but are worried that other people might be manipulated by them. **The participants think they are not susceptible to dangers because they use the Internet passively and see through the ads. This reveals that they don't resonate with the characters depicted in data privacy communication.** They think that data-based solutions are something one needs to see through and overcome with independent thinking.

They are worried about others, though, who are less knowledgeable and imagine their discomfort when learning this information. This means that they think the current communication is necessary, but for people with different Internet habits than them. The current communication is about the extremes, depicting the U.S based individualistic storyline where data is being used to addict people to social media and design their behavior for targeted ads. And, on the other end, there is the Chinese point of view of the government using data and AI to achieve a smart planned economy and automatically policing people to ensure wanted behavior.

For Estonian Internet users, relevant information would have to be about the lurkers. In this project, I could get a second opinion about this finding from high school students and address why is being aware of your personal data rights relevant for them. Also, educating students about possible uses of data beyond targeted ads and company profit would not only raise awareness of the less direct ways of collecting data about individuals but also open up the topic of exploring their data for personal insights and benefits.

→ The problem statement and the How Might We question

The problem statement concludes all of my previous research and frames the design challenge I will set out to validate and develop in the next phase of the project.

To form a problem statement, I have come up with a persona called Kevin who represents the user research participants. He doesn't care much about his data as he hasn't found the warning about data privacy use relevant and can't imagine much use for personal data except for targeted ads. Therefore, his problem is that he can't form an opinion on who and how should use their data until he doesn't see what could be of value in it. From his point of view, the problem is as follows:

Kevin, an Estonian internet “lurker”, needs to relate the uses of his personal data to establish a proactive relationship with it.

To address this problem in my target group of high school students, I want to focus on introducing creative and beneficial uses of personal data so that students could see beyond just the targeted advertising and learn about what they could do with their personal data if they understood the resource. So, to create value for Kevin the high school student, I shall generate ideas on a How Might We question:

How might high school students use their personal data in a perspective broader than company profit?

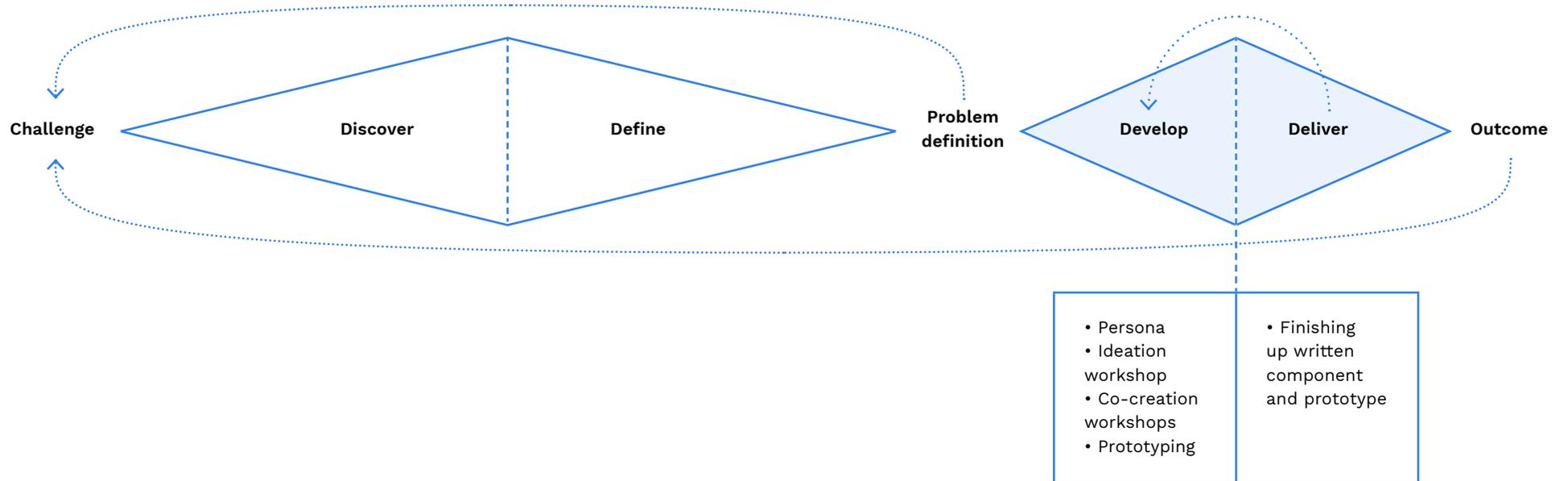


Figure 14. Moving into the second diamond in the Double Diamond framework.

5. Developing a Design Concept

In the develop phase of the project, I will look for an answer to **how might high school students use their personal data in a perspective that goes beyond corporate profit?** Together with the students, I will explore how they perceive personal data and how the introduction of the broader concept will influence their viewpoint on this topic. To incorporate the findings from the desk research into the design concept development phase, I put together personas and tried different idea generation methods.

5.1 Personas

To further analyze my research findings, I would like to introduce Ben and Kevin. I compared the persona depicted in the Social Dilemma with the persona composed based on my user research to bring out points where the story told in the media about the dangers of personal data stops being relatable for my users. Also, a persona will help me map out the needs and behaviors of my potential target group.

Ben is a persona based on the Social Dilemma and perceptions about how “others” might cope with personal data-based solutions gathered from user research. **Kevin** is a persona based on the people I talked to, depicting how they actually navigate the personalized world.



Ben — Glued to the phone

High school student
Lives in the U.S.

Needs

- Focusing on finishing high school.
- Staying in contact with peers through social media.
- Curating his online presence to fit in with his friends.

Behaviors

- Gets distracted by his phone a lot. His mother has already limited his phone use to have any conversation around the dinner table.
- Regularly comments on friend's posts and engages in public discussions that he might regret later.

Figure 15. Ben persona.



Kevin — Smarter than the ads

High school student
Lives in Estonia

Needs

- Also focusing on finishing high school.
- Also staying in contact with peers through social media.
- Curating and cleaning up his online presence to start applying to universities.

Behaviors

- Cleaning up his profile wasn't too hard. He hasn't been posting after some of his classmates made a fool out of themselves online.
- Data privacy doesn't concern him as he just doesn't click on the targeted ads.

Figure 16. Kevin persona.

→ Persona comparison

Seeing as these personas have some similarities but the people I interviewed still don't recognize themselves in Ben's persona, I wanted to compare them to develop design principles for designing for Kevin. This is a way for me to let go of my biases developed throughout the process and focus on the potential user of my proposed design solution.

As seen from the comparison, although both young men spend a significant amount of time on the Internet, Kevin is a lot more conscious of his behavior. He self monitors his time spent behind a screen and makes sure he doesn't end up in a content bubble that would bias his word view. Of course, living in Europe, as of now he is spared of major players like political parties manipulating him on social media.

In conclusion, Kevin doesn't think that Ben's story relates to him as he lives in a different cultural space and he is mindful about which data he gives out and how personalized services try to influence him.

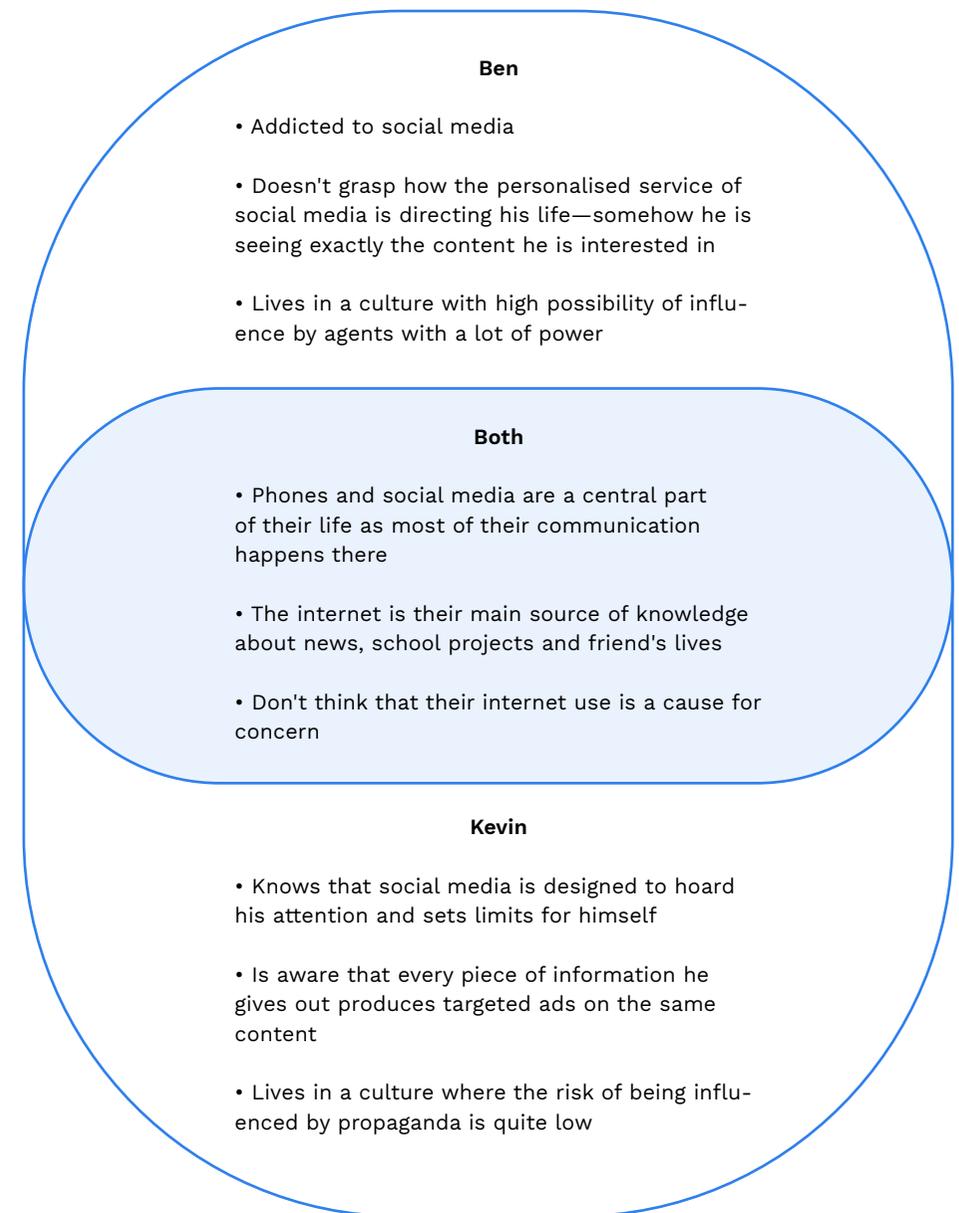


Figure 17. Ben and Kevin persona comparison.

5.2 Design Principles

The design principles, which describe the most important goals of the design solution, will be used to guide design decisions and evaluate if user's needs are met.²⁷ I grounded my design principles in the insights gathered along with research.

1. Create a relevant experience in the European context.

The documentaries I got inspired from tackle personal data from the U.S. viewpoint. From my user research, I found that Estonian people don't think these stories apply to us as it's a different cultural and political environment.

2. Allow implementing immediately.

By creating a topic timeline, I saw that I want to contribute to starting the discussion on the topic and not design in a possible future where people are already aware of their data and how to manage it.

3. Initiate discussion and make room for different opinions.

From my user research, I learned that people have a hard time making up their minds about how personal data should be used. I don't want to dictate an opinion for them but rather let them explore the topic and express their thoughts freely.

4. Bring clarity to how personal data can be used.

From the user research, I found that people mostly perceive that personal data is used to target advertising at them. I believe that there is a lot of room to explore beyond that and the knowledge would empower people to see their data as an asset, not as a tool used against them.

5.3 Ideation

To start the ideation, I had a brainstorming workshop with my fellow design students. To challenge assumptions on the topic of personal data and see it in a new sphere of possibilities, I chose to use the tool of Opposite thinking.²⁸ Each participant had to list their assumptions on the uses of personal data, then reverse these assumptions and finally come up with ideas based on a question "How might you use your personal data?"

The workshop was very useful for illustrating how people approach the topic. Assumptions on data uses were very general and weren't connected to any specific feature that could be built on personal data. Also, the assumptions had a negative undertone, hinting at the tonality of the information they had heard about personal data. Assumptions about the uses of personal data:

“Somebody is always tracking my data”

“Everything I do can and will be used against me”

“My data is useful”

“I have no control over my data and how it’s used”

The ideas that came up in the brainstorming workshop were mainly about being informed about one’s personal data being used by having a data management service, but the participants thought that this sort of service would be a bit overwhelming as there are already a lot of things in life to manage.

A few of the ideas also were about positive uses of data that sparked interesting discussions about whether targeted ads could be framed as data-based discounts.

The main findings for me were that **without framing the topic, people will be limited by the negative associations they have with the topic and think of data-based solutions as something that can be done to them, not something that they could participate in.** Also, seeing the challenge in getting participants to ideate on the uses of personal data, I saw the opportunity to design a method to facilitate forming a concise opinion on personal data and its uses as opposed to designing a tool for working with your personal data for example.

Ideation workshop using the Opposite thinking tool

Format	Online workshop
Purpose	Idea generation for design concept directions
Participants	3
Length	50 minutes

Figure 18. Ideation workshop structure.

5.4 Exploring Themes

From my ideation workshop, I got inspired to explore the theme of forming an opinion. By experiencing how unexpected the workshop results can be, I wanted to embrace it and make room for individual creativity. Also, I felt that the way I framed the topic of personal data use could be improved. The themes I explore regarding those findings are co-creation with students and analogies for data.

→ An art-based approach to initiate a relationship to one's data

As it is important to start with establishing the conversation, an art-based approach would suit it well as it allows for discussion, expressions of different viewpoints, and facilitated participation by the audience.

With an art-based approach, I can connect to my audience on a deeper level and have a higher chance of igniting compassion, empathy, sympathy, and understanding both on an individual and collective level. Art itself won't make change happen, but it prepares the ground by encouraging individuals and groups to identify and shape their values.²⁴ Also, since I don't want to offer a resounding answer with my design solution but rather

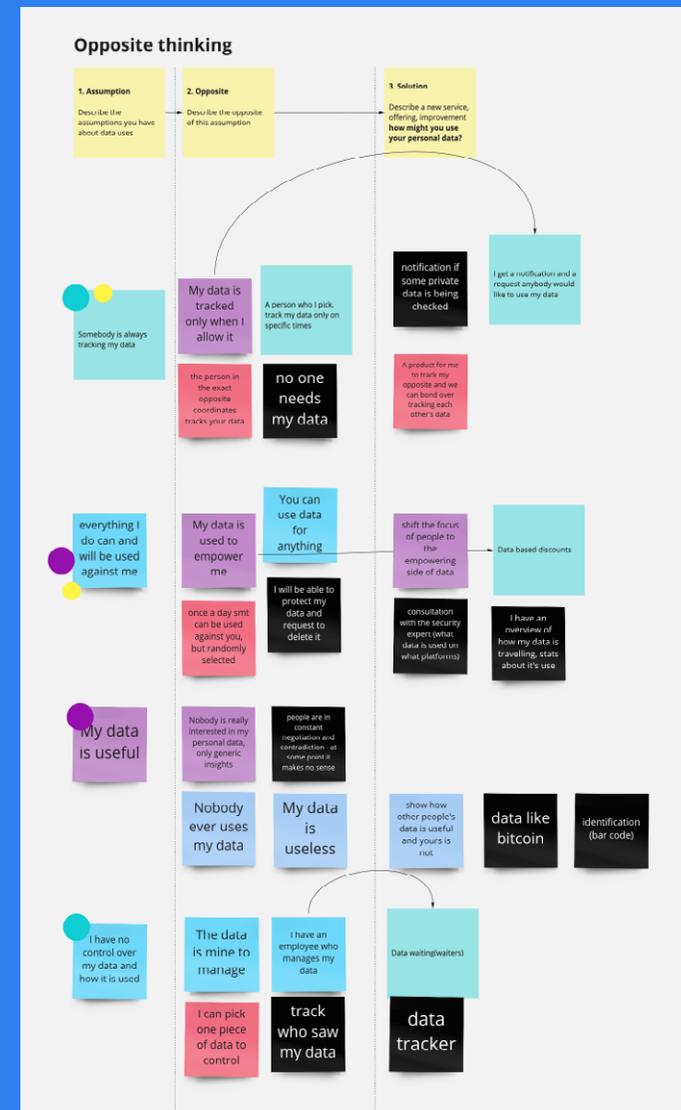


Figure 19. Opposites thinking workshop. Assumptions, opposites, and ideas.

open up the discussion on what a person's relationship with their data could be, strategic use of participatory and interactive art enables contending groups to express their standpoints²⁴ making the topic more transparent and less biased.

Lastly, as there are a lot of negative sides to this topic and few convenient solutions, moving towards a preferred solution might seem out of reach. Hence I highly appreciate the last key suggestion to facilitation by Kirakosyan and Stephenson:

“Finding ways to foster and nurture hope for the future among those with whom they work.”²⁴

This guideline reminds me not to just add to the loom with my design concept but to offer or co-create a silver lining for this overwhelming topic.

→ Co-creation with students

Co-creation is a very broad term about collective creativity, but I am looking into it from the perspective of students co-creating their learning materials. Co-creation is an act of creativity shared by two or more people.²⁹ With students, the power of co-creation lies in the responsibility and ownership they mani-

fest when they are allowed to co-create their learning experience. When looking at areas where students could contribute, the use of technology is a very potent area.³⁰

In user interviews, I asked about data literacy education in schools and although students have classes in basic programming, some teachers still struggle with unmuting their microphones in online classes. This could limit discussion on the topic across subjects, a big setback on a topic such as personal data that can indeed be covered in programming class but should also be looked at in the context of societal studies, for example. By giving students the tools to co-create that discussion, they could become much more engaged in the topic. Moreover, the “storylines” students come across in the learning process influence the way they perceive themselves and their abilities.³⁰ Co-creating the stories surrounding personal data together with students is an inspiring design path I am eager to explore.

→ Data analogies

As a basis for the co-creation of stories, I have chosen analogies as a tool to aid the learning process. Personal data is a multifaceted topic often veiled in negative assumptions. To start the discussion on neutral ground, analogies provide a

way to understand and imagine new information better.³¹ When looking into analogies offered for data, I came across Legos and water, first explaining the ways data can be sorted and analyzed to build new insights and water analogy opening up themes like data accessibility, ownership, and quality.

Imagining Data Analytics with Legos:

An intimidating topic made comprehensible by imagining data points as lego pieces. Similar to building a lego model, the first step in analytics is to break things into pieces. Next, it's important to sort the pieces into patterns and organize them based on some attributes, color, and shape for legos. Finally, it's time to put a model together until trial and error lead to the most realistic outcome.³² This analogy works well for explaining the basics of what can be done with data without triggering the questions about data governance.

Data Governance Based on Water:

However, data governance, the accessibility, availability, usability, integrity, and security of data is managed, is also an equally important part of the topic of personal data. Water is a great analogy here as it is easy to imagine continuous streams of data flowing around us like a data ocean. And managing the planet's water has similar requirements to managing our data—it has become a necessity and has to be accessible, clean, and

high quality.³³ Similarly to water, some agents have the power to make data flow in a certain direction, to pool it into a reservoir for their needs. The water analogy allows for a new angle in the discussion of who owns and who controls the data in an easily graspable way.

→ Prototyping

To embrace the iterative discovery process of the double diamond, I wanted to co-create the design solution with my target group. For that, I facilitated two workshops and made changes to my design concept after each one. I had the role of guiding the discussion and the participants had a chance to voice their opinions and give feedback on the process during and after the experience.

Prototyping workshops

	Goal	Participants	Duration	Findings
Workshop 1	Proposing my workshop idea, testing it, and getting feedback	2 people who had finished high school the previous year	2 hours	<p>Experience for participants:</p> <ol style="list-style-type: none"> 1. Group work was suggested to get more creative results 2. Analogies work, they simplify the topic and accommodate creative thinking 3. Make the workshop shorter 4. Improve visual design so that each participant would have space for their creations. <p>Experience for the facilitator:</p> <ol style="list-style-type: none"> 1. Reassurance that participants don't have to have the "right" answers 2. Allow more discussion on data management and regulation based on the water analogy 3. Open the topic more in the intro to onboard participants.
Workshop 2	Testing the game and iterations made based on Workshop 1 key takeaways	2 high school students graduating that year	1,5 hours	<p>Experience for participants:</p> <ol style="list-style-type: none"> 1. The form of the game is a welcomed alternative to the regular class format 2. Less facilitation was proposed so that the game would suit class format better — have both independent work and discussion 3. The visuals created excitement and anticipation <p>Experience for the facilitator:</p> <ol style="list-style-type: none"> 1. Fine-tune task descriptions and time limits for a smooth experience 2. Provide additional guidance if a participant does not understand the concept of personal data 3. Point of view statement helped to reach a more tangible outcome for the game

Figure 20. Prototyping workshop structure and main findings.

As I stated in the ideation takeaways, I wanted to design a way for high school students to form an opinion on the topic of personal data, not provide a tool for managing personal data that was largely the direction offered by ideation workshop participants. This made me see the workshop as a medium on its own and start prototyping it as a design concept on its own.

The workshop format would also align with the participatory approach I wanted to take in my design process. Furthermore, interweaving co-design into the concept would allow it to evolve together with the students and give the students to power to explore what is relevant to them on the topic.

I completed two rounds of prototyping to come up with the design concept for a game where the analogy-based environment helps students build their independent point of view on personal data use. Below is an overview of the prototyping workshops, their goals, participants, and findings to bring to the next design phase.

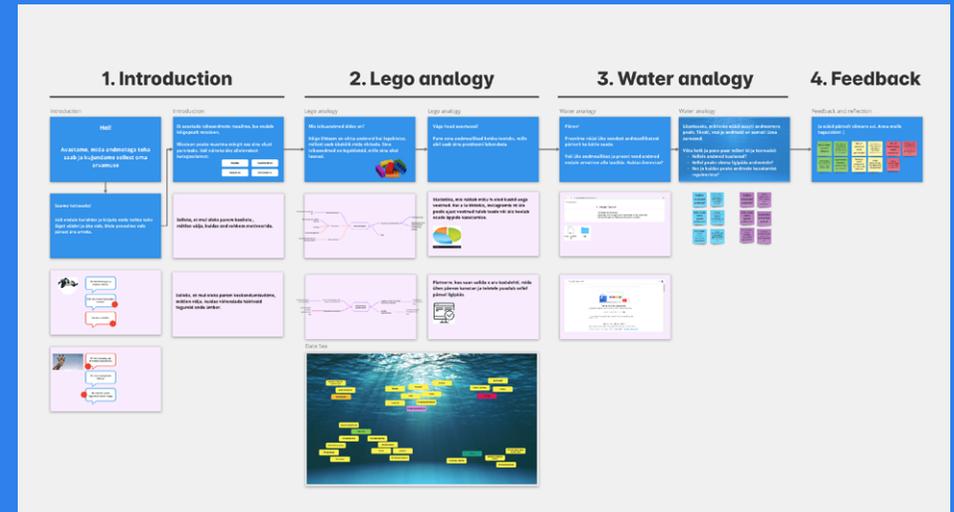


Figure 21. First iteration—the workshop.

→ **First iteration: The Workshop—learning about personal data and how it’s being used**

After discovering analogies about data, I wanted to bring both of them in as together they cover both a basic knowledge of how data can be used to come up with new insights and also how data as a resource should be managed. This allows to start from a very zoomed-in view and end up in a more abstract and systematic discussion. I wanted the students to be able to participate in creating their learning experience and allow them to learn by doing. For the prototype, I used the Miro platform that enabled me to create a journey of the workshop tasks and for me and the participants to fill out the tasks simultaneously.

Below I have outlined each part of the workshop, what I wanted to test with it and the results I had.

1. Introduction

Goal: Onboarding participants to the topic and the platform

Exercises: Warmup exercise “two truths and a lie” to introduce participants to each other and have them use some of the features of the platform to get used to it. Next, participants set a mission for the workshop. To personalize the learning experience

for each participant, I asked them to think of an area of their life they would like to better and form a mission statement we would seek a solution for by using their data.

Testing goal: Testing personalization’s impact on participation

Results: Both from my observations and the participant’s feedback, the introduction part served its purpose of getting used to the platform and the tonality of the workshop. The participants felt that the topic of personal data was not brought in enough, though and they only grasped what’s going to happen later on.

2. Learning about personal data through the Lego analogy

Goal: Participants demonstrate an understanding of how data-based insight building works by coming up with an example.

Exercises: After being introduced to the Lego analogy for data, the participants had to start their solution diagram by stating the focus of the problem they set out to solve by themselves. Then, they had to break the problem up and state the pieces it consisted of. To find some data evidence to analyze the problem, the participants were introduced to different categories

ries of personal data there is about them and were asked to choose categories relevant to their problem. Finally, to frame their potential insight, the participants had to come up with a suggestion of a product that would solve their problem and explain what sort of data it would need to work.

Testing goal: See how well do participants understand the topic after hearing the analogy.

Results: Both participants found the lego analogy easy to understand. Their solution diagrams reflected that as well as they filled it out correctly by only looking for evidence from data categories, not other plausible causes that do not leave a data trace.

3. Learning about data governance through the water analogy

Goal: Put together a point of view on the topic by thinking about it in context.

Exercises: Framed as taking the first step on making the product they came up with reality, the participants had to choose one data category necessary for the product, try to find the data and download it to their computer. To reflect on the process, participants were asked to take screenshots of

during their journey. I introduced the water metaphor and asked the participants to write down their thoughts on the following questions: Who owns data? Who should have access to data? Who should regulate data use and how?

Testing goal: Form a point of view by reflecting on the experience of trying to access data.

Results: The process of downloading their data was quite difficult for the participants as the platforms holding it had some hurdles like having to wait several days before being able to download. One of them actually managed to download their location data but said that the way the data was presented in an HTML file made no sense to them and they didn't want to open it.

The water analogy and the point of view forming questions introduced at the last part of the workshop didn't spark discussion. The reason might be that participants felt the workshop was too long or that they were unsure about the answers as this was the first time they were learning about this topic. Also, just writing down answers and discussing them with a group seemed not to be tangible enough for the exercise to have a solid outcome.

4. Reflection and feedback

Goal: Specify the necessary changes for the next iteration.

Exercises: For participant feedback, I used the start, stop, continue method. The participants could share what they think was missing from the workshop, what think could be changed, and what they liked. I also analyzed the workshop afterward and wrote down my reflections as a facilitator.

Results: Overall, the workshop was a success. The participants were very eager to learn about their personal data as they had come across some information before, but not enough to really understand it. The participants liked the playful aspect of the workshop and appreciated how easy the analogies made the topic to understand. After overcoming the initial pressure of having to decide on a mission, they found investigating their own problem interesting and helpful in even a broader context broader than personal data. To remove some of the pressure, doing the exercises in groups was suggested. Also, emphasizing not having to come up with the “right” answers could take some of the pressure off.

The analogies helped the participants to grasp how data works and imagine some of the bigger picture questions about

managing it as well. The water analogy, though, needs to be explained better and the exercise a tangible outcome for closure.

However, they expressed feeling a little lost in the beginning and would have appreciated more of an introduction to the topic. For the flow of the experience, the workshop should be shorter to keep up creative energy and fit into the school schedule.

As for the visual and interactive part of the workshop, the layout of the exercises should create a space for each participant so that they could see what they did in the last step and use that knowledge in the next one. Also, having an overview of their journey could help them with coming up with their point of view in the end.

→ Second iteration: The game

I was really inspired by the feedback from the workshop about how the participants enjoyed the playfulness of the experience. I saw the potential of putting together a game where students were explorers in an environment enriched with analogies to help them build their independent point of view on personal data use.

Although the exercises the participants had to complete to reach the goal of forming their point of view were the same, I added some components that would make steps for reaching that clearer. I was able to incorporate everything into the new prototype but the group work.

Game setup based on feedback gathered from the workshop:

1. Playfulness

The gameboard consists of the data sea in the middle of the board where the personal data categories float. It is surrounded by a starry sky where the constellations represent the insights that can be made by connecting different data dots.

As soon as the participants arrived at the platform, they started exploring the map which I see as a positive sign that the gameboard is engaging. From the participants' feedback, the gameboard also allowed for a smooth journey throughout the exercises with the only downside being that the task descriptions were listed on the right side of the gameboard and therefore a little bit hard to access. This can be addressed in the final prototype of the game when a clickable prototype can be used instead of the Miro platform to accommodate accessible-task descriptions.

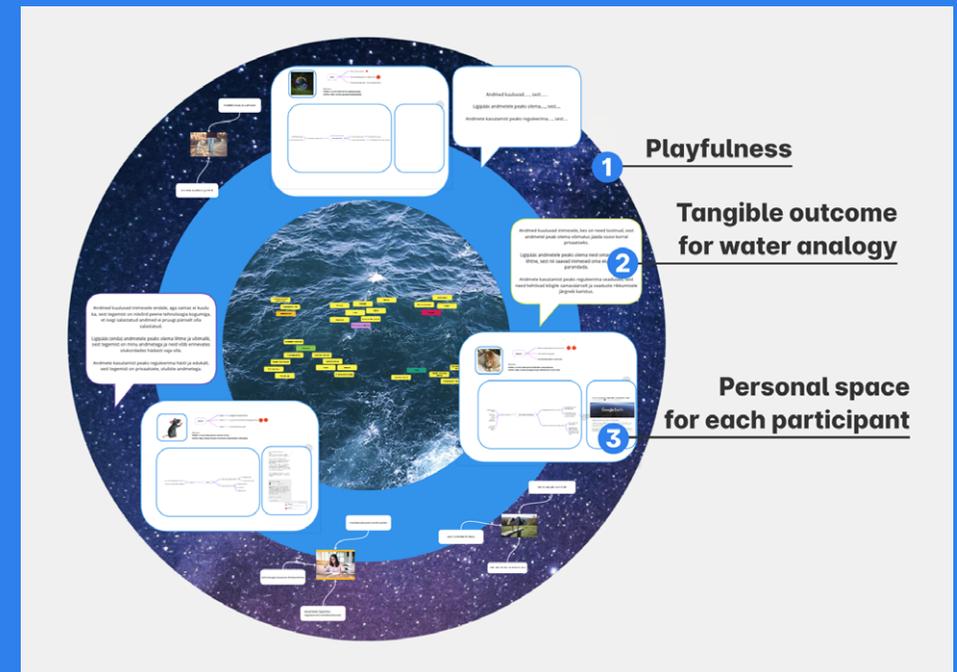


Figure 22. Second iteration—the game.

2. The tangible outcome for the water analogy exercise

To encourage more exploration in the water analogy exercise to put together a point of view, I introduced a text bubble with prompts to help participants form their statements. For filling it out, the participants were encouraged to look for any additional information on the topic they could find and note what they would like to further research. For the discussion, participants had to choose a border color for the bubble to indicate where on the spectrum of positive to negative their opinion lies. This would allow to quickly assess the variety of opinions of the participants.

The tonality indication with the border color really improved the discussion as the points brought out in the point of view statement were similar, but one saw them as positive as the other wasn't convinced. This opened up the emotional side of the topic where one participant expressed hope for innovation whilst the other was more concerned for their privacy.

3. A space for each participant

This time each participant had a card to fill out as opposed to each task having a separate card as in the workshop. The card held the basis of their exploration—their mission statement,

problem mapping, and results of trying to access their data. Their deliverables, the product to solve their problem, and their point of view statement float around the card.

This setup encouraged traveling around the board to see what others are creating. Whilst the task descriptions being too far away from the card was seen as a thing to improve, the participants could point to different elements in their journey when explaining their conclusions.

4. No “right” answers

In addition to emphasizing there not being right answers to the exercises when introducing the tasks, the look of the game-board signals to the participants that this is a space for creation and exploration, not a test of their knowledge.

Since the topic didn't come up in the feedback session this time, I think the changes resolved it.

5. Reducing the workshop to 1,5h

When measuring only the time spent on the game and not introducing myself and gathering feedback afterward, the game should fit into two academic hours (2x45min). If needed, there

can be a break in the middle of the game when moving from the lego analogy to the water one.

6. Future developments

Group work. Due to this part of the project happening at the same time as the high school final examination, it was difficult to recruit enough participants for testing group work.

Introduction to the topic. This opened up questions about who will be facilitating the game. If it's a teacher, the students will already know each other, and the warmup exercise of getting to know each other could be swapped for one that introduces the topic and the interactions with the gameboard. If it is an outside facilitator, the issue remains unsolved.

→ Third iteration—finalized visuals and teacher feedback

To get teacher feedback on the game, I set up a user testing scenario and invited three teachers to go through the game. My main goal with the testing was to make sure the task descriptions were understandable and the teachers understood the purpose of the game. I created an onboarding flow for the teacher that would explain the game to them before playing it in class. I was able to recruit three teachers for the testing, but only one of them taught in high school. Still, the feedback from all of the teachers was very valuable as they helped me understand how to set up the game steps in a way understandable for students, what would the teacher require before committing to using the game in class and how would the teacher need to prepare for the class.

I implemented the feedback by improving the copy of the game steps and adding examples to each step. I used the learnings about how the teachers would have to prepare for playing the game in class to improve the game description.

Usability test

Participants		Test tasks	Findings
Teacher 1	Classroom teacher in middle school. Covers the core curriculum of literacy, mathematics, science, and social studies.	1. First I asked the teachers to go through the steps of the game and explain what the students would have to do in each step.	In addition to some copywriting improvements, teachers strongly suggested adding examples to each of the steps. This would help both the teacher in explaining the game and also guide the students in the right direction.
Teacher 2	Special education teacher in middle school. Covers the core curriculum of literacy, mathematics, science, and social studies for students with learning difficulties.	2. After completing the game, I asked the teachers to describe the purpose of the game in their own words.	The teachers understood that the purpose of the game was to learn about the variety of information that is shared with companies through personal data. The end goal of forming an opinion about the subject needed more explanation though.
		3. Finally, I asked the teachers how they would arrange to play this game in class.	The teachers thought the game could be played both in school and remotely. The students would need to be divided into groups and in school, each team would need a computer or a tablet and the teacher would share the game also on a bigger screen. They appreciated the discussion opportunities after each step and stated these as the main value of the game. Even though the game doesn't need additional resources to play it, one teacher said it would be nice to have a list of articles or materials she could direct the students to for additional reading.

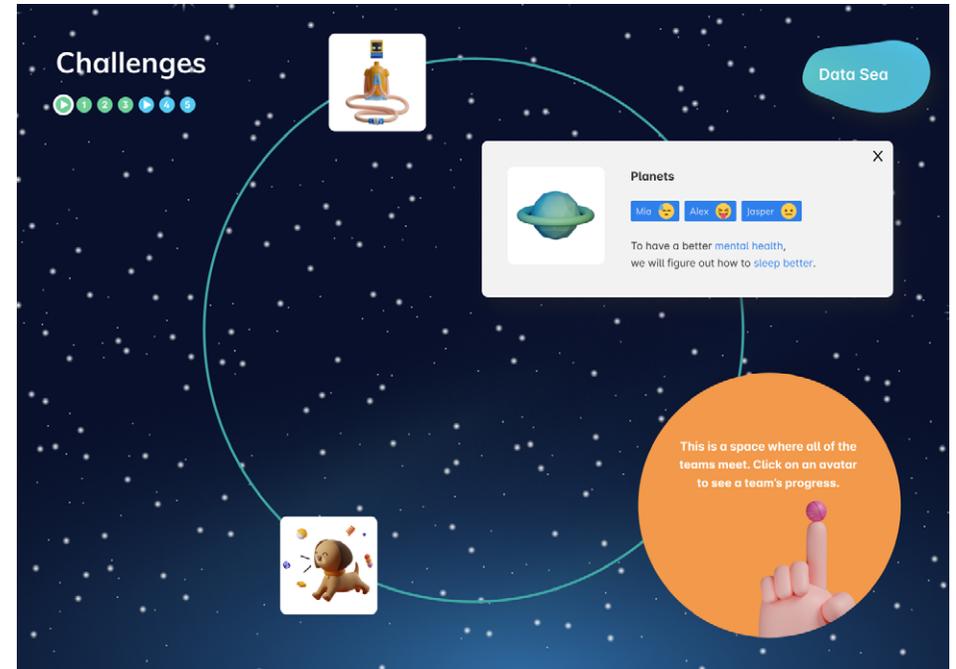
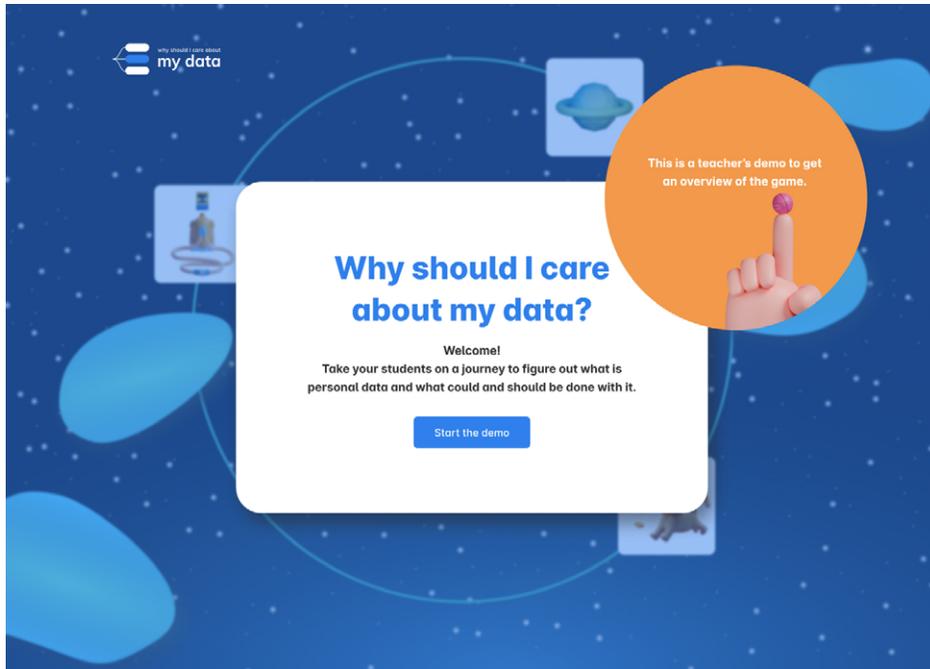


Figure 23. Screens from the teacher onboarding flow.

6. Design Solution Proposal

6.1 Design Concept

Why should I care about my data? is an online game with the goal of forming a point of view on the topic of personal data. It is designed to be played in class with high school students in mind.

→ [Link to the prototype](#)

→ [Link to video \(will be added in June\)](#)

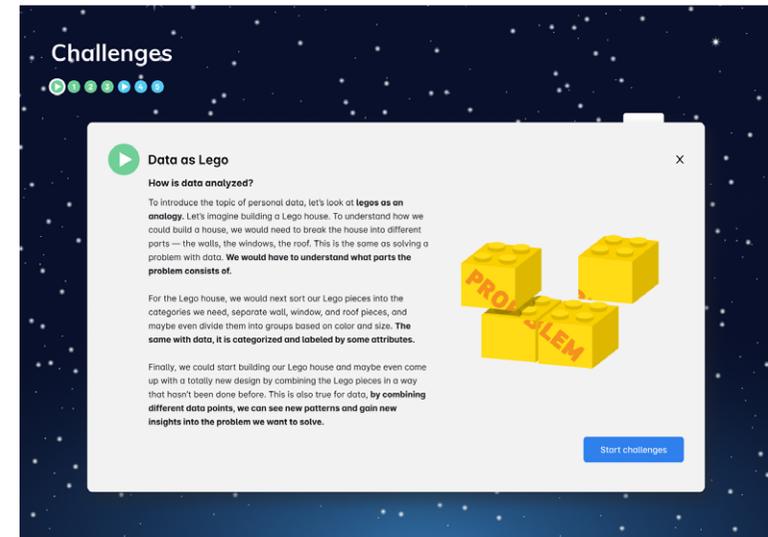
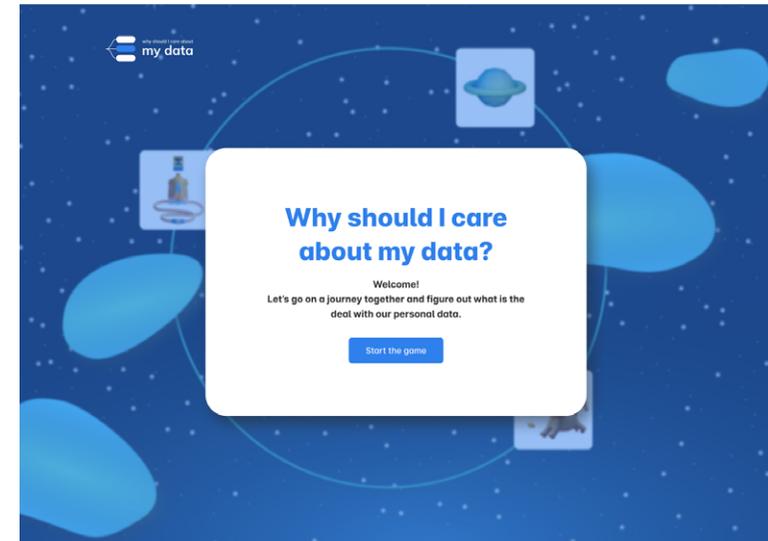


Figure 24. Screens of the game.

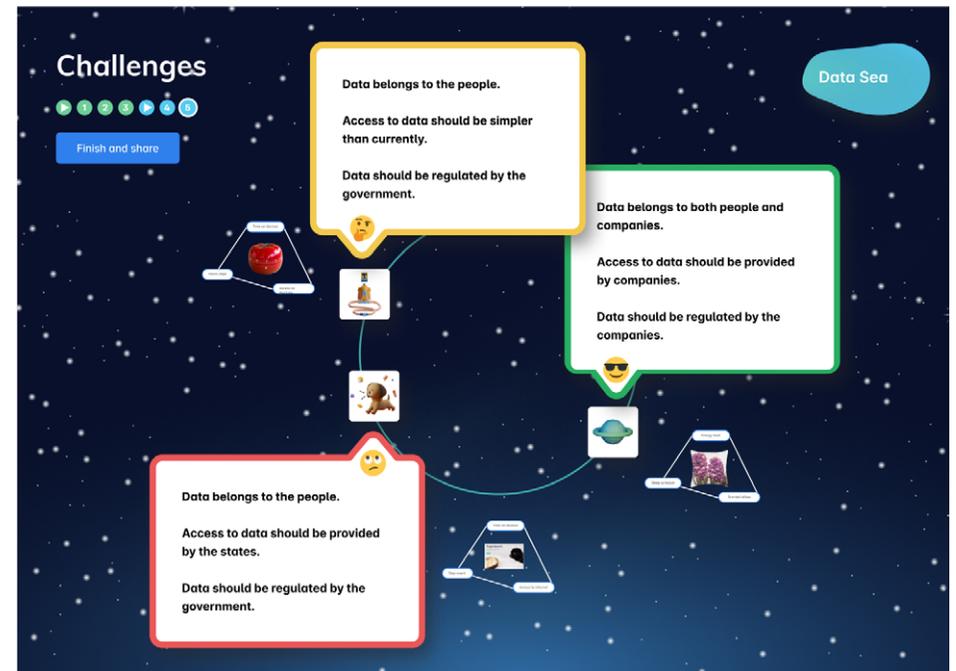
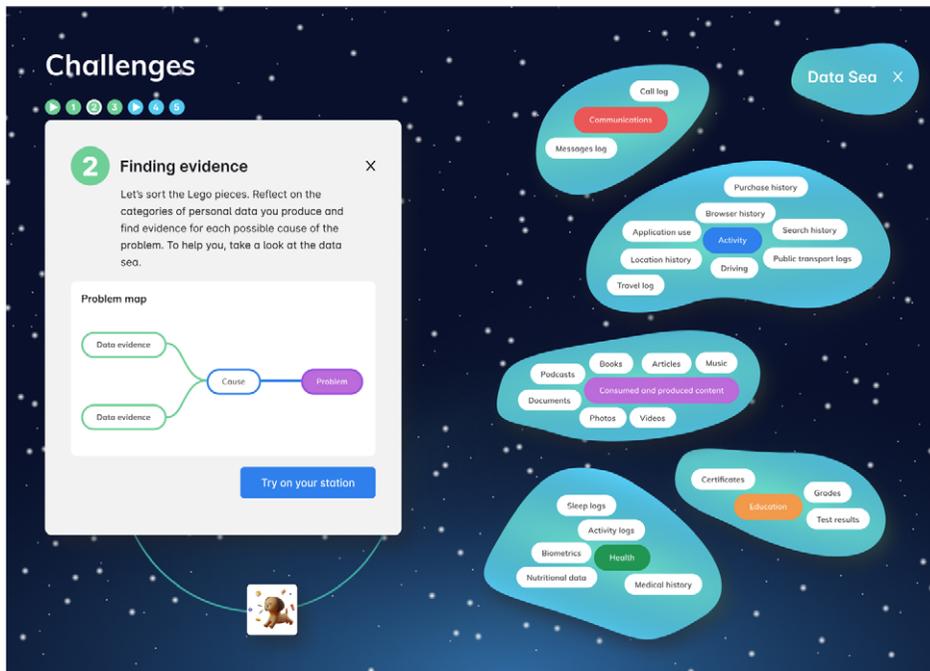


Figure 24. Screens of the game.

→ **Game description**

Why should I care about my data? is played online and facilitated by the teacher. One of the main events in the game is for the participants to actually attempt to find and download their personal data. The online game allows for seamlessly sharing that journey with other teams through the collaborative space. Also, the online interface makes it possible to adapt the game based on whether the participants play it in the same physical space or come together remotely due to the current pandemic situation or for collaboration with other schools.

The teacher’s main role in the game is to facilitate discussion. The exercise descriptions are provided by the game, the teacher’s task is to make sure each team could share their thought process and creations after each step. The teacher isn’t required to have previous knowledge on the topic of personal data but should be able to find additional resources on the questions that arise during the discussion if needed.

In order to play the game in class, the teacher and at least each of the teams would need either a computer or a tablet. If possible, it would help if the teacher can share the game on a bigger screen. When playing remotely, each participant would need access to a computer or a tablet and also a conference call platform like Zoom or Google Meets.

Game overview

Purpose of the game	Help students form an opinion about how their personal data should be used.
Activities in the game	<ul style="list-style-type: none"> -Learning about data analytics and data governance through analogies. -Coming up with a solution to one of their problems in life using their personal data. Trying to download their actual data to see how to access it. -Forming an opinion on the topic based on their experience of the game. -Discussions throughout the game with fellow students.
Game duration	Completing the game takes 1,5 hours or a double period class. The game can be divided into two classes.
Learnings in class	<ul style="list-style-type: none"> -Understanding main terms related to personal data. -Forming an opinion on the topic through discussion with other students.

Figure 25. Game purpose, activities, duration and learnings.

Steps of the game

→ Warm up

Checking in. To get players to focus on the game and leave the rest of the day behind, the warmup exercise is choosing a team name, avatar and stating the emotions of the team members. This serves two purposes: getting used to the game interface and getting in touch with how participants feel.

Setting a mission. To personalize the game experience, the teams should set a mission close to their hearts. This will guide them through the following exercises and they will have the context to navigate the following exercises.

→ How is data analyzed?

Lego analogy. To introduce the topic of personal data, let's look at legos as an analogy. Let's imagine building a lego house. To understand how we could build a house, we would need to break the house into different parts—the walls, the windows, the roof. This is the same as solving a problem with data. We would have to understand what parts the problem consists of. For the lego house, we would next sort our lego pieces into the categories we need, separate wall, window, and roof pieces,

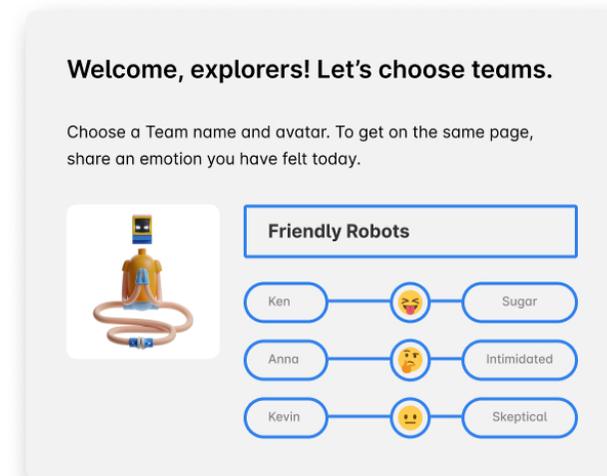


Figure 26. Game. Warm up. Checking in exercise.

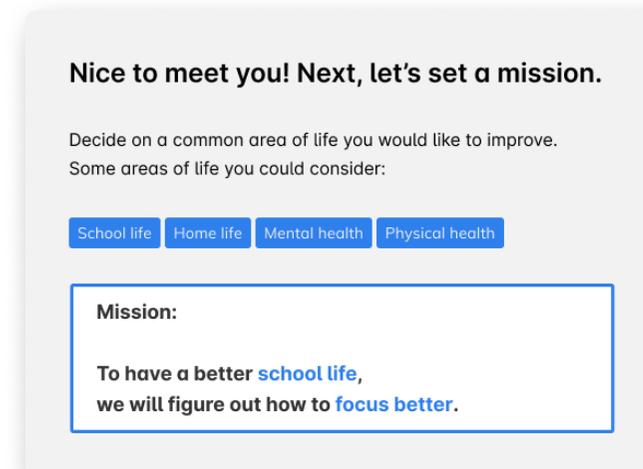


Figure 27. Game. Warm up. Setting a mission.

and maybe even divide them into groups based on color and size. The same with data, it is categorized and labeled by some attributes. Finally, we could start building our lego house and maybe even come up with a totally new design by combining the lego pieces in a way that hasn't been done before. This is also true for data, by combining different data points, we can see new patterns and gain new insights into the problem we want to solve.

The goal of the lego analogy is to introduce the topic in a graspable and non-intimidating way. Let the participants form an understanding based on something they already understand. The simplicity of the explanation is fine as the goal is just to introduce the topic to spark interest and thoughts not gain a deep understanding.

1. Breaking the problem down

This is a practical exercise based on the lego analogy. The participants have to start solving the mission they set for themselves by completing the first stage of the lego analogy—breaking the problem into pieces that might be causing it.

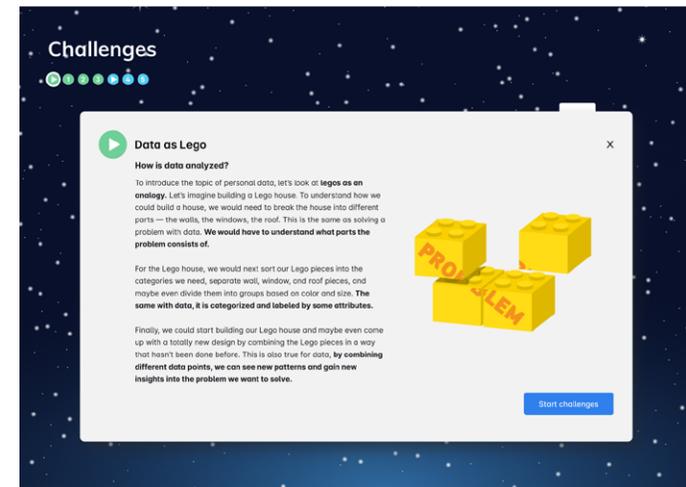


Figure 28. Game. How is data analyzed. Lego analogy.

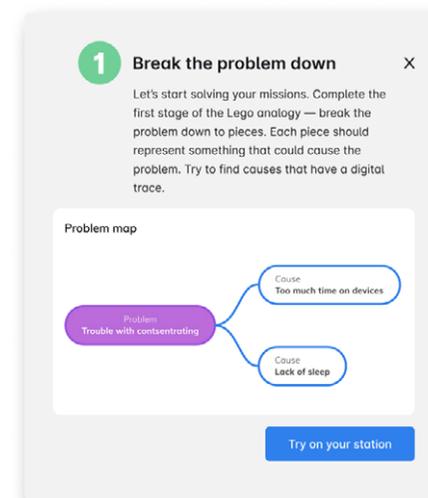


Figure 29. Game. How is data analyzed. Breaking the problem down.

2. Finding evidence

Next, participants can reflect on the categories of personal data they produce and find evidence for each possible cause. To help them, they have examples in the Data Sea which they use as a guide for data categories. This step introduces them to personal data categories and gets them reflecting on the data they create.

3. Creating a product

This is the third phase of the lego analogy. Creating a solution for the problem set in the mission from the data we have about it. This sparks creativity in participants and makes them think of how they could practically use their personal data to create a useful tool for themselves.

→ How is data managed?

4. Trying to download data

As an introduction to the data governance part of the game, the participants have to go on a quest to actually download some of the data they would need for their product. This takes the

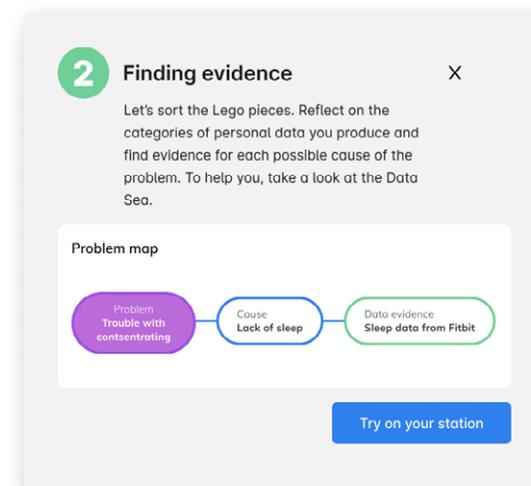


Figure 30. Game. How is data analyzed. Finding evidence.

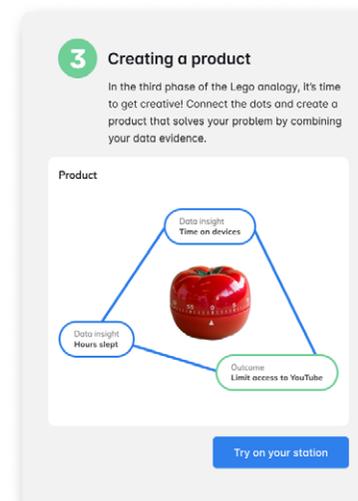


Figure 31. Game. How is data analyzed. Creating a product from the data insights.

game into a real-world context and gives them the experience of accessing their personal data. After finishing the quest by either downloading the data or reaching a dead end, the participants have to give an evaluation of the process by assigning an emoji for it—how easy it was, how did it make them feel, what issues came up.

Water analogy. Let’s look at the Data Sea again. Data can also be compared to water, an ever-circulating substance flowing all around us. Just as water, new data is always being created and it flows from our devices to the parties that use it and in between parties as well. If we think about water, there are some important aspects to figure out to make sure water management is fair—who owns water, who makes sure clean water is accessible to everyone, who regulates how much water can be used and how. The same questions are important to answer for data, especially your personal data.

The goal of the water analogy is to invite participants to start thinking about data governance. Again, the topic is introduced in a way that the participants can imagine and therefore feel more confident in forming their opinion about it.

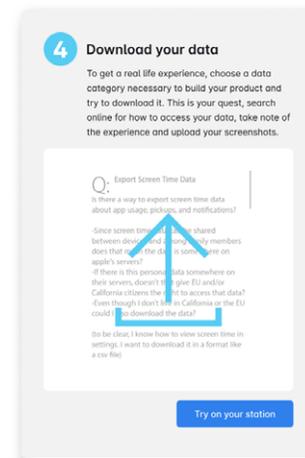


Figure 32. Game. How is data managed. Trying to download data as a building material for the product. Screenshot from Apple Community page.³⁷

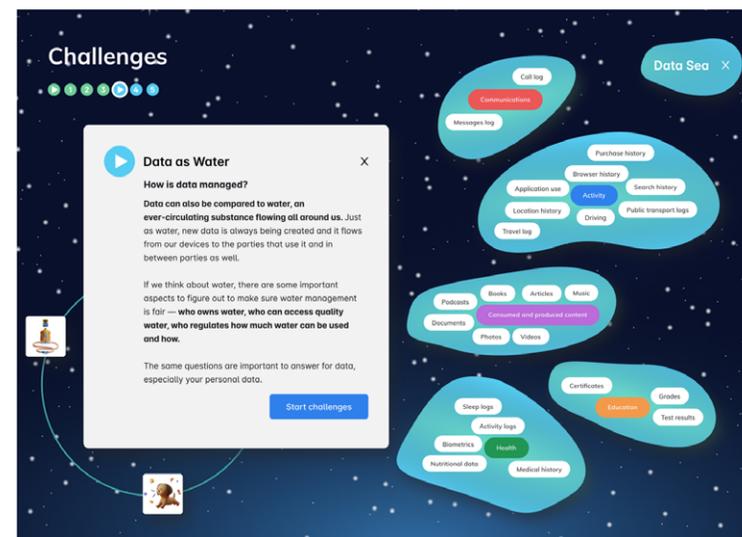


Figure 33. Game. How is data analysed. Water analogy.

5. Forming an opinion

The last step of the game is for the participants to write down their opinion on data governance. They have a prompt to help them and they are encouraged to write down what they think is right, not what is currently true. Then, they can choose where their opinion is on the positive-negative scale and introduce it to others. This allows the teacher to guide students towards resources to find out how the local policies regulate data and ground the discussion in facts. The participants can now observe the digital world they use every day from a new angle rooted in the personal experience gained from the game and be more confident in discussions when the topic of personal data use arises.

→ Discussion

During the game, it is the teacher's role to facilitate the discussion. Throughout the whole game, it's possible to visit other teams and see what has their journey been like. By the end of the game, the playfield is filled with the teams' products and point of view statements. This can be used for a concluding discussion in the class or shared with other students and schools to get a larger pool of opinions.

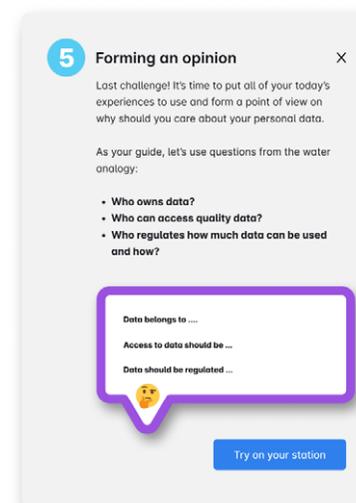


Figure 34. Game. How is data analysed. Forming an opinion.



Figure 35. Game. End of the game. Participants' products and point of view statements.

6.2 Evaluation of the Process and the Final Design

I am very happy with the project. My breakthrough moment came when conducting the first workshop with high school students. Seeing my idea in the hands of real students prompting them to explore and share their experience-rooted thoughts made me realize the value of my work. The process I chose to follow worked out great. I started from a space of curiosity, embraced the ambiguity when familiarising myself with the topic with desktop research and expert interviews. The part I am most happy with is the user research as it pulled me out of a lot of assumptions and helped me root my design solution in the needs of real people.

As for the design concept, during the process, I evaluated how well does the design solution solve my design challenge and does it align with my design principles. My design challenge was framed with the question “How might high school students use their personal data in a perspective broader than company profit?” In the workshops, students were invited to come up with products that could help solve some issues in their life, therefore seeing personal data in a context larger than company profit or targeted advertising.

Also, I believe the design concept aligns with my Design Principles.

Create a relevant experience in the European context

As students can gain personal experience in the game, they will discuss the topic of personal data from their own point of view.

Allow implementing immediately

After some additional development brought out in the Future Developments selection, the game is ready to use in classrooms and participants can discuss the topic in today’s context.

Initiate discussion and make room for different opinions

The testing showed that students don’t reach the same conclusions and end up having different opinions on how personal data should be used and managed. The game allows for each opinion to be shared.

Bring clarity to how personal data can be used

Using analogies to explain the topic, students learn both how data is analyzed and what is important when managing it. This allows them to think beyond their current knowledge and see new opportunities for how they could benefit from their data.

7. Reflection

7.1 How the Design Concept Fits the Current State of the Art

I believe the proposed design concept is a tool to start a discussion about personal data and its uses in schools. The game facilitates both students and teachers, allowing both sides to explore the topic without being intimidating and holding space for different opinions. Figuring out how we should use and protect personal data ever more important and I see this game empowering you people to think about what their personal data could do for them, not only see it as a tool used to manipulate them.

7.2 Future Work

→ Testing in a classroom environment

Even though I tested my idea with students, I never got to play the game in a classroom environment with the teacher facilitating the game. I think this would give extremely valuable insights into the game structure as well as the digital interface.

Also, the classroom environment brings up the need for a physical interface. Currently, in the time of the Covid-19 pandemic, it makes a lot of sense to have a digital interface but when students return to classrooms, a hybrid form of the game could be useful to allow for digital information gathering but physical presentation.

→ Building levels for different target groups

As education in digital subjects such as programming and informatics develops and states have a bigger interest in getting this knowledge to students earlier, the game could use some adaptations for primary and secondary school students as well.

8. Summary

I started this project from a state of curiosity. Without having a particular background in data analytics, I was intrigued by what I learned from the Social Dilemma and how I was not aware of the information before, even though I design digital experiences every day as a User Experience Designer.

I dove right in and through desk research, I started exploring the world of personal data. I soon found myself quite overwhelmed by the opportunities, but talking to experts helped me to narrow down to focus on people's relationships with their personal data. The part I am most proud of and thankful for is my User Research chapter. Talking to real people really grounded me and helped me reach an aha moment—the content people currently have on personal data, doesn't resonate with them as it addresses the extremes and is from a different cultural background. Here I saw a real opportunity to contribute as a designer and help to facilitate the discussion in the European context.

I decided to focus on high school students, as it would be possible to reach them through school and they could bene-

fit from the learnings as they are the future developers of our policies. I included 4 wonderful students in my design concept development process and with their help, I created a playful way of forming an opinion on a new topic. It was very important for me not to design something for people who already have a certain mindset, for example valuing their online privacy above all, but rather design a way for people to reach their own independent mindset.

Why should I care about my data? is a game that uses two analogies, legos and water, to introduce data analytics and governance. The students playing it can curate their personal journey through the game by choosing a real problem in their lives they would like to solve. They have an opportunity to see how having access to their personal data could help them solve that problem.

Based on evaluating the design concept against my design principles, the feedback I got from the students and my mentors, I feel that it is a great outcome of this project. It takes a rather hopeful outlook on the topic and it sparked new ideas in the players, leading me to hope that educating people on the topic of personal data would lead to a much more proactive relationship with one's data, where individuals see their data as a tangible resource that should be handled carefully and that they themselves can also benefit from.

9. Credits

I had a lot of support during this project by truly inspiring people who are honestly the smartest people I have ever met.

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