# Reflection

Elective – DMB160 Data-enabled Design – Q1.4

The course Data-enabled Design was part of the second semester of my first year, of the master program Industrial Design. My other activity during this semester was project M1.2 Design Research. This was my first time working with the Data-enabled Design (DED) approach, which changed my perspective on data use in design: instead of viewing data as something to validate or simply feed to a design, I realized how data could creatively influence the design-process itself. As mentioned in my Personal Development Plan (PDP), I had some prior experience with data through UX related courses and projects. In those projects however, data never acted as a creative driver. During this course, I had to stay mindful not to fall back into these patterns, but get the hang of a different way of working allowing data to have a more dominant and different character in the design-process.

The personal goals I set for this course were to improve my probe-building skills and contextual awareness, strengthen my data-communication skills through visualization, and exploring data as a creative driver in the design process. The team assignment of the course explored the topic 'social media usage', which evolved to the broader scope of 'smartphone usage'. In this reflection, I will revisit these goals and discuss the insights I gained throughout the course. I will also reflect on the 12 Data-enabled Design principles (figure 1), referring to them where relevant. Finally, I will reflect on my contribution to the team and our collaborative process.

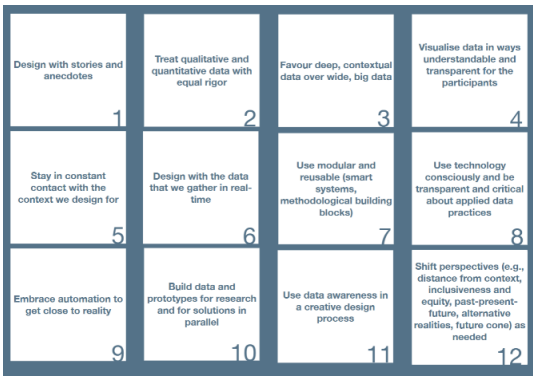


*Figure 1. Design Principles as introduced by the course in one of the lectures.*

## 1. Improving probe-building skills & contextual awareness

Before this course, I had a basic understanding of electronics, but often felt insecure when applying this in projects. This was often a limitation that heavily influenced my design-process, my insecurity left me simply no room for experimenting with prototypes. During this course, I therefore tried to actively engage with both the hardware and the software of probe development.

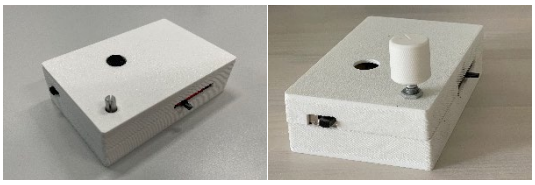

*Figure 2. Probe evaluation from 2nd (left) to 3rd (right) iteration. Many of the changes are 'invisible' as they involved the electronics inside and the coding.*

For example, during the third iteration I worked together with a team-member who was focusing on the probe-design. Together we came up with the final set-up of the electronics and the code for the probe. They had a more leading role, as I had more experience with Arduino, but no prior experience with the ESP32 we were ought to use during the project. We managed to implement an automatic survey in the code, which was sent whenever the participant had interacted with the probe. Creating a real-time feedback moment from participant to user (Principle 9).

This whole experience greatly helped me to get out of this negative spiral thinking I could not build anything. It also helped that another member of the team build a modular and reusable 3D-printed design casing for the electronics. This made me see that it is easier to experiment more with prototypes if there is a modular and reusable (Principle 7) basis, which could be easily adapted to explore other aspects of the context or reuse a prototype giving it a different functionality. Being one of my take-away insights for future projects.

This course also asked for a deeper understanding of 'how' a probe should be build. The starting point was the context the probe would be placed in and considering data-points that were relevant and ethical to gather in this particular context. It was interesting to see, that even though my M1.2 project had a similar topic (*'desired relationships with modern technology like smartphones'*), the approach was completely different. Research was still the basis, but probes were immediately part of that research by focusing on what data would be relevant to gather and discuss.

Additionally, the short iteration loops cycles in the design-process taught me to be more sensitive to how participants interacted with a probe in everyday life and in our case: the home environment. While designing together in the team or individually brainstormed, I used an empathic approach to shift my perspective (Principle 12) between imagining being a participant, being a data-plumber or designer. This helped prevent some foreseeable mistakes, but not all. In the first iteration the team learned that asking participants to press a 'realization button' to indicate realizing unintended use of their phone, disrupted their natural routines and resulted in unreliable data. This inspired to enter a new design loop and make appropriate adaptations to the prototype instantly and showing me the value of being in constant contact with the context (Principle 5).

## 2. Improving data communication through visualisation

Relating this back to my professional identity and vision, I believe that results from research should be insightful, but also accessible and understandable. In my eyes, this is equally relevant for participants involved in a study, as for the readers of a research paper. The project executed during this course included two 'big' moments in which participants were presented with their own data. One of these moments was during the third probe iteration, visualizing emotional state and phone use patterns using the data-points from the probe. Although the graphs and tables were created by team members, I can reflect on the way they had chosen to represent the data.

For instance, the graphs representing data about mood and phone usage were clear to me as (an involved) researcher. However, I doubted whether the 'delta emotion' as unit was comprehensible for an outsider. Even so, the involved participant indicated during the data-interview that they recognized their pattern in the graphs. Teaching me that perhaps participants should also not be underestimated and a dare-to-ask approach can surprise.

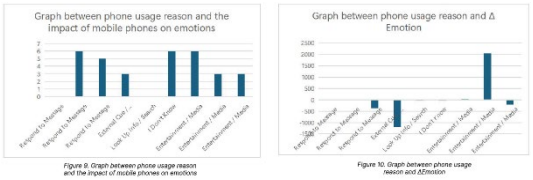


*Figure 3. Screenshot from the team pictorial page 5, graphs representing data about mood and usage.*

The other moment was the data-physicalisation of the intervention design '*IntenTree'* created in the informed exploration. The branch itself became the data visualisation. The choice of leaves and flowers, varying in size and colour, allowed participants to externalise their phone use in a meaningful way for them. The tangible design and interaction with their data supported emotional reflection while avoiding judgement. Clearly, visualisation does not always have to be literal data representation. When dealing with subjective data, like emotional content, it can even be more valuable to create an open-ended visualization. Protecting privacy of the participant, while also being transparent about what is represented. In both these cases I learned how data visualization could be understandable and transparent (Principle 4) in different ways.

Finally, intentionally creating a data-set of qualitative and quantitative data helped me understand the importance of giving both equal weight (Principle 2). Especially important when designing for behaviour, as objective and subjective data often interact, but there could also be a gap between perceived and actual behaviour.

## 3. Exploring data as a creative driver in the design process

As said in the introduction, I often treated data as something that comes after design decisions to validate or redesign. This course challenged me to take a different approach. The greatest example was the transition from the contextual exploration to informed exploration. Analysis of participant data revealed that phone usage in low emotional states often led to prolonged and unintentional use. This insight inspired us to come up with a new research question and it was the foundations of the design intervention '*IntenTree*'. There was an emotional nuance behind usage patterns. This felt like a clear moment where data was not a passive element, but actually supporting and inspiring design choices.

*Figure 4. Close-up photo of the final design 'IntenTree', showing leaves and flowers representing mood and usage data.*

Data awareness also had a front-row seat in the creative process (Principle 11). This was clearest when I prompted the idea of allowing participants to decide what each leaf or flower represented to them, rather than deciding for them. This supported my beliefs in supporting users' autonomy, but also helped avoid imposing external judgement on emotional data. Overall, I learned that using data as a creative driver can help find new unexpected routes for further research but also lead to unexpected ideas.

## Design principles

Not all Data-enabled-Design principles were integrated in the reflective text, so I will briefly reflect on the remaining five principles. These principles were less novel to me, but were embedded in the design-process. For example, designing with stories and anecdotes (Principle 1) is one of the elements I applied in most of my projects and designs. I have done many in-depth interviews and for instance co-design or co-creation sessions to obtain this data and design with it. For these projects I also favoured deep, contextual insights over big data (Principle 3), having a small pool of participants and emerging myself in their day-to-day life. The conscious and ethical use of technology (Principle 9) is also familiar to me, as I also study law and find fair, transparent and ethical considerations important.

The design for this project was a parallel research and solution development (Principle 10), especially the design of '*IntenTree*'. I feel like I am applying this principle in my M1.2 project as well, designing and offering a solution and researching what elements of the design are relevant to create a knowledge base for other users. It was however new to me how real-time data gathering (Principle 6) could be applied, but I found the way the survey could be connected to a microcontroller, through the platform offered in this course, to be very effective and useful. As mentioned before, this strengthened the direct connection between participant and researcher, and helped to quickly and effectively adapt prototypes. I see this as a valuable way of data-collection.

## Team 7

I joined this team after the second iteration of the project, and found everyone in the team to be very welcoming. Like many times before, I took on the role of organizer. I kept track of meeting notes, maintaining a shared Miro board, and keeping everyone on the same page. The organization supported reflecting on decisions, created cohesion in our process, and helped keeping track of applying all the design principles in the process.

Throughout the project, I collaborated with Jelle on refining the probe design, worked closely with Stefi on the tangible design elements of *'Intentree'*, and discussed data interpretation with Jiaxin. This way I could learn from others and share my own ideas and skills. Our team was supportive, committed and collaborative, but things could be a little chaotic at times. I noticed that if I was not there or did not actively organize, there was no direction within the decision-making process. I appreciated that Jelle occasionally stepped in to temporarily manage and direct the team.

I appreciated the fact that the team members of our group have various cultural and academic backgrounds. This created the type of academic atmosphere I enjoy the most, inviting different ways of thinking. These differences helped us constructively build on each other's ideas and collaborate to reach our teams' and personal goals.

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