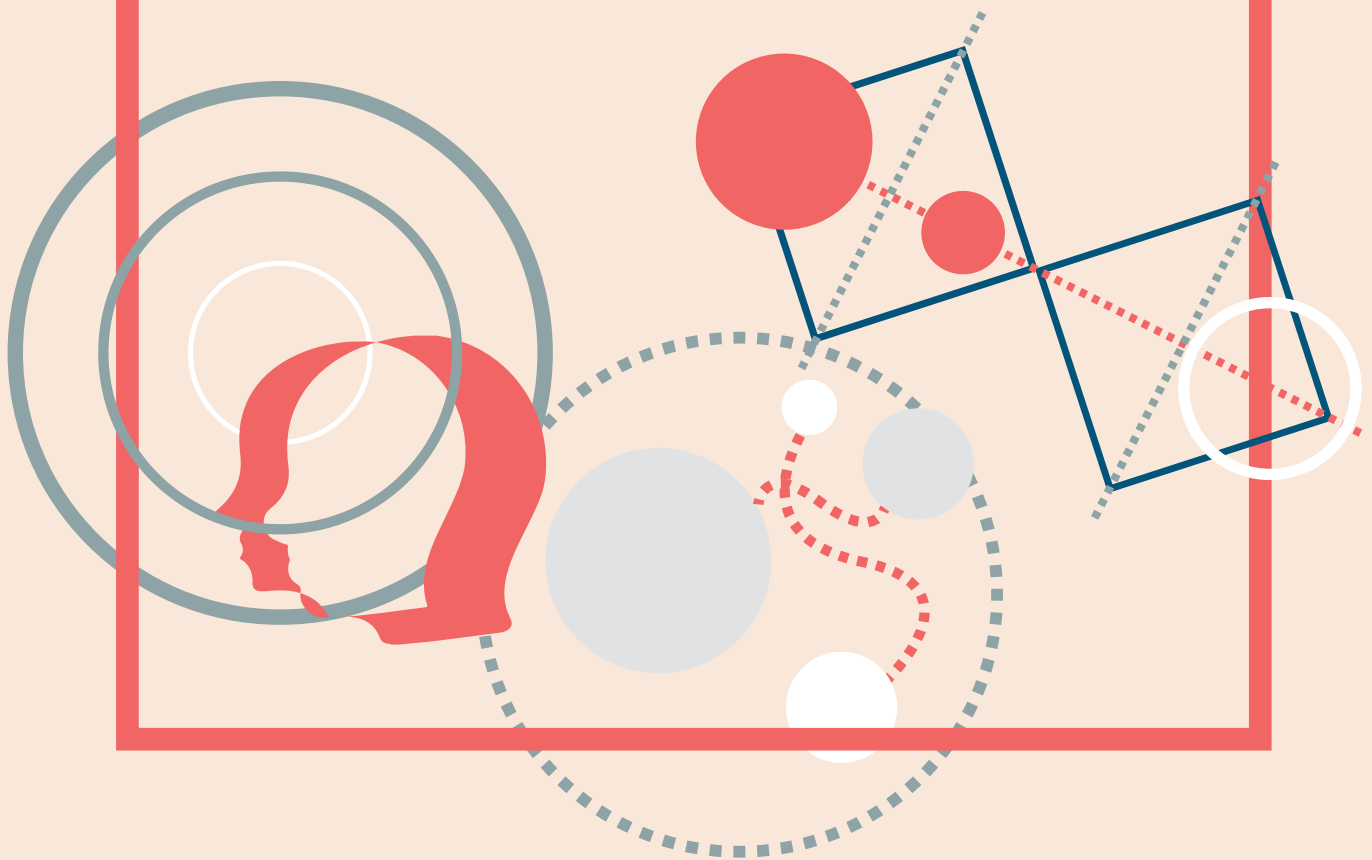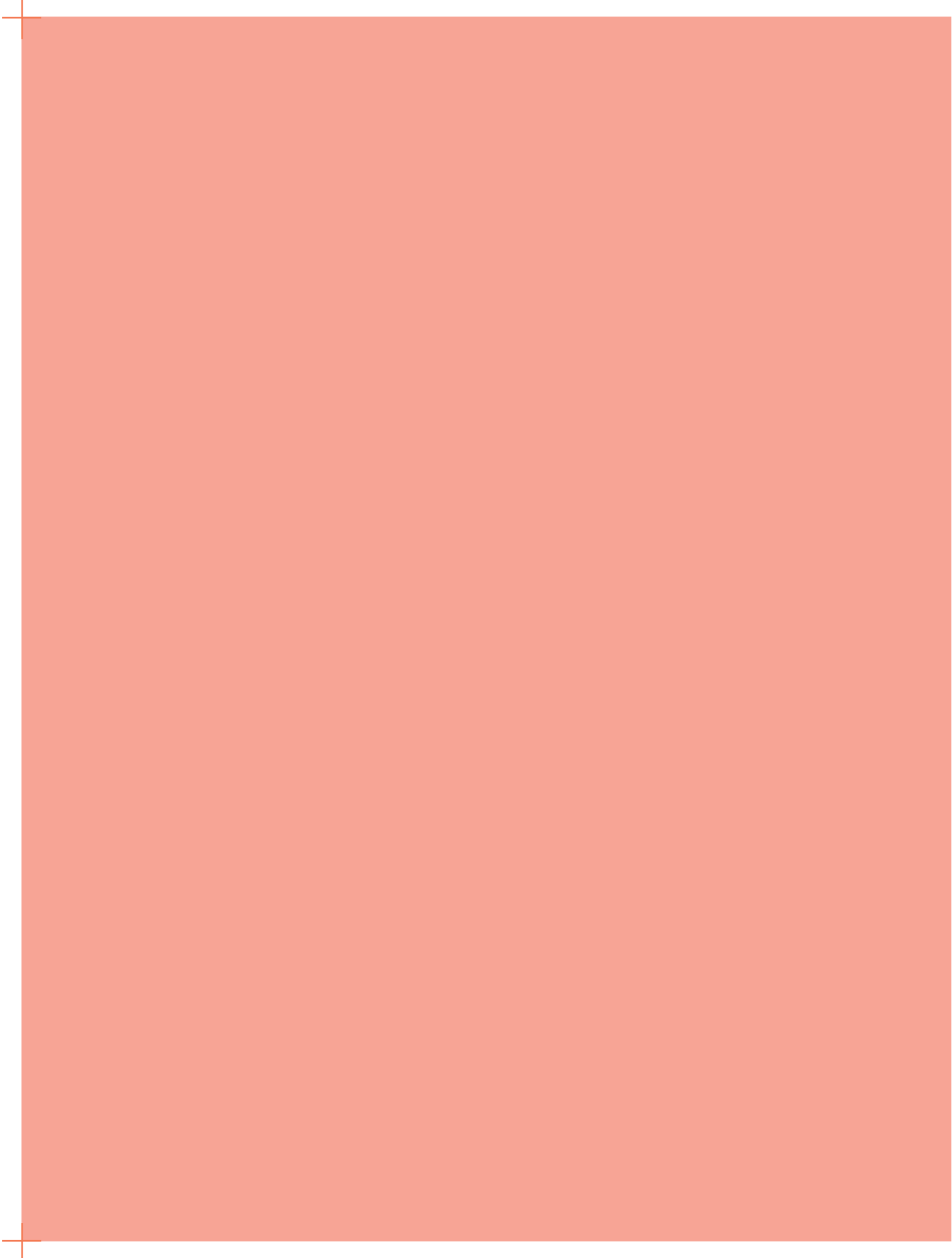# Adopting a systemic design perspective within a design thinking practice

Master thesis by **Vinodha Suresh**

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15th of September 2020
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Master Strategic Product Design

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Adopting a
systemic design
perspective within
a design thinking
practice

Master thesis by **Vinodha Suresh**
September 2020

VAN**BERLO**   x   **T**U Delft

Figure: On the way from EHV to Delft

Gratitude

This graduation thesis marks the end of a challenging ride and a very exciting start to the future! I first embarked on this project to explore and learn about the field of systemic design, an outwardly goal. And somewhere along the way, there began a journey inwards to know myself better as a designer, a professional and a human. And this twofold learning on this rollercoaster named 'my graduation project', was only made possible by all those who joined me on it. I'd like to remember these people and state that in reality, this was 'our graduation project'.

To all my mentors, Mieke, PJ and Philémonne. Thank you for showing your confidence in me to make it happen. You trusted my abilities to be able to work independently and to ask for help. I must be honest and say that before this project began, I looked up to you and admired you. And even though that hasn't changed a bit, I also now see you next to me. You channeled your strength to support me and shaped yourself as sparring partners when I needed it the most.

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To PJ, I thank you for some of the most stimulating conversations we had! I loved having you as my partner for discussion

when I was struggling through some phases in this project. Your feedback was extremely valuable and seasoned. It most certainly led my outcomes to become very rich as they are.

To Phil, If there is one thing I must take away from our time together, it would be our conversations and reflections. I consider myself very lucky to have found someone on the other side (of the screen) with whom I could resonate on so many levels! You were fierce, critical, friendly, inspiring and most of all accepting, all at the same time on some days. And I truly am grateful. I admire your passion to change the norms and to challenge assumptions, and sincerely hope to continue our collaboration together.

To my DfT colleagues, Julie, Stijn, Milou and Ivo. Thank you for introducing me to your little family and taking care of me. Even though we did not spend time together in person, every call, every advice was given and consumed whole-heartedly. I wish to be able to continue the friendship we built and explore EHV together again someday. To all of VanBerlo, thank you for having me as your intern in these strange times!

Lastly, to my partner in crime Ishit, to all of the extended family I found in my home away from home, and my real 'Suresh' family situated all around the world. Thank you for everything! An important person I was able to meet during this graduation was also my own self, for which I am grateful and excited to start the next chapter as Vino 2.0!

Executive Summary

This graduation project was a collaboration between TU Delft and VanBerlo, a strategic and product design agency based in the Netherlands. The motivation of this project was to understand how the Design for Transitions team, a part of VanBerlo, can start to apply Systemic design within their design practice. This team addresses societal and transition challenges that often present multi stakeholder, fuzzy contexts. Systemic design and its applicability in dealing with complex, multi-stakeholder, open and fuzzy problems could offer value to the DfT teams approach.

First, two explorative research questions were posed. One, was to find out how DfT conducts their design activities and what is their current design approach. This was established through interviews with DfT designers and by studying past projects. Alongside, a second exploration was conducted on the field of systemic design and a key practice in it: visualization. By studying scientific publications, exploring resources such as yearly conferences and events, theoretical knowledge on this field was established. Additionally, designers who are systemic design practitioners were interviewed to learn from their experience on how they applied this field into practice. The resulting outcome was a set of principles and practices that were evident in professional systemic design practice.

By combining insights from the two streams of explorations, four opportunity areas were determined where DfT's design process could benefit from systemic design. The opportunity areas were: Frame the brief as a complex systemic design challenge, study human insights in the form of relationships, conduct the synthesis of data and knowledge in relationships and lastly, apply visualization for sense making and sense sharing. These four opportunity areas outlined techniques, tools and methods that could be further explored.

To establish the context in which these opportunity areas could be explored, two design challenges addressed by DfT were taken up. The resulting solutions were a set of tools and templates that were informed by the opportunity areas. These solutions were applied in the design process of each of the two challenges and an evaluation could be conducted with internal designers from DfT. The resulting insights were useful to learn what solutions worked and to determine the feasibility of systemic design overall for VanBerlo.

In order to achieve the goal of the project, that is to help the DfT team apply systemic design into their practice, the revised tools and templates were gathered into a resource named The Systemic Design Toolbox. This toolbox introduced the very first steps for how DfT and the studio at large could begin to explore systemic design. Each tool is presented with a guide to illustrate what value the use of it offers, what outputs can be expected and instructions plus templates that support the use of the tool.

Overall, the outcomes of this graduation were very well received by VanBerlo and indicate promise to become the path, in not only applying systemic design, but sensitizing the studio on the changing landscape of design and the need for adopting new skills as designers.

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0.3 Goal of the project

0.4 Project approach

Figure: From my first (and only) week at VanBerlo's studio (BP - Before pandemic)

0.1 Project Scope

The larger motivation for the project was to explore how systemic design, an emerging discipline, might inform a designer in dealing with complex challenges.

As the project took shape, a more specific scope was formulated to study in what ways could this new approach to problem solving be infused within the practice of a design studio, namely that of VanBerlo. In VanBerlo, a specific team was chosen that is responsible for managing and serving the portfolio of social, health and public sector clients. This team, named Design for Transitions, deals with problems that are often fuzzy and involve multiple stakeholders working towards achieving the desired results.

As the application of systemic design has been popular in the context of complex, multi stakeholder challenges, it was considered that the work this specific team deals with could benefit from a systemic design approach.

Systemic Design
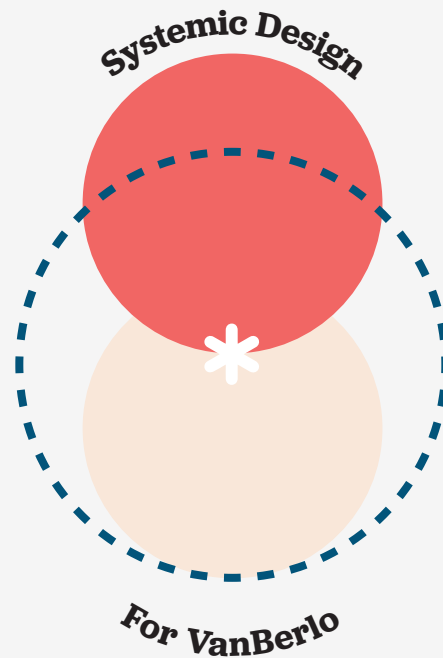
For VanBerlo

0.2 VanBerlo's
Motivation

VanBerlo is a leading strategic design and innovation agency based in the Netherlands. Established in 1982, they have matured over the past decades from a product design studio, expanding their service offerings to branding, user experience, service design, innovation performance and strategic foresight.

The development of the Design For Transitions (also referred in this report as DfT) team within VanBerlo in the very recent years has become a testimony to the growing demand of clients who are looking for ways to solve societal or transition challenges. The scope of the graduation project was to enrich the approach and toolbox of specifically this team, Dft (Design for Transitions), which currently leans on Design thinking as their key process methodology.

Compared to the studio at large that mainly executes assignments with a design output in mind (product, interfaces, brands), the work that the DfT team conducts is more strategic in nature. They offer a path towards fitting solutions in multi-stakeholder projects through their expertise in facilitation and co-creation. In their projects, they also aim to activate their clients with the capacity to change by educating them on Design thinking practices while solving for the challenge.

The client portfolio of the DfT team works with domains such as: Urban development, public services and citizen engagement.

Fitting to the DfT team's approach, the group is mainly comprised of innovation strategists and design researchers. In order to deepen their expertise to solve societal challenges, they are in the process of exploring different perspectives in the field of transition design, systems thinking and change management to improve and enhance their current service offerings.

Considering their infant stage of developing this new practice and the team's affinity towards exploratory research, problem framing and participatory approach made them a suitable case for this project to study how systemic design could be applied within their design thinking practice.

Figure Source: VanBerlo

0.3 Goal of the project

0.4 Project Approach

The goal of the project is to explore in what ways can the Design For Transitions team apply Systemic Design. Adopting this knowledge for VanBerlo was speculated to result in either a new or refined approach towards problem solving, a set of tools and methods within their design thinking model or a new service proposition for dealing with complexity, all of which draw their construct from the principles of systemic design.

On account of the DfT teams highly collaborative and co-creative approach with stakeholders, it is also important to recognize that the results could be applicable not only to enhance the designers way of working internally within the studio but also, to create new interventions that could be introduced externally with clients or other project partners. To make the outcome of this graduation more practical, the objective is to apply the new knowledge and formulate it in the context of one or more ongoing projects. This can help to determine the feasibility and viability for VanBerlo to adopt systemic design.

RESEARCH QUESTION

In order to achieve the goal of the project, the first step is to understand DfT team's design approach and how they conduct their design activities. It could also be valuable to learn about the kind of design challenges they apply their approach to, so as to determine the overall relevance for exploring systemic design. The insights gained could help narrow the scope of how systemic design could answer to the needs or opportunities found in their current design practice. Hence the first sub-research question is framed as:

> **Research Question 1**
>
> What is the Design for Transition team's design approach? How do they conduct their design activities?

The second question is formulated to explore systemic design in theory and to learn from the experience of educators and practitioners who are applying this knowledge to various distinct challenges. Exploring the perspectives of design studios can help gather insights found in similar contexts to that of VanBerlo as a design agency. Another topic that was initially expressed as an interesting direction was that of visualization within systemic design. This will be chosen as the starting subject to explore the topic. The second sub-research question is framed as:

Research Question 2

What is systemic design in theory and how is it applied by designers in practice?

By combining the knowledge from RQ1 and RQ2, the insights could help to determine how can systemic design benefit the Design for Transitions team and in what ways can they start applying it in their practice:

Goal

In what ways can the Design For Transitions team apply systemic design in their design thinking practice?

PROCESS AND APPROACH

To answer the research questions and meet the goal as defined in the previous section, certain design and research activities will be performed. The figure on the right explains the overall approach the project undertook and the corresponding chapters.

The project has been set up in the following stages: Explore, scope, design, evaluate and final design + deliver. The first phase in the project is to answer the two research questions that were formulated.

STAGE : EXPLORE

To begin exploring the Design for Transitions team's approach, the first steps will involve a short study into their methodology and past projects. Next, the designers of the team will be interviewed to learn more about how they approach design challenges and what design activities they conduct. Since the scope is an open exploration, the insights from this are expected to result in some directions (either need or opportunity) that can be further used to narrow down the focus of where and how systemic design can be applied in DfT's practice.

The second part of the explorative study looks at the field of systemic design. The topic is first explored through the lens of visualization. By conducting a literature review and studying resources such as the systemsorienteddesign.net, the theoretical knowledge will be established. Next, interviews will be conducted with

CHAPTER 01, 03

DfT's Design Approach

CHAPTER 02

Systemic Design

1 2 3 4

CHAPTER 04

Scope down to four opportunity areas

CHAPTER 05

Explore in the frame of two design challenges

CHAPTER 06

Design and evaluate solutions

CHAPTER 07

Final Outcome
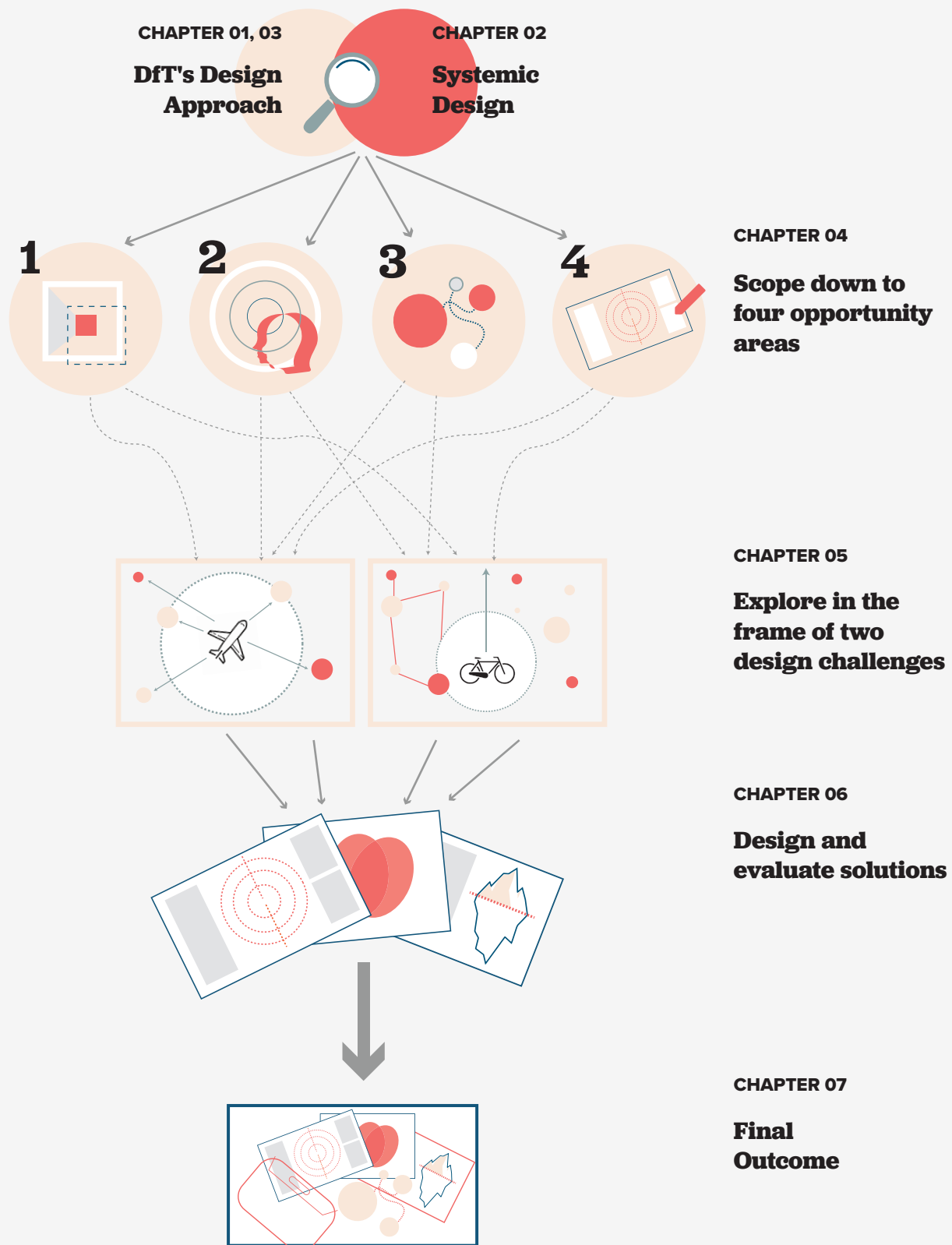
Figure 01: The Project approach

practitioners to gain insights on how they apply systemic design in their work.

STAGE : SCOPE

The scoping phase combines the insights from explorations of the two research questions to propose further directions in which applying systemic design can be explored for DfT. This stage will also help to formulate the design brief in the assignment.

STAGE : DESIGN

The design phase of the project has been conducted in the context of two design challenges that DfT was asked to address. The directions determined earlier guided the explorations of how systemic design can be applied within these two cases.

STAGE : EVALUATE

The design solutions are tested with designers in their process of addressing the two challenges. The insights gained from this helped to learn what elements of applying systemic design worked and what solutions were valuable in addressing the design challenge. It also established the feasibility of the solutions and systemic design for DfT overall.

STAGE : FINAL OUTCOMES

Lastly, the solutions, designed and tested in the previous two phases, have been translated into a final outcome that can guide VanBerlo in applying systemic

design within their practice. The limitations and recommendations of the final design outcomes and the process overall are discussed.

STAGE : CONCLUSION

The project concludes with an overall reflection and evaluation.

01 Chapter:
What is VanBerlo's Design Approach?

Chapter Content

1.0 Introduction

1.1 What is the Design for Transitions team within VanBerlo? What services do they offer?

1.2 What is the DfT team's design approach?

1.3 What are some typical design challenges the DfT team addresses?

1.4 Why Systemic Design for VanBerlo?

1.5 Key learnings: What is important to know about VanBerlo's design approach? Where is it applied? And how can systemic design benefit VanBerlo?

Figure Source: VanBerlo

1.0 Introduction

The first research question (defined in chapter 0.3): 'What is VanBerlo's (Design for Transitions team) design approach?' was broken down to understand the following three aspects:

1. The services provided by the DfT team
2. The phases and tools of VanBerlo's own design thinking process
3. The questions/problems clients pose when approaching VanBerlo

By the means of studying internal documents (to understand (2)), conducting informal interviews (to understand (1)) and hosting a workshop (outlined in section 1.3) to discuss topic (3), the research question was uncovered.

The insights gained helped identify the design challenges and the context of projects DfT worked on. These were also learnings that were found to inform the application of their methodology in practice. Lastly, the overall impressions were used to determine the relevance of exploring the field of Systemic Design for VanBerlo.

Design activities performed

* **Study of documents-** Design thinking methodology, past case studies, graduation project on Design thinking at DfT conducted last year
* **Informal interviews -** With designers
* **Workshop discussion -** On design challenges addressed and approach of DfT

1.1 What is the Design for Transitions team within VanBerlo? What services do they offer?

The Design For Transitions (DfT) team has been set up within VanBerlo with an aim to tackle societal and transition challenges coming from the public, social and health sector domains.

Figure Source: VanBerlo

WHY DESIGN FOR TRANSITIONS?

Their motivation to establish this group was driven by a rise in the number of clients who approached them to act as facilitators and collaborators in solving complex problems or in helping them (clients) adapt to the necessary change. In order to answer to these demands, they set up the team with the unique value proposition of '**co-creating strategies with their clients to tackle transition challenges**'. The team is currently composed of 4-6 members who are innovation strategists and design researchers. While these members are responsible to actively contribute to the DfT portfolio, they are also often supported by visual and product designers on a need basis.

Overall, their approach is fueled by their expertise in design thinking.

DFT'S ROLE AND APPROACH

In line with their belief that the transition challenge lies with their client, they attempt to fuse their role as an expert on design thinking with that of an educator. In this way, they enable clients to adopt ways of working (co-creative, Design Thinking) that can sustain them in the longer run, even after VanBerlo's contribution to the project is complete as an agency. In projects, they work in a collaborative manner alongside key project stakeholders to deliver strategic and innovative propositions. Their solutions aim to not only fit with the capabilities of the client organization but also to take into account developments occurring in the (client organizations) external context.

Using design thinking as the backbone of their proposal allows them to have visibility within the market, owing to the popularity of the term in the field of innovation (Kleinsmann et al. 2017) and also helps to make their approach applicable within the larger team/projects at VanBerlo.

VALUE PROPOSITION

Overall, the Design for transitions team offers mainly three different value propositions for their clients:

* **VP 1. Educate clients on how to innovate :** Conduct a master class to introduce theory, tools and techniques within the design thinking methodology to interested candidates. For example, in the shape of either in-company or open trainings.

* **VP 2. Help a client to tackle a complex problem together :** Use facilitation and co-creation alongside design thinking as the key process methodology to solve the challenge at hand together with the client. For example, urban development in relation to energy transition.

* **VP 3. Solve a complex challenge for a client using their expertise :** Shape the approach, process and outcomes in a project relying primarily on their expertise but allow clients to participate as collaborators through co-creation to gain relevant input. For example, developing an ecosystem to promote economic growth in a region.

1.2 What is the DfT team's design approach?

The DfT team employs a design thinking approach to problem solving that has continued to evolve in the last few years to fit with their growing needs as an agency.

The latest version is a six step model that currently acts as their underlying process methodology. This new version was only created last year as a part of another graduation project. It draws its theoretical base significantly from the previous version based on reframing practices, developed in collaboration with Kees Dorst (Dorst, 2015).
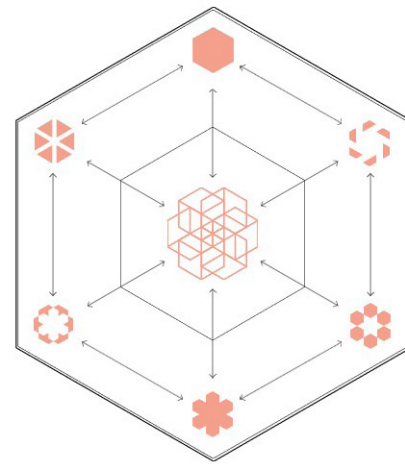
Figure 02: Design Thinking Methodology (Source: VanBerlo)

DESIGN THINKING   Design for Transitions

01 EXPLORE

02 SCOPE

03 UNDERSTAND

04 IDEATE

05 VALIDATE

06 IMPLEMENT

DESIGN FOR TRANSITIONS

51
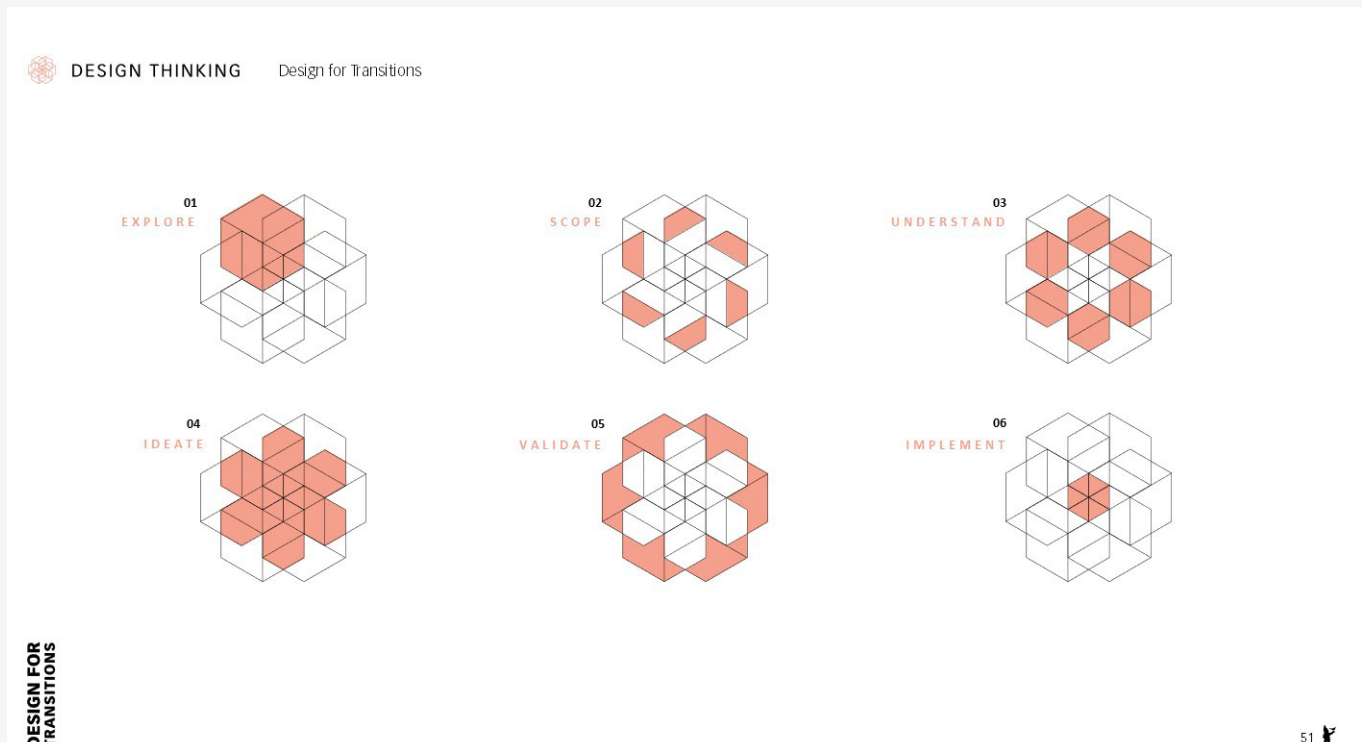
SIX PHASES

The methodology defines six phases : Explore, Scope, Understand, Ideate, Validate and Implement. The 'Explore' phase has been introduced in the new version to put a larger focus on allowing VanBerlo to explore the initial brief presented by the client and to gather existing knowledge about the context being addressed. The 'Scope' phase is to determine the frame of the project based on the growing understanding of the challenge. The 'Understand' phase takes a dive into identifying and collecting the perspectives of the stakeholders involved in the context. This is also where an analysis of the data reveals patterns that are translated into 'themes'. The 'Ideate' phase then uses the themes as anchors to develop solutions through co-creation. The 'validate' stage evaluates the most promising ideas that are desirable, feasible and viable. And lastly, the 'Implement' phase has been introduced to allow VanBerlo to contribute in small steps towards the implementation of selected ideas. Both the 'Explore' and 'Implement' stage, being infant additions to the process, already presented a more open scope for further development.

METHODS AND TOOLS

Though this process methodology is presented in a linear manner, each of these stages are executed in multiple iterations and without a necessary fixed sequence. VanBerlo relies on several methods and tools in the process that help answer the questions and achieve the desired outcomes relevant to each stage. Some of the methods/tools that were observed to be widely used are indicated in the diagram below:

Figure 03: Design Thinking Methodology + Tools

Trend Analysis
Desk Research

Context Radar
Stakeholder Mapping

Interviews
Data Download

Mashup Innovation

Prototyping
Storybaording

Strategic Roadmap

1.3 What are some **typical design challenges** the DfT team addresses?

The aim of this section was to gather preliminary insights on the context, (of the design challenge and of the projects) in which VanBerlo applied their methodology, that shaped their approach and practice.

The diverse projects in the portfolio of DfT were studied by the means of an online workshop, conducted with the 4 main members of the team. The set-up was facilitated through a Miro board where a large repository of projects ongoing and executed in the past four years was created.
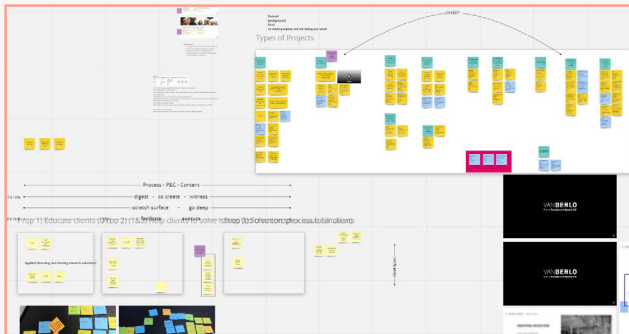
By reflecting on the following two questions, projects were clustered and discussed: **'What is the design challenge being addressed within each project?'** and **'In what capacity and role did VanBerlo contribute within the project context?'**. To illustrate, two cases have been explained here. These cases were also further studied in Chapter 5, to dive into how VanBerlo applied their methodology into practice.

Case 1

* **Design challenge -** A municipality was developing a proposal for changing the infrastructure of roads in a neighbourhood and was seeking to collaborate with the citizens in determining how this development could look like.
* **Role -** VanBerlo acted as the facilitator to bring together several stakeholders to collaborate and create a vision for how the area could develop to suit the needs of all parties involved.

Case 2

* **Design challenge -** A social housing corporation, invested in the urban development of a new area in Eindhoven, wanted to engage citizens, public organisations and private companies in shaping the future of a neighbourhood together in a participatory manner.
* **Role -** VanBerlo worked together with the corporation and architects to facilitate the co-creation of not only how the buildings will look, but to envision a new way of living, working and playing.

Figure 05: (On top) Two example cases that DfT addresses

Figure 04: (On the left) Visual of the Miro workshop

Data gathered during and after the discussions was mapped on to sticky notes and clustered in the Miro environment. An understanding through this exercise was uncovered on two fronts - (1.3.1) kind of design challenges addressed by DfT and their typical attributes and (1.3.2) challenges that VanBerlo faced as a service provider in the context of these projects.

Further in the chapter, Insights from (1.3.1) helped motivate the choice for why exploring systemic design could be valuable for VanBerlo's context. While (1.3.2) helped identify potential challenges within their practice that would inform the design requirements set in Chapter 04.

....>

See further for section 1.3.1 and 1.3.2

1.3.1 Kind of design challenges addressed by DfT and their typical attributes

The clients DfT team catered to typically ranged within the public to semi-public sector domain, which included municipalities, social organisations (housing, wellbeing) and public service providers to name a few. They also had worked with a handful of commercial clients to develop service or product propositions by combining their design thinking approach with the studio's larger expertise in product and service design.

The different kinds of outcomes produced as deliverables to answer such questions (listed in Figure 6) were: From the creation of new value propositions, roadmaps towards a strategic vision, frameworks for collaboration to the development of new products or services. These design challenges presented some attributes listed below which brought about new requirements, considerations and added complexity in the design process.

Design challenge: Some example questions that DfT worked on

1. *"How can we inspire daring policy decisions and external stakeholder participation on the future of the city?"*
2. *"How might we create awareness and activate citizens through retail channels about extreme weather (climate adaptation)?"*
3. *"How might we facilitate an alliance between public institutions to tackle debt in the province?"*
4. *"How might we develop a vision for an urban neighbourhood together with citizens and local businesses?"*
5. *"How might we improve the experience of traffic operators in an amusement park?"*
6. *"How might the client develop a brand to communicate their intensive services in a stimulating manner?"*

Figure 06: Kind of design challenges addressed by DfT

ATTRIBUTE: QUESTIONS POSED LIE WITHIN A LARGER SOCIETAL OR TRANSITION CHALLENGE

During the workshop, the DfT team identified that the goals their clients want to achieve are embedded within the context of a larger societal or transition challenge. To give an example, in the assignment for creating an alliance between parties (in example question 3, Fig 6), the holistic challenge that the client (municipality) wanted to address was the presence of debt in the province. The scope of the project though was already limited to address the desired outcome of facilitating this alliance and not on investigating the larger problem of debt itself. However, this reflection was important because the DfT team wanted to move towards their aim of being able to contribute to the larger, open challenges their clients are seeking to address. (More reflections on this can be found in 1.3.2)

ATTRIBUTE: CHALLENGE REQUIRES COLLABORATION BETWEEN SEVERAL PARTIES

In most of the design challenges undertaken by the team, collaboration was deemed as a necessity for a successful outcome. Unlike a typical design problem where the focus is to manage the disparity in values and goals observed amongst service providers and service users (or end users), within these projects it was also essential to mediate amongst different institutions/organisations who were driving towards achieving a shared purpose (such as in example questions 1, 3 and 4, Fig 6). Conflicts of interests and lack of understanding between the stakeholders involved (such as citizens and the municipality) were common characteristics that the design process had to solve for. The DfT team applied participatory approaches, such as journey mapping, creating collages and prototyping to name a few, within their projects to address these goals.

ATTRIBUTE: LACK OF CLARITY ON PROBLEM AND SOLUTION

When there was obscurity involved about the context or the problem was still fuzzy as stated in the brief, the design process had to take into consideration uncovering the problem space while still developing a fitting solution that met the outcome or goals desired by the client. However within some cases, multiple stakeholders emerged in the process who were not involved in the project but were found to be contributing significantly to the problem or their participation was necessary in the development of the solution. Or new solutions emerged that the client organisation did not foresee and lacked the ability to implement.

For instance, in design challenge 4 (Figure 6) though the project was initiated by the province, the solution that arose in the end was to be developed by the municipality that did not have the finances required to do so.

In such cases, the outcomes that could only attend to the immediate needs of the client had to be selected and not necessarily those that could address the problem as a whole. Though such cases were few in number, they presented an opportunity to strengthen their approach towards dealing with such fuzzy, multi stakeholder problems.

Mini Conclusions : Attributes

* Problems lie within larger societal or transition challenges
* Collaboration is key to address the challenge + Multiple parties collaborating together can present conflicts, opposite interests, drive towards personal gains and so on
* Exploration of problem and solution space can lead to identification of new problems, improbable solutions or previously unknown stakeholders

1.3.2 Challenges that VanBerlo faces as a service provider within the project context

While the attributes within a design challenge presented considerations for the design process, the context of the project influenced the overall project approach and VanBerlo's role in it.

CHALLENGE: DESIRED GOALS ARE PREDEFINED BY THE CLIENT

Owing to VanBerlo's position as a provider of design services, they are approached with questions that already indicate a desired outcome or goal in the brief. For instance, establishing means of collaboration between different parties (in example question 4, Figure 6) or involving stakeholder groups (such as citizens) within an initiative to facilitate participatory processes and outcomes (in example question 1 or 4, Figure 6). Questions that pose an open challenge, where discovery of the problem space might lead to unexpected solutions, is still limited. Although, as mentioned in 1.3.1, several questions that the clients are actually seeking to address lie within larger societal or transition challenges and hold the potential to be explored.

By adding the 'explore' stage within their methodology and learning from other design disciplines (foresight, strategic design or transition design), DfT desires to be able to position themselves in a manner where they can address more of these complex and open challenges. Additionally, they recognise that the next step of being able to attract an open question to solve might also require active pitching to their clients on opening up the problem and solution space. This means they are essentially seeking to shift the contexts in which they contribute to : from outcome based projects to problem exploration and solution discovery based projects.

CHALLENGE: VANBERLO'S DUAL ROLE SHAPES THEIR APPROACH AND OUTCOMES

The type of projects that were recorded to be the highest in number within DfT's portfolio were the ones that aimed to educate the client along with providing solutions in the process (Value proposition 2 - refer to 1.1). Here, VanBerlo was asked to play both the role of an expert and educator in design thinking. This was motivated by the client's willingness to learn and collaborate as co-designers in the process. But, it also meant that often the tools and methods employed in the process had to be accessible enough for clients who might have limited design capacity or knowledge. This also affected the quality of outcomes they produced since it was a collaborative effort amongst VanBerlo and their clients.

However, moving forward DfT wishes to contribute more significantly in projects

(Value proposition 3 - refer to 1.1), where they are able to exercise a larger influence over problem discovery and solution development in the process.

CHALLENGE: RESOURCES AND TIME VS QUALITY OF DESIGN PRACTICE

Often these projects were executed within limited budgets and with limited design hours to spare as a result. There was also an added element of management in such projects where VanBerlo was responsible for recruitment of participants, planning workshops to maintaining communication within the stakeholder groups. This way of working left little or minimal time to invest in pursuing design activities thoroughly such as analysis, synthesis or reflection.

Mini Conclusions : Challenges

* Open and complex challenges can use new knowledge or capabilities in the team
* Requires convincing and on boarding clients in the process
* Methods and tools designed should be accessible to designers and other stakeholders alike
* A new approach should still be feasible and viable within estimated timelines

1.4 Why Systemic Design for VanBerlo?

Although the graduation assignment began with DfT's interest in exploring Systemic design, it was important to determine the relevance of this emerging field for their current practice and context. The following section draws reflections from chapter 1.3 and literature to argue for the same.

1.4.1 Design thinking is insufficient for complex problems

In literature, traditional design led approaches are said to be insufficient to address complex design problems (known as design 3.0 and 4.0, more in Chapter 2). Practices within design thinking workshops such as empathy mapping, idea generation or brainstorming are said to generate creative satisfaction but lack insight into systemic issues. These systemic issues (or complex problems) need rigorous, structured approaches which can be contrasting to the rapid co-creation approach that design thinking promotes. (Jones and Kijima, 2018). Systemic design combines the analytical knowledge from systems thinking with the co-creative approach in design thinking to strengthen the problem solving abilities of designers.

Exploring and learning from systemic design can fuel DfT's desire to contribute towards the more open and complex challenges their clients face. It could support them to build their capacity beyond design thinking and potentially help expand their current service offerings.

1.4.2 Are the kind of design challenges addressed by DfT, well suited to apply systemic design to?

As we learn in Chapter 2, the application of systemic design academically and in practice has been popular within complex, multi stakeholder challenges. A problem is typically defined as complex when it can be approached from multiple perspectives (sometimes competing) and may have multiple possible solutions (Rittel & Webber, 1973).
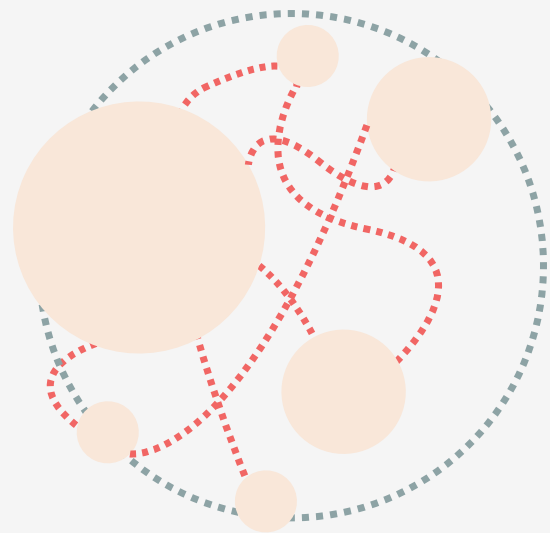
Figure 07: A complex problem

While the design challenge itself that DfT currently deals with might not be necessarily complex, the attributes that it presents can already benefit by using a systemic design approach. Briefly, systemic design entails the following: (More on systemic design can be found in Chapter 2)

* It supports opening up and exploring the problem space to recognise the different causes and effects at play.
* It employs practices that promote different stakeholder groups to collaborate together in order to build a holistic view and shared understanding of the context.
* It aids in creating interventions that address root causes and are designed to adapt to the changing context

By learning or adopting practices from systemic design, DfT can be better equipped to address the design challenges they are faced with. The visual (Figure 8) represents how these attributes earlier identified in 1.3.1 connect with what systemic design can offer.

Mini Conclusions : Attributes + Systemic Design

* Problems lie within larger societal or transition challenges
* Collaboration is key to address the challenge + Multiple parties collaborating together can present conflicts, opposite interests, drive towards personal gains and so on
* Exploration of problem and solution space can lead to identification of new problems, improbable solutions or previously unknown stakeholders

* Open up the problem and opportunity space
* Helps collaborate to share a holistic view
* Solutions that adapt over time

Figure 08: How the attributes can be addressed by systemic design

1.5 Conclusions: What is important to know about VanBerlo's design approach? Where is it applied? And how can systemic design benefit VanBerlo?

1. VanBerlo's Design for transitions team (also referred to as DfT) aims to address societal or transition challenges for clients who belong to the public and semi-public sector domains (such as municipalities, public institutions etc).

2. They apply a six step design thinking model that acts as the backbone of their design approach. The newer phases (Explore & Implement) within this model are at an infant stage and already present an opportunity for further development.

3. The problems their clients are seeking to solve often lie within larger societal or transition challenges. These indicate a scope where the DfT team could potentially start contributing to.

4. In their projects they are frequently faced with a design challenge, involving multiple stakeholder groups, that requires collaboration and mediation in order to achieve the desired outcomes. Hence their design process needs to account for these factors to achieve a fitting solution.

5. In projects where there is a lack of clarity on the problem space, an added layer of complexity might arise. Such projects indicate a need to strengthen their practice in dealing with fuzzy, multi-stakeholder problems.

6. These attributes of the design challenges addressed by the DfT team (stated in 3,4,5) can benefit from the field of systemic design that promotes problem exploration, collaboration between stakeholder and building shared understanding in its overall approach.

What's next?

This chapter outlined the context of the Design for Transitions team and gave an insight into the kind of design challenges they address. Through this knowledge, the relevance of exploring systemic design for them was also established. However, systemic design is a vast and growing field. The next chapter gives a brief introduction into systemic design and begins exploring it through the lens of a key designerly practice applied in it: visualization.

02 Chapter: What is Systemic Design and how is it applied in practice?

Chapter Content

2.0 Introduction

The second research question (defined in Chapter 0.3): 'What is systemic design in theory and how is it applied by designers in practice?' was explored in three parts. The first part looked into what systemic design as a field entails. This first section provided insight into what systemic design offers for designers and to what areas of design domains is it applicable for.

Next, a selected practice within systemic design i.e. visualization was studied. The choice for this was motivated both by the DfT teams' interest in developing this practice and my own inclination towards the topic. Further, a study into how other design consultancies, using systemic design, apply visualization was conducted. This was important inorder to translate the findings within literature into a design studio's practice environment in which VanBerlo is placed. This study revealed a set of principles and practices evident within professional systemic design practice, alongside visualization, that were found to be significant in enabling a holistic systemic design perspective to problem solving.

In the end, the learnings gathered from theory and practice in this chapter are used to reflect on the most important aspects within systemic design that could be applicable for VanBerlo and the next steps are proposed.

2.1 Approach to answer the research question

The RQ: 'What is systemic design in theory and how is it applied by designers in practice?'' was split into three sub-research questions. Systemic design being a vast and growing field, the decision was made to select visualization, a key practice within systemic design, to investigate first. Hence the sub-research questions were formulated in the following way:

A. **What is systemic design?**
B. **How is visualization as a practice applied in systemic design?**
C. **How is visualization used in professional systemic design practice?**

METHOD

These sub-research questions were answered by combining two methods : Literature review and semi-structured interviews. The literature review was conducted on the following topics that served the purpose to explore systemic design and set the theoretical knowledge for it: Systemic design, systems thinking, frameworks for applying systemic design, visualization methods in systemic design and the application of systemic design within social/service design to name a few.

While 5 interviews conducted with academic experts and practitioners supported in learning about their experiences of applying the theory into professional and academic practice. The varying levels of expertise between participants, the context in which systemic design was applied and the type of projects that were discussed in the interviews gave rich and diverse insight into the field, but also made it equally hard to derive conclusive results. This was also a reflection on the dynamic and indefinitive nature of systemic design as a growing field.`

The table 1 outlines all the candidates that were involved in the study and their backgrounds. Three other students who had completed the course on Systems oriented design from the Oslo school of design and architecture were also interviewed, but their data was used informally to enrich the research results.

(On the right) Table 1: All the participants interviewed for research

TAG	INTERVIEWS	CONTEXT	NO. OF INTERVIEWS & TIME	TOPICS DISCUSSED
Academic Expert 1	* Professor at the Institute of Industrial Design at AHO - Oslo School of Architecture	Founder of Systems oriented design and GIGA Mapping	1 (60 minutes)	* Foundational concepts within systemic design * Giga mapping and its relevance * Opportunities for further exploration and development of the GIGA mapping practice
Academic Expert 2	* Associate Professor, Faculty of Design - OCAD * Founder and chair of the Relating Systems Thinking and Design (RSD) symposium	Expert in Systemic design and Synthesis mapping	1 (45 minutes)	* Synthesis mapping approach within academia * Relevance of synthesis mapping and further opportunities for development
Agency 1	1. Founder of Agency 2. Designer	Creators and practitioners of the systemic design toolkit	1 (45 minutes)	* Challenges and benefits of applying a systemic design approach within professional practice * Relevance and application of visualization
Agency 2	* Designer and Studio Lead * Expert practitioner on Systems Oriented Design	Systems oriented design and Giga mapping practitioners	2 (60 minutes)	* Challenges and benefits of applying a systemic design approach within professional practice * Relevance and application of visualization
Visual Expert	* Former systems oriented design student	Giga mapping practitioner	1 (45 minutes)	* Visualization and its importance * Different application areas
Student 1	* Former systems oriented design student	Intermediate (expertise) on Systemic design	2 (90 minutes)	* Interviewee's graduation thesis and how the thesis topic was approached overall using systemic design * Challenges and benefits for designers
Student 2	* Former systems oriented design student	Intermediate (expertise) on Systemic design	1 (60 minutes)	* Interviewee's graduation thesis and how the thesis topic was approached overall using systemic design * Challenges and benefits for designers
Student 3	* Systems designer at a design lab	Intermediate (expertise) on Systemic design	1 (45 minutes)	* Interviewee's graduation thesis and how the thesis topic was approached overall using systemic design * Challenges and benefits for designers * Applying systemic design in practice

2.2 What is Systemic design?

ANALYSIS

Each of the interviews mentioned above were semi-structured and transcribed in full. A separate interview guide was made for each category being interviewed: academic experts, systemic design practitioners and intermediate designers. To contribute to the study's exploratory nature, the codes were generated to identify insights that were different from what was found in literature and interesting from an application (of theory) based perspective. These were clustered to form larger categories that helped gain a nuanced view on the theory being studied alongside (Found in appendix B). Hence the insights from both the interviews and literature review have been used in combination to answer some of the questions within this chapter.

Systemic design is an emerging field of practice and academic study that aims to fuse knowledge from systems thinking and design thinking to tackle problems of growing complexity that designers deal with (Jones and Kijima, 2018). It applies the practice of human centered design in combination with the systems thinking paradigm of holistic thinking and interrelatedness. This is a dynamic and organically developing field comprising a large community of practitioners and educators who are contributing to this body of knowledge in the form of yearly conferences and academic publications.

Designers are said to have the ability to address fuzzy and wicked problems (Rittel & Webber, 1973). This is largely owing to their capacity to make sense of the fuzziness through synthesis, to visualize and to generate creative solutions. Systemic design aims to strengthen these tacit skills that designers already possess by offering principles, methods and tools that have been developed in relation to systems thinking and systems practice. Jones (2014, p. 94) steers away from describing systemic design as a 'discipline', instead calls it a 'next-generation practice developed by the necessity to advance design practices in systemic problems'.

"A next-generation practice developed by the necessity to advance design practices in systemic problems"

Before diving further into systemic design, it can be valuable to learn about what systems thinking is and how it complements the field of design. Some questions answered in the next section are: What is systems thinking? What concepts does it introduce?

2.2.1 What is systems thinking? A brief view.

Monat and Ganon (2015, p. 17) in their comprehensive review, on some of the most popular systems thinking literature, define systems thinking as a 'perspective, a language and a set of tools'. As a perspective, systems thinking focuses on the relationship between parts within a system. A system can be said to be composed of interrelated, interacting or interdependent elements that are performing together to form a 'whole'. Hence as a language, systems thinking aims to describe a system by introducing several concepts (eg: feedback loops, leverage points, mental models) and to synthesize parts along with their relationships into a unified view of the whole.

The set of tools (eg: Iceberg model, causal loop diagrams) within systems thinking support the process of 'diagnosing a system' and aim to eventually surface the underlying structures (relationship between parts) driving the patterns of behaviours

that can be observed in a system. These patterns also represent the concept of 'emergence' within a system, which states that the properties of a system are a result of the relationships that exist amongst system components. (Hasan, 2014)

In this way, systems thinking widens the approach to problem solving by expanding our thinking and helps to synthesize and describe problems in new ways. It also makes us sensitive to the idea that the choices that we make while intervening into a system have an impact on other interrelated parts of the system.

However, authors such as Ackoff (2004) acknowledge the limitations of systems thinking that helps to analyze and model a system, but does not provide strategies to intervene or solve for problems that lie within the system. Design with its capacity to create offers a path towards these solutions and in combination with systems thinking can help in executing well informed choices.

While systems thinking is a vast field in itself, systemic design draws from its most principal concepts of thinking holistically and in relationships. But what does this really mean for designers?

2.2.2 What does systemic design mean for designers?

According to Sevaldson (2013), designers are traditionally trained to focus on the result, that is an 'object' as an outcome. These objects are entities that can be from physical products, services to events. In dealing with complex problems (described in 1.4.2) having an object oriented mindset can prove to be disadvantageous. This is because the complexity in a problem is said to inherently arise as a result of the relationships between several components (objects, stakeholders, institutions etc) that exist in it. Through its approach, methods and tools, systemic design aims to promote this shift in a designer's approach from an object oriented mindset to a relationship centered one.

Hence, as Ryan (2014, p. 3) suggests, a systems thinking perspective when embedded within design allows for a 'truly potent synthesis'.

Within systemic design, design is viewed as an 'advanced practice of rigorous research and critical reasoning' that allows designers to appreciate and synthesize the context from multiple scales and perspectives (Jones, 2014, p. 93). A significant focus within this practice is also laid on working alongside stakeholders to challenge the boundary of a problem context, create

or visualize a shared frame of reference, envision alternative futures and to determine actions to improve a messy situation (Ryan, 2014).

Overall, as Jones (2014 p. 93) states, systemic design relies on designerly competencies such as 'form and process reasoning, social and generative research methods, and sketching and visualization practices to describe, map, propose and reconfigure complex service systems'.

WHAT'S NEXT? ----->

Commonly, and as seen until now, systemic design is said to be well suited for 'complex problems or situations'. However, these complex problems must present certain contexts or characteristics for which systemic design can be beneficial. What are these contexts to which systemic design is applied to? What do they look like or how can they be described?

2.2.3 Where is systemic design applied?

The problems, design as a discipline today addresses, are growing in their complexity. They demand a different level of understanding and new skills to be adopted. VanPatter (Jones and VanPatter, 2009) defines four design domains that represent this visible shift in the landscape of design challenges. These domains, namely Design 1.0 to Design 4.0, are characterized by relative levels of complexity and differ in terms of scale, stakeholder participation, intentions and outcomes. Each of these domains present a new boundary that designers concern themselves with from individual, organisation, eco-system to societal.

Accordingly, the design process and supporting skills, tools and methods that are required also grow as we move from 1.0 to 4.0. The figure (Figure 9) is a representation of what these domains entail.

Jones (2004) describes typical problems addressed by systemic design as complex service systems that are large scale, socially organised and multi organisational. Such problems can be associated with the design 3.0/4.0 domains. Systemic design mainly integrates knowledge and skills described as necessary within these domains, although in practice all the four (domains) are said to
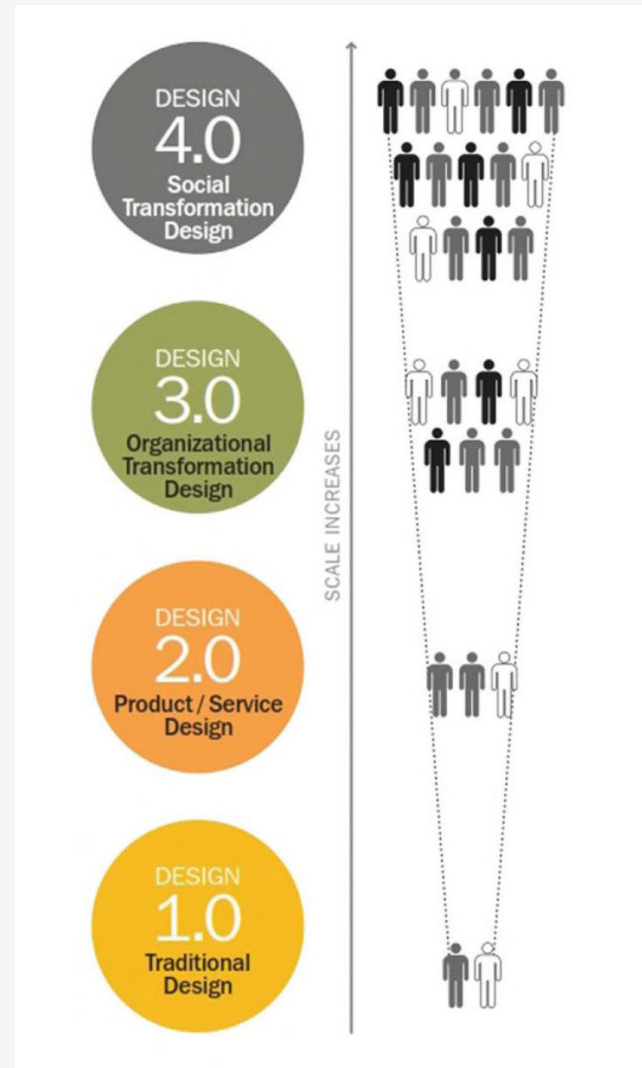
Figure 09: (Source: Jones (2014)) Design domains 1.0 to 4.0

be highly interconnected. Some examples of these complex service systems could be from healthcare, urban development to policy implementation.

In these domains, designers are frequently encountering socio-technical systems. This means within such systems there is technical complexity, that involves components of materials, products and constructed facilities. As well as societal complexity, which is centered around the relationships that exist between stakeholders in a system (da Costa Junior et. al 2019). These two factors can differ in their measure depending on the context being addressed. For example, challenges within healthcare systems can be both a result of technical as well as societal complexity, while a supply chain might involve more technical complexity than societal. Thus, systemic design aims to understand social processes and stakeholders relationships, and their interrelation with technical factors when dealing with complex systemic problems.

Additionally, systemic design is often applied within a problem situation involving multiple stakeholders where each individual perceives the problem from their own interests or values and seeks for outcomes or opportunities that are meaningful to their own self. In such contexts systemic design adopts social methods, such as dialogue, that enable people to uncover the experienced phenomena and build an understanding of it together. (Jones, 2014)

2.2.4 Key Learnings: What did we learn about systemic design?

1. Systemic design is a field that combines the practice of human centered design with the relationship centered approach in systems thinking.
2. It relies on a designer's ability to synthesize, visualize and create.
3. It can be applied in challenges involving socio-technical, organisational or societal complexity. Or all of them, depending on how the problem has been described.
4. It promotes practices such as collaboration, visualization, co-creation and dialogue to work with multiple stakeholders engaged in addressing a complex problem situation.

WHAT'S NEXT? ----->

This section outlined an overview of what systemic design is and where it is applied. The next chapter dives deeper into it through the selected lens of visualization.

2.3 How is visualization as a practice applied in Systemic design?

In order to develop a fitting approach to apply systemic design into practice, several frameworks have been proposed in literature (Sevaldson, 2013; Ryan, 2004; da Costa Junior et. al, 2019). For the purpose of the study, Systems Oriented Design developed by Sevaldson (2013) was chosen to first look at.

This was because it relies heavily on the designers skill sets such as visualization and aims to adapt systemic perspectives and theories whilst still strengthening the inherent skills that designers possess. This direction also served the initial motivation to study the practice of visualisation by looking at the some integral visualization tools used within systemic design called GIGA maps and Synthesis maps.

VISUALIZATION, A KEY PRACTICE WITHIN SYSTEMIC DESIGN

Jones and Bowes (2017 p. 230) suggest that the 'systems we describe are only as tangible as our renderings'. The two design tools explored below, GIGA maps and Synthesis maps, are the methods that help to do exactly that: render the systems visible. They aim to visually

* Facilitate sensemaking by representing relationships that exist in a system
* Communicate diverse perspectives through artefacts
* Create scope for recognising potential design opportunities

They have both been practiced and developed within academic settings at AHO in Norway and OCAD university in Canada respectively. The difference between them is that Synthesis maps lay a larger focus on introducing systems thinking methods within their pedagogy as opposed to the more design-oriented approach of GIGA maps. The motivation to look at these two was not to study the method, technicalities, similarities and differences between them. But to grasp how visualization, applied through these methods in a design process, could provide value to both designers and stakeholders. The section draws its insights from interviews with the academic experts (see table 1).

2.3.1. System oriented design and GIGA maps

Systems oriented design or SOD draws its theoretical basis from a set of system theories such as soft systems methodology, critical thinking and systems architecture (Sevaldson, 2011). As an approach, they employ a practice of creating very extensive information rich maps that were originally based on the concept of Rich pictures (Checkland, 1981). These maps are coined by Sevaldson as GIGA-Maps because they represent large amounts of rich information about a problem situation in a view.

What are GIGA maps used for?

GIGA MAPS AS A TOOL FOR DESIGN INQUIRY

The primary purpose that GIGA maps serve is not only to act as a design artefact to communicate information to stakeholder groups but also to open up an approach to investigation and analysis during the process of uncovering complexity.

It acts as a tool to make known knowledge explicit, share knowledge with experts and recognise the gaps that need to be explored. During their exploration, designers could rapidly map the ongoing research, synthesize it in the process and in this way new questions can emerge that lead to further versions of mapping and inquiry. It can support the process of thinking to uncover the unknowns, as well as the 'unknown unknowns' that are discovered as a result of the process.

MAPPING IS A DESCRIPTIVE AND A GENERATIVE PROCESS

Mapping is essentially an activity to externalize a designer's understanding about the system. There is a part in the process where the designer shifts from describing the system on the map to generating new solutions or design outputs. This is a step that naturally occurs for designers to develop ideas on the go and this nature of mapping makes them both descriptive and generative. In this way new relationships can

be envisioned within the existing system that can be used to drive the desired change.

"..Traditionally, people often think of the design process as phased into research and then design, it doesn't really work like that...I mean, you start to think about things very early... And I think the Giga mapping is really good at helping to unphase, to let things naturally evolve from describing the situation to start then designing it."

(Academic Expert 1)

How are GIGA maps different from information visualization?

GIGA MAPS ARE ABOUT MAPPING RELATIONSHIPS AND BREAKING CATEGORICAL BOUNDARIES

These maps represent rich multi-layered information that integrates concepts of systems thinking with design to develop, describe and 'internalize' the understanding of a complex situation. They display the systemic relations between different components and tend to break the categorical boundaries that are observed

with other types of visualizations such as infographics.

Often the initial maps that are created by the designer are messy and can only be understood by themselves or the team they are collaborating with. This is another significant contrast that exists between visualization within GIGA maps and other approaches such as information visualization focusing on communication.

"Because it's more for the process and you have to be involved in the process to really understand it. At least those giga maps I find most interesting, they are hard to understand. So if it's a process solely, then you can disregard that outsiders have to understand."

(Academic Expert 1)

How do GIGA maps support collaboration between designers and stakeholders?

GIGA MAPS ACT AS A DIALOGIC TOOL

Sevaldson (2018) talks about ruptures that commonly occur when multiple people collaborate. These ruptures can be from stakeholder groups being misunderstood, misaligned perspectives, lack of clarity on the system of interest, to implementation problems that are unforeseen. A common rupture that occurs with designers is when their worldview is built on incomplete information of the situation.

GIGA maps allow these ruptures to be made explicit in the process and when shared with stakeholder groups can help negotiate them better. In this way, GIGA maps serve as artefacts, in collaborative settings amongst designers and stakeholder groups, to foster dialogue and can also act as a reference point while discussing several different topics. They are also commonly used by SOD students and practitioners in place of a 'meeting agenda' to guide the conversation and still maintain a holistic view on the problem situation at hand.

"People can check, issue to issue. But still it's very focused because if one of the participants makes a jump in the conversation, they would also naturally point on the map where they have jumped...so it immediately makes people talk more in systems, more in relations."

How do designers use GIGA mapping in their process?

GIGA MAPS FOR BRAIN AND SPATIAL MEMORY

As the designer maps large amounts of information on a paper, he/she also internalizes and hence memorizes it in the process. Often GIGA maps that are created are destroyed after they've served their purpose. A practice that Sevaldson encourages for designers is to have a 'rich design space' that accumulates the maps created in a physical space. These spaces then serve as a way to create spatial memory of where information lies. This way a designer is able to easily reference a piece of information and not lose it in the process. Due to the impact of the coronavirus, where a lot of the activities at the time switched to a digital medium, the role of working with a physical space was an insightful reflection that emerged within interviews.

""..But in this phase you know that, these and these issues are in that corner of the map or in that corner of spatial memory...And what we lose by working digitally is this kind of visualization and the embodiment of information.."

(Academic Expert 1)

WHAT'S NEXT? ----->

As seen so far, GIGA maps support the process of uncovering complexity instead of being the end outcome, synthesize information visually and help generate artefacts to engage in dialogue with stakeholders. What added benefit does the approach in making Synthesis maps offer?

2.3.2 Synthesis Maps

Another adaptation of GIGA maps called Synthesis maps, developed over the years to suit the curriculum of and practiced at OCAD University, were also studied. Synthesis maps are a type of 'system map enriched with design synthesis' and are referred to as visual narratives. As opposed to analytical system models (system maps, feedback loops, causal diagrams) they are created to be able to reach a broader audience.

Adding to the concept of visual narratives, synthesis maps often use an overall metaphor that represents the problem. For example, the synthesis map below uses the visual of a brain (From Jones & Bowes, 2017). This metaphor then frames various layers of information, system models and research data into a coherent narrative.

Figure 10: Synthesis Map
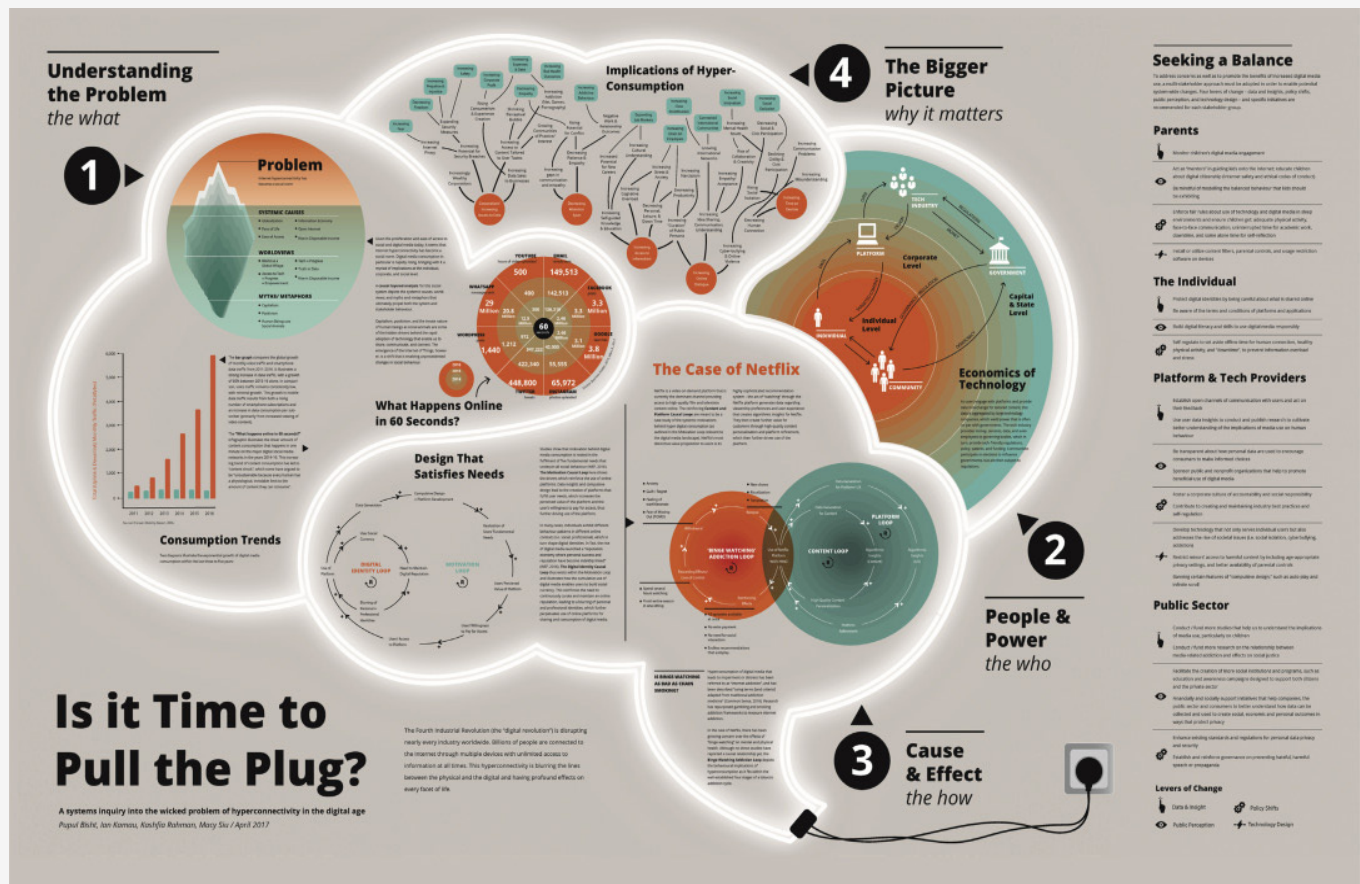
What are Synthesis maps used for?

FRAMING THE BOUNDARY OF THE PROBLEM

Similar to the GIGA mapping approach, synthesis maps also involve 'constructivist learning in action' for designers where they investigate the context, externalize their knowledge and visualize them (Jones and Bowes, 2017 p. 231). Through this process they also are framing the boundary of the problem, which is considered to be a critical step when addressing systemic challenges.

CREATING SHARED UNDERSTAND THROUGH VISUALS

Similar to GIGA maps, Synthesis maps serve the purpose of creating a shared understanding amongst stakeholders and aid in showcasing the potential design outcomes that are available in a problem situation. (Jones and Bowes, 2017).

How are Synthesis maps created and how are they beneficial?

USING SYSTEM ANALYSIS MODELS TO SUPPORT SYNTHESIS

As Jones and Bowes (2017) describe it, the creation of the map itself is an act of creating a collaborative visual to represent the learning that is gained in research. In synthesis maps, the learnings are processed using formal reasoning practices of systems thinking. They employ several popular system models such as causal layered analysis, systemigrams, influence maps and causal loop diagrams to represent complex contexts and embed them within their visual narratives on the map.

Hence, in comparison to GIGA mapping, the pedagogy of synthesis maps employs a significant amount of time for students to learn about concepts within systems thinking. Such an approach provides a rigorous and structured approach to inquiry, analysis and sensemaking .

How do Synthesis maps support collaboration between designers and stakeholders?

MAPS GENERATE COLLECTIVE MENTAL MODELS

Jones and Bowes (2017) refer to synthesis maps as 'products of socialised synthesis'. When stakeholder groups are a part of the design process, they are able to engage in learning in several ways. They are able to frame and reframe the problem and generate collective mental models about the system of interest. Even observers who view the map do not treat it as a static object but as an interactive model of their system of concern. A successful map, as Jones and Bowes (2017) state, allows a stakeholder

to see the system narrative as self-evident instead of being constructed. This makes the value of mapping even more significant when dealing with multiple stakeholder groups who hold different views and perspectives about the problem situation.

2.3.3 Key Learnings: What is the role of visualization in systemic design? What value does it provide?

Broadly, visualization within systemic design reveals two benefits. The first is about 'sensemaking' that is oriented towards understanding relations, for those involved in the process of creating the maps. The second is about 'sense sharing' which means to share a sense of being or phenomena with others in collaborative settings.

1. Through this practice, designers are able to : make knowledge explicit and accessible, synthesize by mapping relationships and internalize data for developing an understanding.
2. Through the process, they are continually framing and reframing the boundary of the problem situation and determining ways to address it.
3. In collaborating with stakeholder groups, maps can help to make mental models explicit and address ruptures in a design process.
4. In sharing with stakeholders, they act as dialogic tools to share and develop on the understanding built so far.

2.4 How is visualization used in professional systemic design practice?

Since both the GIGA map and Synthesis map are tools applied mainly within academia and are a time intensive practice, it was also investigated how visualization either by use of the aforementioned tools or otherwise plays a role within a professional systemic design setting.

Understanding this was important to help determine the feasibility and viability for VanBerlo, as a design studio, to introduce systemic visualization practices/tools. This section draws from insights gathered in interviews with design agencies, practicing systemic design, and a visualization expert (See table 1).

What is their approach towards visualization?

CONDITIONS WITHIN THEIR PRACTICE SHAPE THEIR APPROACH

In the case of both the agencies, investment of time and resources was a critical factor in choosing to develop a preferred approach. Agency 1 revealed that even though they admired tools such as GIGA maps on one hand, they looked at them quite critically on the other, recognising that it takes time and effort to make a good map. Instead, they rely on finding creative ways to communicate efficiently that **"make certain concepts understandable for people but**

won't also take too much time for them to make". Even though they acknowledge that visualization is an important part of the process, they view it as a **"trade off between time vs quality"**. And that they are **"still learning how to visualize a system in an effective way which is clearly understandable".**

Meanwhile in Agency 2, there were experts on SOD who had spent a considerable amount of (internal) time and resources in order to implement the GIGA mapping tool within their studio at large and to establish commercial value for the same (**"7 years in the making"**).

When in the process is visualization used?

TO SUPPORT THE DESIGN PROCESS, TO COMMUNICATE KNOWLEDGE AND TO DEVELOP SHARED UNDERSTANDING

The role that visualization plays could be threefold. It could either serve designers to gather and synthesize data about the problem (1), communicate this knowledge and understanding with relevant actors (2) or act as a way of mapping discussions amongst stakeholders within a room to arrive at a common understanding(3).

The question to pose when choosing an approach is

"do I as a designer have to understand the problem or do the group of people in this room need to understand the problem or do they need to understand context and each other better?"

(Visual Expert)

USED IN COMBINATION WITH OTHER METHODS

Agency 2 **"applies a service design approach towards SOD"**, embedding visualization within service journeys and in mapping the larger context of the organization to **"sense the capacity to change."** They also use a structured mapping approach in the first meetings with stakeholders and during interviews while mapping during synthesis amongst designers is primarily open.

Agency 1 relies on **"system models such as feedback loops and influence maps to communicate the stories that emerge within a system"** to stakeholders. They employ other designerly methods such as storyboarding, scenarios, metaphors and prototyping that support in describing and presenting the complexity alongside other

known system models. For example, they **"often have a core (feedback) loop around which (we) share stories of the system"**.

What value does visualization offer differently in studio practice than what we learnt so far?

FRAMING THE PROJECT BOUNDARIES

One of the purposes that visualization can serve within a brief is to explore the topic either openly or within the boundaries that have been pre-defined by the client, and then narrow the process further by choosing to **"prioritize and contextually frame what is relevant and irrelevant"**. In this way it can help to define the boundary of the context/problem situation or challenge what has been pre-defined. As a result, there can be **"an informed decision that is taken depending on factors that are deemed critical"** in a problem context instead of a decision driven by stakeholders' commercial or personal motives/interests.

DYNAMIC MAPPING IN CONVERSATIONS

When used within Role 3, visualizing/mapping can allow the designer during interviews **"to communicate the immediate understanding of what was said or a perspective that was shared"** and the outcome that is a visual can further act as an

artefact to check if the understanding was correct and to modify it if necessary.

In what ways is visualization applied?

USING A STRUCTURED VS OPEN MAPPING APPROACH

Depending on the purpose of visualization an open or structured mapping could be pursued. A structured map uses templates that have a core structure such as a timeline, user journey, organisational hierarchy, stakeholder circles and so on to guide the process of discovery and synthesis. The structure acts as a backbone but still allows for exploration and is best used in **"quick and dirty explorations"** or when **"engaging stakeholders in interviews or discussions"**.

An open mapping requires the capacity of the designer to visualize. It also relies on his/her expertise in applying principles such as relationship centered thinking to integrate many different kinds of structures (timeline, hierarchy, relationship etc.) into one visual. This is in parallel to what the GIGA mapping approach promotes.

How is systemic visualization made accessible within the studio?

THROUGH THE USE OF VISUAL FRAMEWORKS AND TOOLKITS

Agency 2 has developed an approach to embed giga mapping into their practice by creating a 'giga mapping typology'. Depending on the type of exploration or data that needs to be presented, they either choose from a context, sequence, relations or exploratory type of map alongside a template and facilitation guide for each. This is an example of a structured mapping practice but they also employ open mapping within their internal work.

Agency 1 on the other hand, has created a toolkit to make the overall systems mindset accessible. It guides the user from **"exploring the system and grasping complexity to realising systems transformation"**. They use several visual templates that allow those who are part of the system to participate, feed in the knowledge and eventually make sense of the complexity. However the practice of visualization for sense making relies more on system models than those frameworks explored within GIGA mapping.

2.4.1 Key Learnings: How is visualization used and applied within professional systemic design practice?

1. Visualization is used by designers in a professional practice for: sense making in their own designers process, sense sharing with other stakeholders and for both together when being applied as an ongoing activity during interviews or discussions
2. Based on the context of use, a structured or open mapping can be applied.
3. Design studios can employ visual frameworks and toolkits that make systemic visualization accessible.

WHAT'S NEXT? - - - - ->

A brief intermezzo to evaluate the research results so far

2.5 Brief Intermezzo: In what ways can systemic design and visualization apply to VanBerlo?

We can look at VanBerlo, in the context of the overall project, as a novice in systemic design. For a novice (systemic) designer who might want to start with exploring this emerging field, it can be beneficial to review the following learnings:

The previous sections illustrate that systemic design **builds on** and **enriches** the capacity of designers **to synthesize, visualize and create** in dealing with complex problems. (section 2.2, introduction)

It draws knowledge from systems thinking to provide concepts, tools and techniques that enable designers to **adopt a relationship centered view** on the problem. (section 2.2.2)

It is a field that promotes **rigorous research**, on varying scales and perspectives, and employs **critical reasoning**. (section 2.2.2)

It applies **visualization** as a practice to map knowledge for **sensemaking and sense sharing**. (section 2.3)

It uses **methods such as dialogue within multi-stakeholder contexts** to support **collaboration** and helps build **shared understanding.** (section 2.2.3)

So far, the chosen direction in the study has been to look at the practice of visualization. Many of the benefits observed of applying visualization (discussed in section 2.2), could also potentially be noticeable in the use of it within a traditional design approach.

However, what makes visualization within systemic design different, is the application of systems concepts/ theories that support the practice. The way it allows designers to explore and make sense of complexity can be accredited to the different instructions it provides based on these concepts/ theories, such as breaking categorical boundaries, juxtaposing layers of information or indicating relationships, while visually mapping the data. In this sense, this approach to visualization enhances the benefits that the act itself (of visualizing) might provide in the process of uncovering the complexity in a problem.

For VanBerlo, as a novice, to start applying visualization (as practiced within systemic design) might require introducing the larger fundamental concepts within systemic design that form its underlying approach. To proceed further, Instead of going back to the vast literature to concretize what these concepts should be like, it was decided to look into the interviews conducted with the design agencies to find some recommended first steps. These interviews already also suggested practices and principles, along with visualization. that enabled the design agencies in taking a holistic systemic design approach to problem solving. The next section outlines these identified principles.

2.6 What practices and principles other than visualization are prominent within the systemic design practice?

The observations that were found in the interviews with design agencies, were also supported by parallel findings made in literature and in the systemic design frameworks studied (Sevaldson, 2013 ; Ryan, 2004 ; da Costa Junior, Diehl, Snelders, 2019), indicating the need for a holistic approach towards adopting systemic design as a practice.

While some of these observations are practices and principles, it is also important to note that some indicate an attitude or mindset shift, such as being able to embrace complexity, that can be harder to cultivate. The purpose of this section is to identify the application of approaches, methods, tools or techniques that could potentially support this shift that is desired.

2.6.1 Acknowledge and explore the problem complexity

According to Sevaldson (2013), a systems oriented designer is able to embrace complexity that grows out of the interrelations between objects (actors, products, services). These objects are perceived merely as symptoms of systems that lay behind them. This forms an essential

part of a systems oriented designer's mindset.

Jones (2014) in his proposal for a set of systemic design principles shared between the design and systems discipline, also indicates the principle of 'appreciating complexity' (p. 106). Here if 'the identity of a problem is essentially a frame of reference', then it is important to identify the dynamic complexity of multi-causal problems and understand the relationships that indicate this problem complexity (p. 109).

One of the ways to embrace complexity could be to explore a problem by broadening or expanding the boundary of it. Both agency 1 and agency 2 in their attempt to do this, embed perspectives of **"zooming in and zooming out"** and **"moving between the big picture and the inner motivations of people"**. They deep dive into the context by **"conducting interviews with subject matter experts"**, **"interviewing actors in the system"** and **"doing thorough quantitative and qualitative research"** to gain rich insights that open up the problem space.

Such an approach is also evident in the framework by Ryan (2014), where the first stage i.e. inquiring is meant for designers to

'expose external perspectives and different worldviews that provide opportunities for reframing'.

2.6.2 Framing the problem situation or context

The designerly practice of problem framing is closely linked with the principle of appreciating complexity. In their study on systemic design practices and principles within social innovation, Van der Bijl-Brouwer & Malcolm (in press) recognised that designers when acknowledging the interrelatedness within complex problems, also evidently applied this perspective within their problem framing practice. To generate such an expanded systems view, visual tools that support 'expansionism' within systems thinking/systemic design, such as rich pictures and GIGA maps, can be employed.

As stated by sevaldson (2013), often framing within design projects is directed by commercial interests. But in order to embed considerations about society, culture, economy, trade and so on, a deep engagement in systemic interrelations is needed. A systems oriented designer seeks to inter relate different knowledge

fields that emerge within complex problem situations to understand them better and even increase the complexity by adding further considerations such as above (society, economy etc) and that of the client organisation. Although it is important to note that GIGA mapping is mainly an open approach to exploring the system.

"..therefore the framing process is first of all, for me first not about framing but about expanding. The first thing you do when you start a map is to map until you draw up and try to go as far out as you can. So now I have someplace else to start, not the obvious, you go to the rim of the reel, the horizontal problematique in a way.."

(Academic Expert 1)

Within professional practice, the agencies showed implicit and explicit framing moments. Both of them conducted an initial **"framing workshop with the client"** to challenge the scope of the project.

Throughout the design process, the problem was explored, enriched and framed by the means of open or structured mapping. The way they **"dynamically shifted the frame of the challenge"** also supported their decision making within each step. An important element that was achieved through their workshops with clients was to **"situate the boundary of the system in a common language"** and to define actors and stakeholders important to problem context.

2.6.3 Exploring the system through stakeholder perspectives

Both the agencies identified and interviewed several different kinds of stakeholders in the system to gather their perspectives. They conducted a human centered inquiry and mapped the insights in a relationship centered manner. This helped them to uncover the relations between the different stakeholders and to understand how they influence each other's goals, values, position in the system.

Van der Bijl-Brouwer and Malcolm (in press) in their study made similar observations

where designers combined human centeredness with the systems thinking approach of a focus on relationships. This led them to also identify tensions emerging between stakeholders, apart from recognising the needs and aspirations of individuals. Such practices can enable the shift from a focus on end-user centered to systems cented.

In their interviews, agency 2 employs tools such as the Iceberg model to dive deeper into the mental models of the stakeholders. Their 'actants and drivers' tool was designed to map the interrelations between actors to show how each actor experienced the system differently and what factors contributed to the change in their experiences. Often within workshops they also introduced a set of human drivers cards **"to trigger the system (stakeholders) in a room by the same set of drivers"**. This could sensitize the participants on the diverse perspectives and help achieve a common understanding on the problem at hand.

2.6.4 Designing for multiple futures and multiple interventions

A complex problem cannot be solved, which means there is no 'one solution' that exists. However, it can be influenced. A concept that is popular within systems thinking is that of leverage points. Leverage points are places in a system where relatively minor interventions can lead to relatively major changes in certain outcomes (Meadows, 1999).

By identifying leverage points, Agency 2 uses them as a handle to **"speculate how the factors affecting the system might change, in turn leading to multiple possible futures".** When designing for solutions they aim to capture the required variety, hence designing for multiple interventions along the process. Here, designely skills such as scenario building are used as prototyping methods to represent these possible futures and to make it evident that things are always changing. The use of **"values on different levels such as organisation and society that are desired"** however can still act as constants to envision possible solutions.

Another key focus in systemic thinking is to look for places in the system (or leverage points) that already present a capacity for change. Agency 1 often uses maps such as a combination of user journeys and organisational structure to identify this potential or need for change. Both the agencies recognised that a part of enabling a system to change, might also require providing resources within their client organisation to manage the change. For instance, Agency 1 attempted this in their projects by introducing GIGA mapping practices inside client organisations. While Agency 2 aims **"to provide the right tools and allow stakeholders to adapt (for instance) by suggesting an intervention model (a model that represents what change is desired and what is needed to steer towards it) with enough variations of the future".**

2.6.5 Synthesizing information/data in relationships

While the aforementioned approaches, methods and tools can also be identified in other design fields such as strategic foresight or future visioning, an overarching

principle within the systemic discourse is the importance of thinking in relationships. As we have learnt so far, this can be applied in many different ways such as recognising factors in a system affecting each other, mapping relationships between stakeholders, identifying interactions between socio-technical elements and so on. To facilitate this necessary shift towards a relationship centered practice, Agency 1 stresses on the importance of **"building systemic literacy within the organisation"**.

The use of systems thinking methods for analysis such as causal maps or feedback loops already promotes this way of thinking. However, these require some formal education and critical reflection to be applied appropriately. As a more soft approach, Systems oriented design in their pedagogy have developed a library of systemic relationships that helps designers to analyze and recognise different kinds of relationships within a system. Such a library allows designers to gradually form their own repertoires.

2.6.6 Key learnings: What are the practices and principles (other than visualization) found in systemic design?

1. The attitude of a systemic designer to embrace complexity fuels them to explore the problem from different scales and perspectives.
2. Expanding the boundary of a problem supports the problem framing practice for designers in their design process and when collaborating with stakeholders.
3. Systemic designers combine human centeredness with a systemic approach in exploring stakeholder perspectives. This enables the shift from an end user centered to system (stakeholder) centered approach.
4. Within systemic design challenges, the focus is on the design of multiple interventions and for multiple possible futures. This also could mean helping stakeholders build capacity to adapt to change.
5. Lastly, the shift to a relationship centered perspective can be achieved through building systemic literacy or introducing accessible resources such as the library of systemic relations.

2.7 Conclusion: In what ways can insights gained from systemic design theory and practice inform the next steps for VanBerlo to apply systemic design?

So far, the project explored the field of systemic design, how visualization is applied in it and some of the practices and principles evident in a professional systemic design practice. Gathering the conclusions listed in 2.5 and the key insights found in 2.6.6, the following things can be said:

1. Adopting a systemic design approach can strengthen a designer's capacity to synthesize, visualize and create.
2. Exploring a problem on varying scales and seeking different perspectives through research reflects a systemic designer's attitude of embracing complexity.
3. Expanding and exploring the boundary of the problem, can further support the practice of problem framing in a complex problem situation.
4. Investigating stakeholder perspectives in a systems-centered manner can mean synthesizing human centered insights to understand relationships.
5. Generating solutions within a systemic design process can lead to or can entail envisioning multiple interventions and multiple futures.
6. Visualization can be an ongoing practice to support sense making for designers in the process.
7. Presenting visuals as communication artefacts or visualizing during discussions, along with the use of dialogue in multi stakeholder contexts can foster collaboration and shared understanding.
8. A relationship centered view on the problem can be embedded through building systemic literacy (introducing concepts within systems thinking), by offering resources to help designers build a repertoire (such as the library of systemic relations) or by the use of tools/methods/techniques/structured templates that instruct on how to apply this way of thinking in practice.

These findings present several potential directions that can be explored for VanBerlo. For instance, how can they apply systemic design to strengthen their problem framing practice? How can they build a practice of (systemic) visualization for sense making? How can they apply a relationship centered approach to synthesizing data in their design process? How can they use methods such as visualization in multi-stakeholder contexts for building shared understanding? And so on.

Some of these directions also prove to be suitable for the design challenges addressed by DfT and their attributes (found in 1.3.1), such as working with multiple stakeholder groups or dealing with fuzzy problem contexts. To proceed with making a selection on which of these findings listed above could turn into the most promising directions for VanBerlo's context, a short research was planned. This involved studying two projects undertaken by DfT in the past, through which insights could be gained on how they are currently pursuing their design activities and in what ways can their way of working benefit from applying the findings listed above.

What's next?

This chapter presented insights from research on systemic design theory and how it is applied in practice. The findings gathered indicate potential directions for VanBerlo to apply systemic design. To further scope these directions, the next part of the study focuses on investigating two projects undertaken by the DfT team. From this, more concrete opportunity areas can be scoped out to recommend how VanBerlo can start to apply systemic design.

03 Chapter: In what ways can DfT benefit from systemic design?

Chapter Content

3.0 Introduction

3.1 How does the DfT team conduct their design projects?

3.2 Conclusions : What are some potential spaces where Systemic design can be applied?

Figure Source: VanBerlo

3.0 Introduction

The findings gathered in chapter 2, based on systemic design theory and practice, already showed some potential directions through which systemic design could be applied. In order to formulate these directions in the context of VanBerlo, it was important to make a selection of those findings (listed in 2.7) that were well suited to be applied within the DfT team's current way of working. This way of working was understood by studying two past projects undertaken by the team. The observations from the study helped outline the design activities that are conducted within projects. Further, these design activities were reviewed in the light of the findings (listed in 2.7) to formulate some promising directions of applying systemic design in DfT's projects.

3.1 How does the DfT team conduct their design projects?

METHOD

Two cases executed by DfT were chosen to study and understand the design activities performed by the team. These cases were selected by the team because they best represented examples of a complex design challenge that had been addressed by them. An interview was set up with two designers who worked on each case. Both the designers had 3+ years of experience in working as design strategists and were part of the DfT team.

To record and help the designers reflect on their experience in working on the case, a booklet (Found in appendix C) was shared before the interview. In this booklet, the following topics were covered: Project details, project approach, design activities performed, outcomes achieved and challenges/opportunities faced. The overall goal of the study was to understand

* How they do design thinking in their projects
* What techniques, tools and methods are applied and the purpose behind them
* How design activities such as research, synthesis, visualization etc are performed

ANALYSIS

Each interview was transcribed in full. Based on the findings from section 2.7, the topics below were formulated and used to reflect on during the analysis.

* How do they explore the design problem or challenge?
* What is their approach towards synthesizing data? Do they already study the relationships within the data or between stakeholders?
* How do they generate solutions or conduct ideation?
* What techniques do they employ in dealing with multi-stakeholder contexts?
* Where in their process can (systemic) visualization be applied? How do they already use visualization in their practice?

The insights generated in the analysis were then used for determining the further directions.

3.1.1. DfT's view on complexity of the design challenge

At the start of the study, the designers were probed to think on in the ways in which the problem or challenge they tackled was complex. These were some discussions that emerged. In case 1, the project involved multiple stakeholder groups with conflicting interests that had to be addressed. For example, the municipality wanted to build roads while the citizens feared they would lose their homes. In case 2, though the stakeholder groups needed to be mediated, the complexity was in implementation of solutions, which was technically difficult due to considerations of government laws, rules and regulations.

In both of these cases, the complexity in the design challenge was described by the designers as either conditions within a project that limited the exploration of ideas and the design of solutions or the presence of multiple stakeholder groups that had to be managed. But they did not mention interconnectedness of the various elements or studying the relationship in a problem that could explain the problem situation. By introducing the concepts and theories from Systemic Design could facilitate the shift in how they view a problem and help them describe/map this problem complexity.

3.1.2 Exploration of problem situation and problem framing during the process

In their current practice, DfT was only considering the information and data that was provided by the client within the brief, but internally lacked the time or budget to perform explorations beyond this given data. This limited their initial problem frame to rely on information given by the clients and their own repertoire of knowledge gained from working in similar contexts.

"The client had already prepared a report on their recommendations of how suggested road routes and new technology (technical development) could be implemented to provide the best experience for citizens."

(Academic Expert 1)

One of the ways in which the project attempted to explore the problem scope with clients was through the use of a tool named context radar. This tool probed the clients to think on the related history of the problem, what could be the potential impact if the desired result is achieved/not achieved, trends and developments that indicate the need for addressing the problem and lastly, any inspiring examples that are related to the desired goal. This

moment offered some opportunity for developing further on problem exploration through the use of tools/methods.

3.1.3 Ways of engaging with stakeholders

In their projects, VanBerlo often engaged with the different stakeholder groups in the format of workshops. These workshops introduced activities such as allowing participants to create a collage for exploring a topic or using rudimentary maps or visuals (sticky notes on a sheet, area maps) to help plot their viewpoints. The designers also employed methods such as storyboarding or prototyping to visualize and help validate assumptions or ideas in the workshop.

The format of workshops with stakeholders presented potential for development of tools/methods that could further the goal of making perspectives explicit and creating shared understanding.

Their projects also dealt with multiple stakeholder tensions, caused due to existing relationships, especially in contexts involving government bodies and citizens. There were no explicit strategies that were discussed to tackle these tensions currently, except for conducting discussions. There were also no tools or methods currently employed by them that were helping them explicitly map the relationships between these different stakeholder groups, their values and conflicts.

"No matter what solutions we implement, some people are going to be disappointed"

(Municipality)

3.1.4 Analysis and synthesis of data conducted in the design process

One of the ways observed in which analysis and synthesis is conducted, was by the use of a method named Data Download. Insights gathered, on stakeholder needs, wishes, goals and the context in which they belong, were listed on sticky notes. Similar to affinity mapping, these insights were then clustered based on commonalities to form overarching themes. An example of themes generated in case 2 were **'creating a melting pot (to signify many cultures coming together)'** or **'feeling of being a village within a city'.**

A benefit of this approach as stated by the designers was **'it could be used very efficiently when you are out in the field and to list all insights that were gathered on to sticky notes"**, which could then be brought back to the studio to be clustered. However, this approach did not map or study the relationships that might exist between the data. And there were also no formal methods/tools observed that synthesized the data gathered in the previous stages of initial problem exploration (before field

research) with the new understanding that was generated.

There were also some other informal or context specific ways in which analysis occurred during the process. In case 2, there were moments during a workshop where a visual facilitator made a quick **'visual of each participant within the workshop with his/her ambitions listed on it'** that were then later put up on the walls to stir a discussion amongst the participants. This was also an example where visualization was used. However, the use of visualization as an explicit practice was not observed otherwise and only a handful of strategists had affinity towards applying it in their process.

3.1.5 Ideation and validation approach

Ideation in each case was conducted based on the themes generated at the end of field research. For instance, in case 2, ideas such as a **'temporary landmark attraction or identity building for the location'** were based on the theme of **'pride of local village culture'**. And in case 1, the theme **'lack of collaboration'** became a starting point for a series of workshops to design a path for better collaboration between the different parties involved. However, data gathered in the stages before the field research was not being used to inform the process of idea generation and selection.

LIMITATION OF THIS STUDY

The diversity in the kind of cases that the DfT team had worked on and their relatively growing (new Design thinking process was only developed last year) and flexible approach to problem solving, made it hard to make general conclusions about the design activities they performed in projects. Most practices such as analysis or synthesis were conducted intuitively and relied on the designers own expertise and knowledge to execute them. The design thinking model described in chapter 1.3 was used in some parts of the process but not consistently.

Moreover, the study only focused on what was recorded by the participants within the booklet and could represent an incomplete picture. To get a richer insight into their practice, an approach of shadowing/participating in a live case would have been the most valuable. The above research approach was chosen due to a lack of available cases that were suitable to study and the ongoing corona crisis that restricted some desired activities. In spite of these limitations, a lot of the insights already served as an inspiration for potential opportunity areas that could contribute to or enrich the current design thinking process.

3.2 Conclusion : What are some potential spaces where Systemic design can be applied?

The aim of this chapter was to gain insights on how DfT conducted their design activities and to use these insights for scoping down which of the findings from systemic design could be promising to be applied to DfT's practice.

1. Currently, DfT looks at complexity in many different ways, from managing multiple stakeholder groups in a project to having constraints in the development of ideas or solutions. Studying the problem or challenge in terms of relationships between elements in a problem situation, could help them in structured ways to describe and solve for this complexity.

2. In DfT's design activities, problem exploration is limited by the data clients share and a lack of time or budget in a project. To frame the problem with their clients, they use a method named context radar. Similar to this, further methods/tools could be developed to support problem framing, from a systemic design perspective, based on existing knowledge and information .

3. Currently, DfT engages with their stakeholders in several different ways such as interviews, field research and workshops. These various moments present an opportunity for exploring methods/tools to facilitate stakeholder perspectives to emerge in terms of relationships or to synthesize data gathered from stakeholders in terms of relationships. Another opportunity is to explore a technique to facilitate shared understanding of the context between stakeholders in these workshops, by making the relationships explicit.

4. The way DfT performs their synthesis is from a design approach, like by creating affinity maps. It could be explored how synthesis of data can be facilitated in terms of relationships by the means of methods/tools to make it a formal practice. This could also be developed in a manner to help them synthesize information throughout the process in a dynamic way.

5. DfT uses themes that are a result of affinity maps to generate solutions or ideas on. A systemic approach applies the concept of leverage points to determine multiple interventions and multiple futures, which could be potentially explored for DfT's practice depending on the problem situation at hand.

6. Lastly, visualization in their practice is not very prominent but is deemed as valuable when used in stakeholder workshops or when sharing an understanding with clients. It can be explored how can this practice be integrated into their current way of working.

What's next?

The chapters so far have helped answer the two research questions that were posed at the beginning of the study: What is systemic design and what are the areas where VanBerlo could potentially benefit from applying systemic design. The next chapter uses the research findings to determine potential opportunity areas or design spaces where systemic design could be applied within VanBerlo.
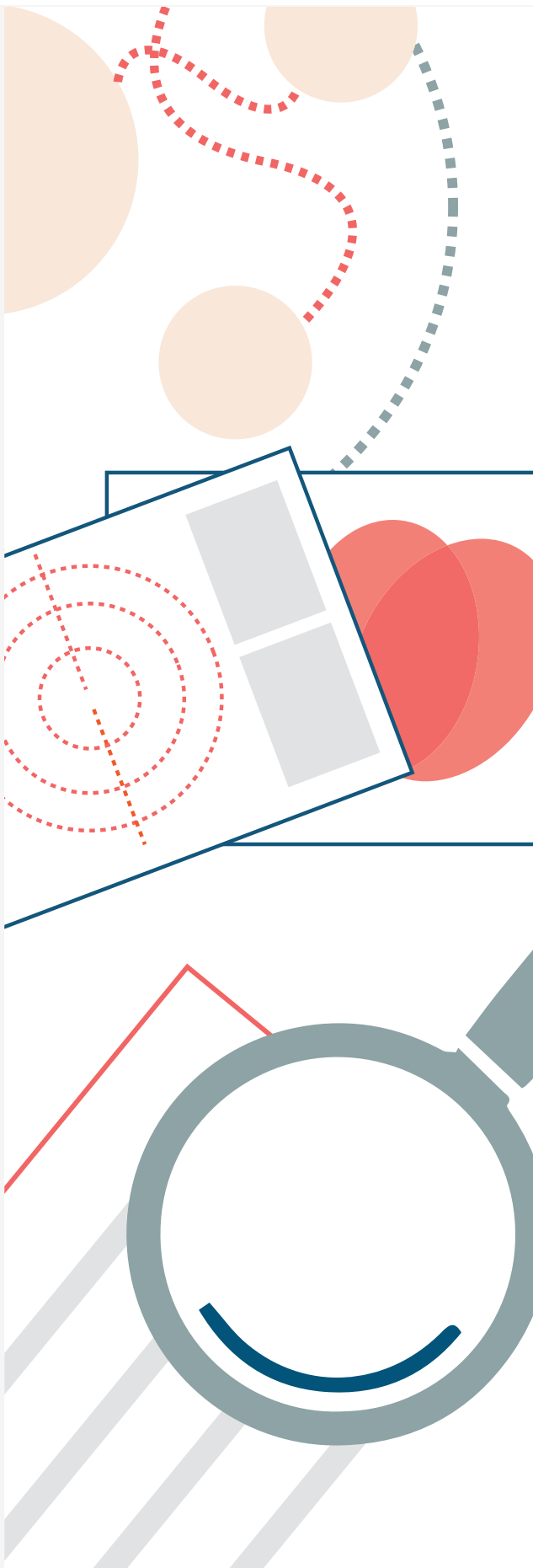
04 Chapter: A Proposal for DfT to apply Systemic design - Four opportunity Areas

Chapter Content

4.0 Introduction

By combining the research findings from systemic design theory and practice (defined in chapter 2) with the insights gained in how DfT conducts design (in chapter 1 & 3), four opportunity areas have been formulated. These opportunity areas offer potential ways (techniques, methods, tools) for introducing systemic design within DfT's design process. Based on the opportunity areas, the design goal was formulated and from the understanding gathered so far on VanBerlo, the design requirements were set. The further plan for bridging the opportunities areas to solutions is stated at the end.

4.1 What are the potential 'opportunity areas' for applying systemic design within VanBerlo?

As discussed in the project approach in chapter 0, the goal of the assignment was to explore how the results of the research phase could be applied in the context of an ongoing/upcoming case of the DfT team. In order to achieve this, four broad opportunity areas were formulated that could suggest ways of addressing DfT's needs/opportunities through systemic design. Moving forward, the opportunity areas are meant to act as a guide for treating two design challenges being addressed by DfT (described in the Chapter 05).

WHAT IS AN OPPORTUNITY AREA IN THE CONTEXT OF THIS PROJECT?

An opportunity area states a potential need or opportunity found in DfT's design activities that could benefit from a systemic design perspective*. Each opportunity area outlines recommended techniques, tools or methods that can help in achieving this desired perspective.

*(A design perspective in literature has been defined as 'a coherent set of values and aspects emphasized by the designer in a given design situation' (Hult Et.al, 2006))
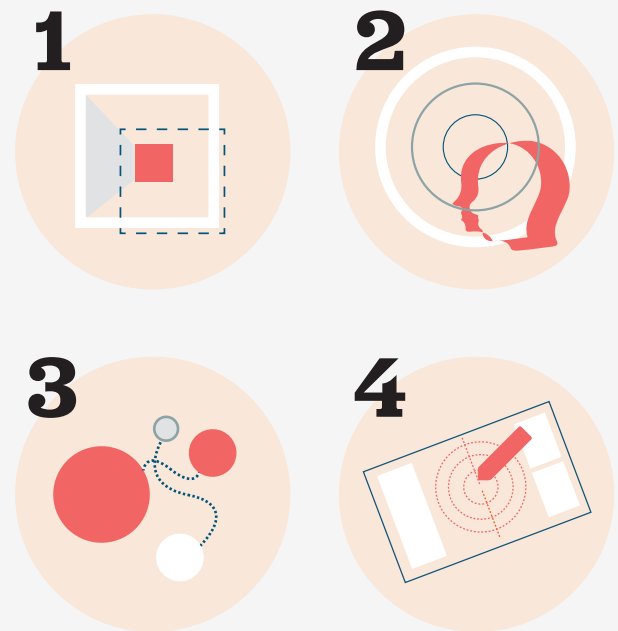
* **Opportunity area 1:** Frame the brief as a complex systemic design challenge
* **Opportunity area 2:** Study human insights in the form of relationships
* **Opportunity area 3:** Conduct the synthesis of data and knowledge in relationships
* **Opportunity area 4:** Apply visualization for sense making and sense sharing

1
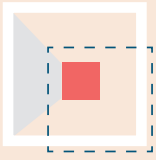
Opportunity area 1 : Frame the brief as a complex systemic design challenge

WHAT IS THE NEED/OPPORTUNITY?

Framing practices within VanBerlo are currently reliant on how open or closed the brief is and the flexibility offered in the solution space (from section 3.1.2). However, they could gain value by making the known explicit and describe in what ways the context or the problem is complex. This can then allow for further exploration to probe into, deepen the understanding of and reframe the initial frame (from section 2.6.2).

HOW CAN SYSTEMIC DESIGN ADDRESS THIS NEED?

One of the benefits that systemic design offers is a way to expand, explore and define the problem context or situation (from section 2.6.1). It can help indicate the 'levels' at which the problem/opportunity lies and to uncover unknown or hidden actors (human or non-human agents) who are engaging at these different levels in the system. This framing of the context can then support in making informed decisions based on data gathered instead of commercial interests and as new knowledge is gathered, it can help determine what is relevant or irrelevant to be considered. Finally, It can also lead to

emergence of new innovation or discovery of solution spaces that were outside the original scope (see section 2.6.2).

WHEN IS IT SUITABLE?

* An important criteria that determines when these techniques could be valuable is (1) how well defined the problem/opportunity area is (2) how well defined the desired outcome/solution space is (3) how rigid the process is.
* If there is a scope for exploration of the problem/opportunity space and flexibility in the solution space, then these techniques suit best.
* If there is a defined desired outcome (such as collaboration) or the solution space is limited (design a service) but the problem/opportunity area is open, then these techniques can be potentially valuable. Often VanBerlo is approached by clients with such conditions or set goals as described in 1.3.2.
* If the problem/opportunity area is well defined and the solution space needs exploration, then these techniques can be the least suitable.
* A rigidity in the process can also have an impact because such an approach might require more investment in time to step outside of the knowledge shared by the client and to explore the frame in depth, which might call for a flexible project proposal.

2

Opportunity area 2 : Study human insights in the form of relationships

WHAT IS THE NEED/OPPORTUNITY?

VanBerlo already has the scope to engage with a diverse set of stakeholders within their projects and applies designerly practices such as interviews, field research and c0-creation to learn from their perspectives. Currently though, their way of investigating and synthesizing these insights is more individual needs, motivations and wishes centered (from section 3.1.3)

HOW CAN SYSTEMIC DESIGN ADDRESS THIS NEED?

Systemic design offers a lens to understand the relationship between actors instead and how they achieve their goals, motivations and needs in relation to each other. Often the presence of a problem can also be a result of the relationships that exist between actors in a system (from section 2.2.3 and 2.6.3). Even if new relationships are to be envisioned or designed for, it is important to map the current relationships and how the actors experience them at present.

Another purpose that systemic design serves is to allow for mental models that stakeholders hold to emerge. These mental models shape the way a problem situation is perceived by each actor. For example, in case 1 (stated in chapter 03), both the municipality and citizens wanted to focus on the wellbeing of those living around the neighbourhood. But citizens had experienced their relationships with the municipality negatively in the past and this impacted the lens they operated from, hence creating the observed tensions. In practices such as mapping within workshops, designers surface these mental models and assumptions of stakeholders to create a shared mental model of the problem situation (see section 2.3.2 and 2.6.3).

WHEN IS IT SUITABLE?

* This approach is best suited to understand a diverse set of stakeholders who could differ in terms of knowledge, power, authority, position or influence and so on. The focus is to shift from end-user centered to system centered and it's important to have access to these actors.
* The aim is to capture the perspective on how the actors experience the problem, their contribution to it and their relationships with those around them. This might require the use of facilitation and dialogic skills to probe deeper and to mediate when tensions arise.

3
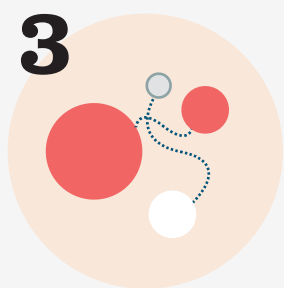
* During this process new stakeholders might emerge who are not within the scope of the project or brief, a possible scenario of which the problem owner should be made aware.

Opportunity area 3: Conduct synthesis of data and knowledge in relationships

WHAT IS THE NEED/OPPORTUNITY?

VanBerlo conducts the synthesis of data and knowledge gathered in their process through the use of methods such as affinity mapping. Informally, they rely on the expertise of the designer and the problem situation to find a suitable way to make sense of the data. Currently, their synthesis activities are conducted mainly for converging within each stage (from section 3.1.4).

HOW CAN SYSTEMIC DESIGN ADDRESS THIS NEED?

Systemic design looks at studying inter-relatedness within data in a context and conducts synthesis to identify/map the relationships existing between elements (actors, objects, institutions, laws, information and so on). It promotes the ability of the designer to synthesize seemingly disconnected pieces of insights to form a whole and to make sense of the context (see 2.2.2 and 2.6.5). This way of structuring synthesis activities allows for breaking categorical boundaries, studying the influence of factors on each other, recognising the root cause of problems or even anticipating the impact of designed interventions later in a design process (see 2.3.2). Resources such as the library of systemic relations or methods such as influence maps that are more accessible concepts can be more introduced first to begin with.

WHEN IS IT SUITABLE?

* Conducting synthesis of data and knowledge in relationships can be applied throughout the process.
* Designers and stakeholders tend to have an object (product/service/activity) oriented mindset. These techniques require an open mind to adapt to this way of thinking and to embrace the uncertainty that might come with the situation.

4
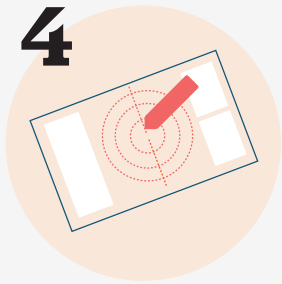
Opportunity area 4: Apply visualization for sense making and sense sharing

WHAT IS THE NEED/OPPORTUNITY?

Visualization within VanBerlo is being applied to some specific use cases, such as scenario sketching, product sketching or for communicating an understanding of a topic/context with clients. The application of it is limited to the design of artefacts for communication and exploration of design solutions (from 3.1.4).

HOW CAN SYSTEMIC DESIGN ADDRESS THIS NEED?

Visualization in this sense is an ongoing practice of making knowledge explicit for understanding, generating new knowledge in the process and sharing it. Within systemic design, visualization is applied as a process oriented practice and the result is not the important outcome. The 'act of visualizing' can benefit a designer to make their own frames explicit, hence allowing them to question assumptions and to identify the lens they operate from. It can help to distill data during research and synthesize it using principles, such as mapping the inter-relatedness, for sense making. And lastly, sharing this understanding in a visual format

with stakeholders can create space for valuable discussions and allow for them to participate through this medium. (see 2.2)

WHEN IS IT SUITABLE?

* Similar to synthesis, visualization can be embedded within practice and can offer benefits in different stages within a design process. But as a formal step or engagement, it can be best applied when multiple people are working together on a case to create shared understanding or when the complexity of a problem situation needs to be communicated to actors outside the design process.
* Visualization can be applied dynamically within stakeholder workshops to facilitate discussions and create visual artefacts that present the understanding gathered.
* If stakeholder participation within mapping is desired, the approach will require a lower threshold in designerly capacity such as sketching and facilitation through the use of structured mapping templates.

Apart from the opportunity areas listed above, some other ones were formulated, such as 'Identifying systemic leverage points' and 'Designing for multiple interventions'. However, applying more advanced concepts from systems thinking such as leverage points can require considerable time and

4.2 Design Goal

The project started out with exploring how the Design for transitions team in VanBerlo could apply systemic design. To achieve this goal, four opportunity areas have been proposed. Through these opportunity areas, different ways and practices of treating a design challenge from a systemic design perspective can be introduced within DfT's design process. While the opportunity areas indicate the very first steps, the larger goal is also to be able to shift their design practice towards a holistic and relationship centered approach to problem solving.

4.2.1 Design Brief

Design solutions (techniques, tools, methods) that introduce a systemic design perspective into DfT's design process by facilitating them in (one or more of the following):

* Framing the brief as a complex systemic design challenge
* Studying human insights in the form of relationships
* Conducting the synthesis of data and knowledge in relationships
* Applying visualization for sense making and sense sharing

As we learnt in chapter 01, DfT works in multi-stakeholder contexts within their projects. This means that the solutions should be accessible and applicable for both internal and external stakeholders. DfT operates in environments with limited time and budget which require the solutions

efforts for learning, which can be a step further as they continue to develop their systemic practice. The four opportunity areas that were chosen in the end are well suited to be applied as the very first steps in the current state of their design practice.

to be easy to adopt and feasible within given project time frames. Lastly, to suit the diversity of design challenges DfT addresses, the solutions should offer flexibility to be modified and applied according to the project context.

4.2.2 Design requirements

The solution should

1. Be accessible to the team i.e. easy to understand, use and adopt
2. Promote new learnings, explorations and outcomes
3. Offer flexibility to be modified and applied according to project scope
4. Allow for multiple people to use collaboratively
5. Be fit for use by designers as well as external stakeholders
6. Be feasible to fit within time and effort estimated in a project

Overall, the resulting solutions should enable VanBerlo to take the first steps towards applying a systemic design perspective into their design practice.

4.2.3 How can the opportunity areas be used in the next steps?

The four opportunity areas above are meant to inform the ways in which design activities can be performed by DfT to tackle design challenges. To derive solutions based on these opportunity areas, two upcoming design challenges, that DfT was asked to address, have been selected (Described in chapter 05). These design challenges could provide the necessary context for exploration of solutions based on the opportunity areas. The resulting outcomes could be tools, methods, workshop setups and so on that support the design activities performed within the selected design challenges.

4.3 Conclusions and next steps

Based on the research findings, four opportunity areas were formulated that present ways in which a design challenge can be addressed. These opportunity areas were:

* Framing the brief as a complex systemic design challenge
* Studying human insights in the form of relationships
* Conducting the synthesis of data and knowledge in relationships
* Applying visualization for sense making and sense sharing

What's next?

The next chapter explores the opportunity areas in the context of two design challenges and presents the solutions that were created.

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2

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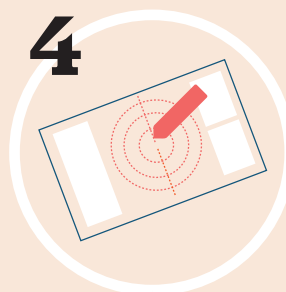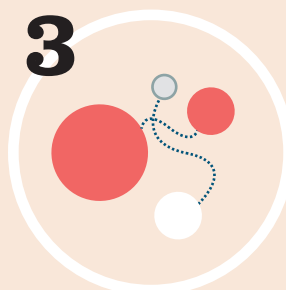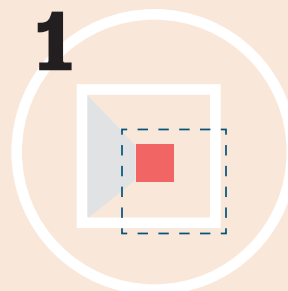
05 Chapter: Exploring the proposed opportunity areas within two design challenges

Chapter Content

5.0 Introduction

5.1 What were the design challenges within which the opportunity areas were explored?

5.2 Exploring the opportunity areas within each case

5.3 Conclusions and next steps

5.0 Introduction

This chapter presents the exploration of solutions, informed by the opportunity areas, conducted in the context of two design challenges (faced by DfT). The solutions were explored on two fronts:

1. To create techniques/tools/methods that tackle the design challenge at hand.
2. To apply the opportunity areas into practice within these tools/methods/techniques.

The resulting outcome was a set of templates and exercises designed to be used in the process of addressing the design challenges. The templates and the set up in which they were applied are explained in this chapter.

5.2 What were the design challenges within which the opportunity areas were explored?

The opportunity areas defined in the earlier chapter are open and can be applied in many different ways. For the purpose of exploring these opportunity areas to generate solutions, it was decided to select one or two design challenges that DfT was asked to address, which would provide the necessary frame in which the explorations could occur. It also meant that certain design requirements stated in 4.2.2, such as the solutions should be feasible to fit within estimated time and effort, could now be determined in the scope of these design challenges. The resulting solutions could also help to determine the overall viability and desirability of applying systemic design into DfT's process (see figure 11).

Design Challenges
Frame to explore the challenge in
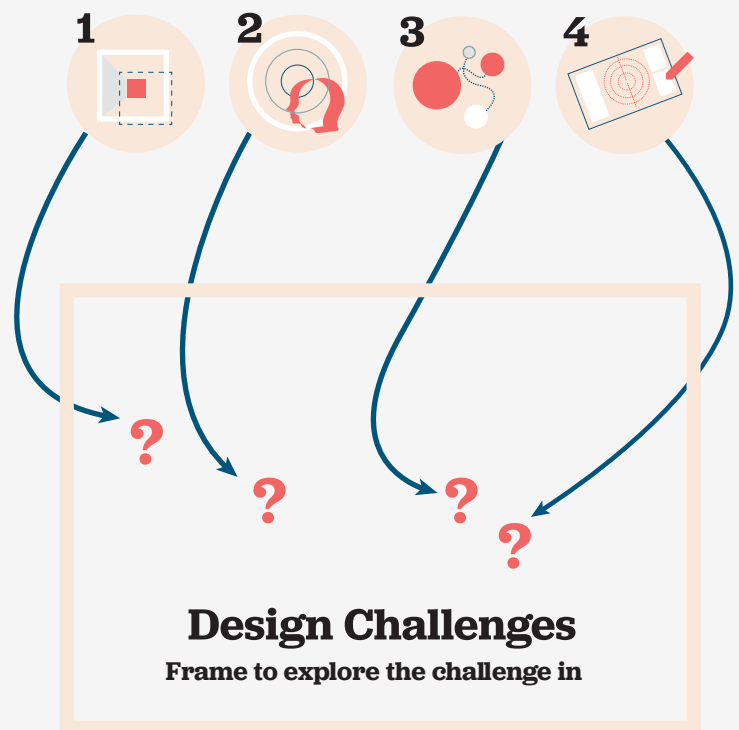
Figure 11: Four opportunity areas, two design challenges - Resulting solutions?

SELECTION OF CASES (DESIGN CHALLENGES)

In the selection of cases, one of the factors deemed as favourable was openness in the brief to conduct investigation either in the problem space or the solutions space. Another factor was the presence of multiple stakeholders engaging in the problem/ challenge whose perspectives could be explored. Both of these factors would make the opportunity areas, especially 1 and 2, suitable to to be applied within the selected case.

In spite of limitations faced due to the corona virus crisis, such as a lack of cases to choose from, a selection of two promising design challenges was made. These two design challenges will be referred to as Case A and Case B moving further in this chapter.

5.1.1 Case A Description

Case A was a project initiated by a city's municipality in the Netherlands. At the outset, the project had been set to implement the advice of a trial case ('proefcasus' in dutch) run by the ministry of Infrastructure and Water. This trial case explored the future of the airport and formulated an advice report for the same. The report gave recommendations on how the airport could better serve the needs of the region in terms of sustainability, urban development, citizen engagement and improving the overall quality of life.

Out of these several recommendations, VanBerlo pitched their proposal to answer the direction of : "How can the airport create added value for the region?". The client team included participants from the main and neighbouring municipalities, the province and the airport authority. The desired outcome stated by this team was to design a set of 'initiatives' that answered to the needs of the region. Some examples of how these initiatives could look like were: a bridge to connect the airport with the main city or a platform for inviting citizens to co-create the development of the airport. Overall, the assignment was set up with a vision to develop an ecosystem of collaboration between the airport and other stakeholders within the region.

WHY WAS THIS CASE SUITABLE TO EXPLORE THE OPPORTUNITY AREAS IN?

This case was well suited to apply the opportunity areas due to its exporative scope within the initial brief. Some initial questions that already seemed fuzzy were 'who are we providing value for', 'who should be involved in the initiatives' and so on. The solution space within the project however, was limited to the design of 'initiatives'. A focus in the project could be laid on building or forging new relationships between stakeholders within the region who would be involved in these initiatives. It also meant that the process required facilitation and collaboration to occur between several different diverse stakeholders to achieve the desired outcome.

Figure 12: Case A : How can the ariport add value?
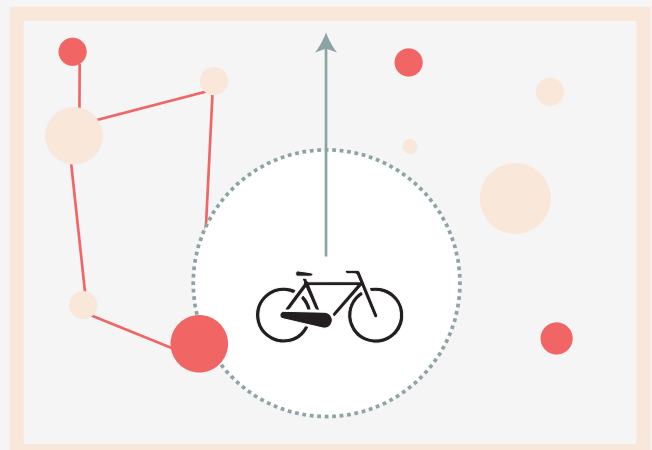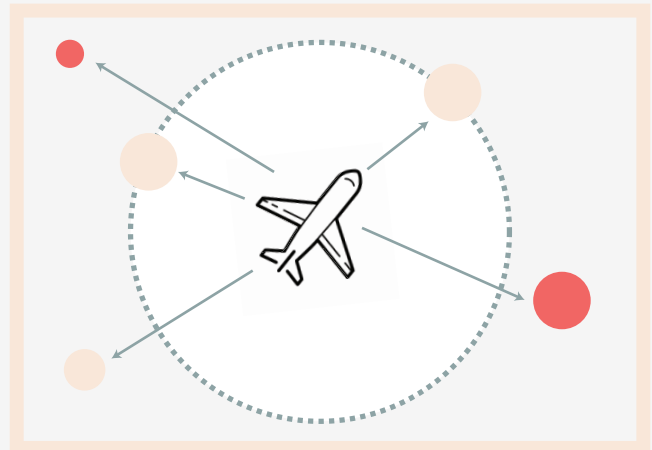
Figure 13: Case B : The future of a global bicycle event

5.1.2 Case B Description

Case B (See Figure 13)was a project situated in the context of a global bicycle race held in Europe annually. This racing event lasts from 20 to 25 days and engages several different organisations working together to make the race a success. One of these organisations, responsible for providing a fleet of vehicles for marketing, promotions and leisure, was the client that approached VanBerlo. Their fleets were designed to be modular and could be put to use to act as stages, booths or lounges within the event. However in recent years, the organisation's consideration about sustainability demands and the lack of innovation or advancement within their fleets put them into a light of concern.

Vanberlo was approached to develop a future vision of how this professional bicycling event will change in the next ten years and in turn how the client organisation will be impacted. For this project, two previous workshops had already been conducted with the client and as a result so far, the VanBerlo team had gathered trends and developments that could potentially shape the future of the racing event. The next steps were to turn these trends into scenarios of how the future might look like, which was the overall goal of the project.

The approach within this project did not utilize the design thinking process and rather focused on formulating a desired future state for the event through an exercise called 'Future Equity' developed at VanBerlo. This approach collected all the indicators such as trends and developments of how the future will change to then speculate possible scenarios.

However so far, the team involved within the project was experiencing difficulties in translating the trends identified in the previous stages into tangible directions for developing the scenarios. This was due to a lack of understanding on the current state of the race and in identifying factors that are influencing it in the present. Thus, an exercise of understanding the event as is and factors currently affecting it were deemed as useful starting grounds for further connecting the trends to the future by the involved team. This case also presented several diverse stakeholders such as the client, the organisations, the spectators and so on who's perspectives had to be taken into account.

5.2 Exploring the opportunity areas within each case

THE APPROACH AND MY ROLE IN IT

Within the two cases, I took up the role to organise the design activities that would be conducted to address the design challenge. This allowed me to think along the lines of "how would I tackle this challenge myself using the opportunity areas defined so far?".

Before diving into exploring the opportunity areas, the challenge was broken down into smaller goals that could help address it. For example, a goal could be: To identify stakeholders who are a part of the system or to map how the system currently looks like. For each of these goals, a design activity was planned. The design activity performed to meet these goals, was facilitated by the means of templates or exercises. These templates and exercises were designed based on exploration of the opportunity areas. Hence, the resulting solutions in each of the cases were a set of templates and exercises that applied the opportunity areas into practice to address the smaller goals (see Figure 14).

The table on the right (Table 2) already gives a peek into all the templates and exercises that were applied and indicates the opportunity areas that informed the design of them.

Informed by the opportunity areas

Addressing goals in the design challenge
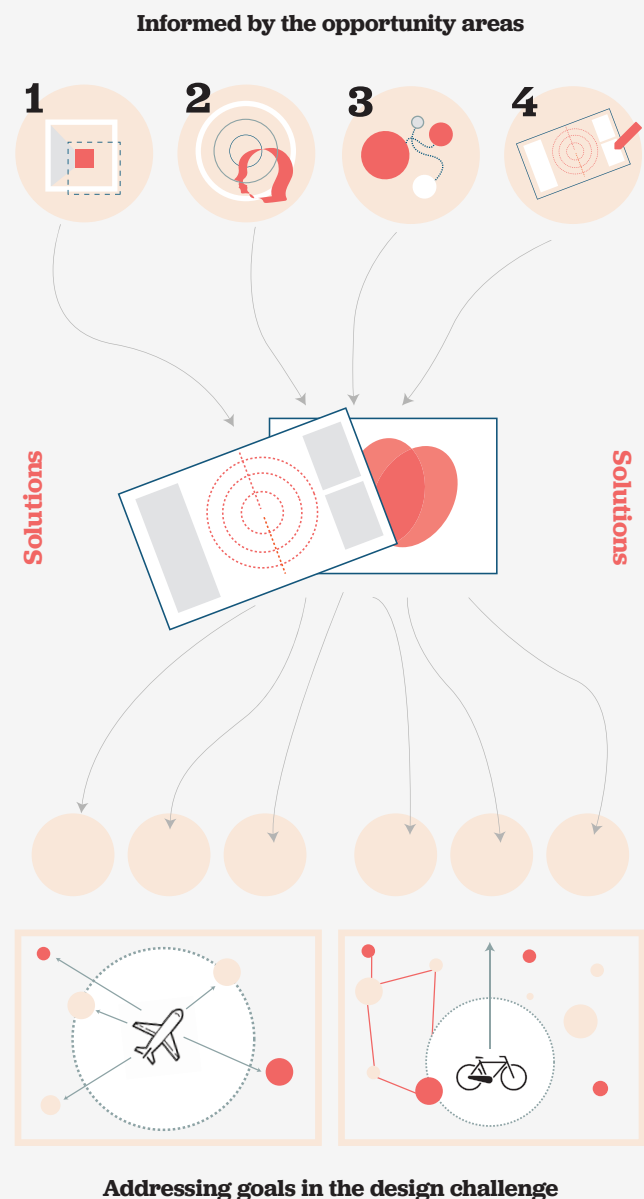
Figure 14: The approach towards solutions

TEMPLATES & EXERCIES	OPPORTUNITY AREA 1 : Frame the brief as a complex systemic design challenge	OPPORTUNITY AREA 2 : Study human insights in the form of relationships	OPPORTUNITY AREA 3 : Conduct the synthesis of data and knowledge in relationships	OPPORTUNITY AREA 4 : Apply visualization for sense making and sense sharing
A. System influence map (Figure 15)	*			
B. System context map (Figure 16)	*		*	
C. System value map (Figure 17)	*		*	*
D. Opportunity map (Figure 18)				*
E. System Stakeholder map (Figure 19)			*	*
F. Framing exercise (Figure 21)	*			
G. Journey map (Figure 20)			*	*
H. Iceberg model (Figure 22)	*			
I. Stakeholder goals and values exercise (Figure 23)		*		
I. Stakeholder relations exercise		*	*	

Table 2 : All the tempaltes and exercises that were designed on exploring the opportunity areas indicated here

5.2.1 Exploration of the opportunity areas in Case A

Initial Set up

This project explored the question: "How can the airport create added value for the region (city and neighboring municipalities)?". I was involved in Case A from the very start of the assignment. Based on the data received from the client, the design activities and related templates/exercises within them were designed.

> **Documents received:**
> * Trend reports on how the province is developing
> * Developments plans for the region
> * Airport's current impact report (proefecauses)

Desired outcomes

In the project proposal, VanBerlo promised two outcomes before the first client workshop.

1. Potential initiative ideas: A proposal where multiple stakeholders could work together to add value, for example a platform for citizen participation could become an initiative.
2. A stakeholder map to represent potential stakeholders who could benefit from or participate in these initiatives.

Goals defined in the challenge

The table 3 outlines the goals that were determined in the challenge, the resulting design activities and templates.

Applying the templates in the design process

The resulting templates were designed and planned to be applied in two workshops of 2 hours each. In these workshops the designers who were working on the case were going to be involved.

Templates/exercises

To explore the initial question, the first design activities were conducted to map the existing system i.e. What role does the airport play in the region and what kind of impact was it creating. Here, the focus was on exploring the context on many different levels. Within systemic design, one of the ways a problem or challenge can be explored is by looking at how the effect of a system exists at different scales and how this effect can be studied over time.

FOCUS ON EXPLORING THE SYSTEM CONTEXT

In this case, the template (A) focuses on mapping the current impact of the airport on the region and specifically mapping who in the system is getting impacted (see template A). This exploration, from an

OUTCOMES DESIRED	(1) Potential initiative ideas and the areas/sectors/domains they belonged to					(2) Stakeholder map
Goal	Determine the frame of the project	Understand what is currently in the system, what impact it creates. how it has developed in the past and what future needs it indicates		Recognise existing solutions in the system and generating new ones	Determine to what areas/domains the solutions belong to	Identify the stakeholders in the system
Design activity	To map why the challenge should be addressed and what are some important directions to take on	To map the impact of the airport and how it currently provides positive/negative value	To map the past, present and future developments of the airport and its surrounding context	To develop initiative ideas by connecting different layers in a system	To map the initiatives within an area/domain	To map stakeholders who could benefit or participate in the initiatives
Template/ Exercises workshop 1	Framing exercise	Template (A): System influence map		Template (C) : System value map		
Template/ Exercises workshop 2			Template (B): System context map	Template (C) : System value map 2nd Iteration	Template (D): Opportunity map	Template (E): System Stakeholder map

Table 3: Goals defined in Case A

individual to societal scale could allow the designers to to zoom in and zoom out on potential actors being influenced by the system (Exploring opportunity area 1). The activity was meant to trigger them to think beyond commonly related stakeholders in the context of airports, such as travelers who predominantly use these services. This could then trigger their thinking on how the airport was impacting broader contexts, such as the society and what impact it was producing.

Template (B) focuses on exploring the developments that have occurred in the past years and are currently taking shape in the airport and its surrounding regions. This exercise was inspired by the idea of exploring a system over time i.e. temporally (Exploring opportunity area 1). The template could be used to map all the data on trends and developments provided by the client, and this could facilitate the designers to think on what needs or wishes these developments were addressing. It could allow them to see patterns in how the region was growing and the relationship between the different developments (Exploring opportunity area 3).

MAP EXISTING SOLUTIONS

Once the designers were inspired by the explorations conducted in the two exercises so far, the template (C) was applied. The template (C) was created to allow the designers to map the system on four levels: the function the airport provides, the value

Deep understanding of the scope : What impact does the   Airport have?

Direct Impact : Creating value as a provider of goods/services or causing harm due to its presence

Noise Pollution

Indirect Impact: Indirect impact of the presence of the airport or negative influence of the airport

The presence of the airport attracts more business travellers

Society

Eco-System

Organisation

Individual

Positive Impact

Negative Impact

For whom or on whom is this impact being created?

Individuals
The end users who are impacted by it.
Eg : Citizens, business traveller or goods supplier

Organisations
An organisation
Eg : A hospital or a university

Ecosystem
A network of organisations
Eg : Transportation or Public health

Society
Society at large
Eg : Eindhoven region

Figure 15: Template A : System Influence Map

Rich understanding of the context

Developements / Emerging Initiatives

Past	*Current*	*Future*

Developments related to the   **airport**

Developments in the   **region**

Past	*Current*	*Future*

Figure 16: Template B : System Context Map

Ecosystem Innovation Map

To Who?

Mechanism, Shape, Form

Direct / Indirect Values

Core Function

Travellers

Airlines

Flight services

Provide means of transport

Job Opprtunities

Manage/regulate air travel

Current

Desired

Legend for using the map

Core Function

Direct / Indirect Value

Mechanism / Shape / Form

To who?

Direct Connection

Indirect Connection
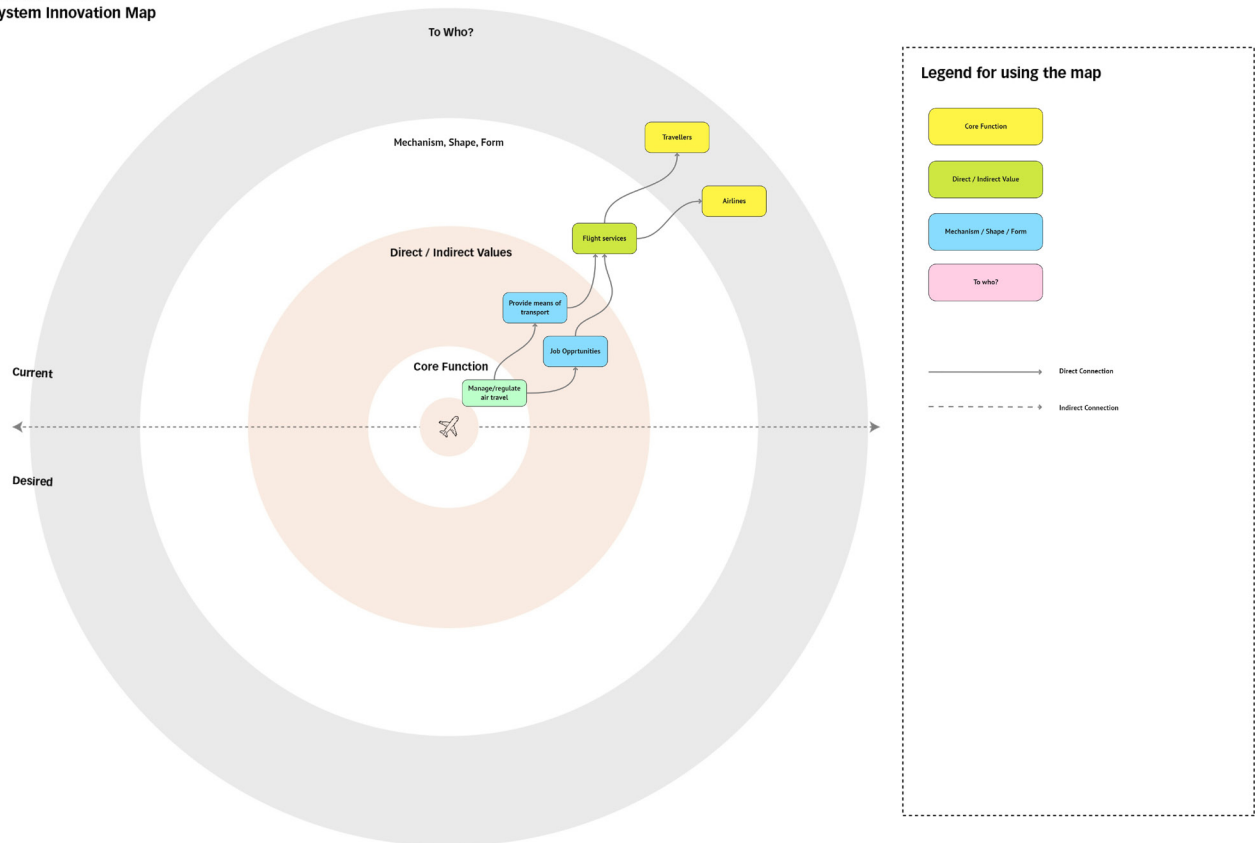
Figure 17: Template C : System Value Map

it offers, the infrastructures or mechanisms (such as services or products) through which it provides value and lastly, to whom. Next, the designers were asked to make the connections between nodes in each layer to further connect the elements in the system. An example is shown in the figure (17). This template explored the opportunity area of 'synthesizing in relationships' through mapping connections and visualizing the data to make sense of it (Opportunity area 3 and 4).

GENERATE NEW SOLUTIONS

The outcome of explorations from Template (A) was expected to generate insights on the current positive impact of the airport i.e value it offers and to turn the negative impact mapped into future desired values. While template (B) was used as inspiration to further sharpen the mechanism layer in template (C).

This is where the already filled map could now be used to: Either create new ideas on the mechanism layer that leveraged the existing functions of the airport (Exploring opportunity area 3). Or identify new stakeholders who were previously disconnected that could gain value from new initiatives. Or to determine new values towards which the airport should create mechanisms for. Through this way of thinking in interconnectedness and relationships,

new and novel ideas could emerge. This exercise was kept more open to see how the designers made use of the different layers.

See further on templates and exercises for Case A

VISUAL MAPPING OF OUTCOMES

The template (C) could now already serve as a visual of the potential new and existing initiative ideas existing in the system.

The next step was to create a visual map : template (D), to identify the domains where the initiatives could be placed (Applying opportunity area 4). And the further explorations could help determine new domains where new initiatives could be proposed.

MAPPING STAKEHOLDERS

The last exercise used the Template (E) to first map all the stakeholders in the system and to connect them with the initiatives as the starting point. This way of mapping could lead to identifying existing relationships between stakeholders in regards to the initiatives and to find where there was opportunity for creating new ones. (Exploring opportunity area 2).

For details on the workshop set up, the templates and supporting activities planned such as homework before the workshop, please refer to the appendix (See Appendix D).

On the right

Figure 18: Template D: Opportunity Map

Figure 19: Template E: System Stakeholder Map

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Name Domain A
Name Domain B
Name Domain C
Name Domain D

A+B
B+C
C+D

A+B+C
B+C+D

Example Initiative

A+B+C+D

Example Initiative

A+C
A+C+D
A+B+D
B+D

A+D

Stakeholder Value Map

Infrastructure
Innovation
Economy
Community

Knowledge Capital
Technology Playground
Innovation Capacity
Public Infrastructure
City Infrastructure
Digital Infrastructure
Nature & Parks
Public Infrastructure
Digital Product Companies
Garantee
Online Services
Neighborhood Associations
Design Agencies
Start Ups
Universities
Start-up Ecosystem
Architects
Clubs
Builders
Boutiques
Banks
Financial Investment / Capital
Business Economy
Local Economy
Hotels
Luxury Goods Seller
Restaurants
Multinationals
Corporations
Example Initative
Eindhovenaar
Business Visitors
Non Profit Organisations
Visitors
Social Good
Underprivileged Citizens
Young Adults
Families
Children
Community Value
International Expats

Profits from the initative
Contributes to the initative

5.2.2 Exploration of the opportunity areas for Case B

Initial Set up

This project had already explored the question: "How does the future of the bicycle event look like?". When I joined the project, the team had created a list of future trends that could potentially shape the future of the racing event. My role was to help them map the current system as is and to connect it with the trends. This way the team could further use this knowledge to explore future scenarios. Based on the data received from the project owner, the design activities and related templates/exercises within them were designed.

Documents received:

* Events that occur in the race
* Stakeholder perspectives of the organizer and client organisation

Desired outcomes

This case was taken up to simply explore the things listed below. These outcomes were determined in collaboration with the project owner. It did not demand any formal outcomes to be achieved, but was really to help the designers in addressing the challenge from a new perspective.

1. How is the event currently being organized?
2. What factors are important to the event and how are they changing?
3. Who are the stakeholders and how do they relate to each other?

Goals defined in the challenge

The table 4 outlines the goals that were determined in the challenge, the resulting design activities and templates.

Applying the templates in the design process

The resulting templates were designed and planned to be applied in two workshops of 2 hours and 1 hour each. In these workshops the project owner who was a strategist and two interns had planned to participate. These workshops were more loosely structured and allowed for more open explorations with less templates and more exercises. This was to incorporate some of the feedback received from the solutions designed in case A (as explained in 6.1.3).

Templates/exercises

MAPPING THE SYSTEM AS IS

The first exercise probed the designers to think of all the different events that are taking place in different stages of the race. This was mapped on the template (G). It was meant to help the designers reflect on

OUTCOMES DESIRED	(1) How is the event currently being organized?	(1) What factors are important to the event and how are they changing?		(2)Who are the stakeholders and how do they relate to each other?	
Goal	Understand what activities are currently being performed in the system	Determine what factors are affecting the system and why		Identify stakeholders in the system	Identify relationships between the stakeholders
Design activity	To map the all the activities performed in the event and stakeholders who are a part of it	To understand what factors determine the success of the event and why there is a need for change	To dive deeper into the changing factors and what is causing the observed changes	To map the goals and values of stakeholders identified in step 1	To map how the stakeholders achieve their goal in relation to each other
Template/ Exercises workshop 1	Template (G): Journey Map	Template (F): Framing Exercises	Template (H) : IceBerg Model		
Template/ Exercises workshop 2				Template (I): Stakeholder goals and values exercise	Template (I): Stakeholder relations exercise

Table 4: Goals defined in Case B

various different systems that exist within the race from entertainment, transportation to the changing city infrastructure that accommodates the race. Sequentially mapping the events could also trigger them to think of all the known and unknown stakeholders that are acting in the system, in order to make the event happen. (Exploring opportunity area 3).

FRAME THE CHALLENGE

Overall, this case reflected a need for change. The framing exercise (F) was a set of questions to be used in order to frame the challenge. These questions could help the designer to map the evidence for change in the system both internally within the client's organisation and externally in the changing context (Exploring opportunity area 1). This exercise was expected to result in a set of the most important factors that are affecting the system and the success of the event.

The factors could then be further dissected using the IceBerg model (H) adapted from The System Thinking Playbook (2010). By uncovering the deeper level of insights that are shaping the changes (Exploring opportunity area 1), it could help the designers later in the project, to make a choice on which trends are already indicating the identified insights and how they will influence how the trends take shape.

▶ **The journey of the event**

Stages	Before	During	After
Sub - Stages			
Activities			
Stakeholders			
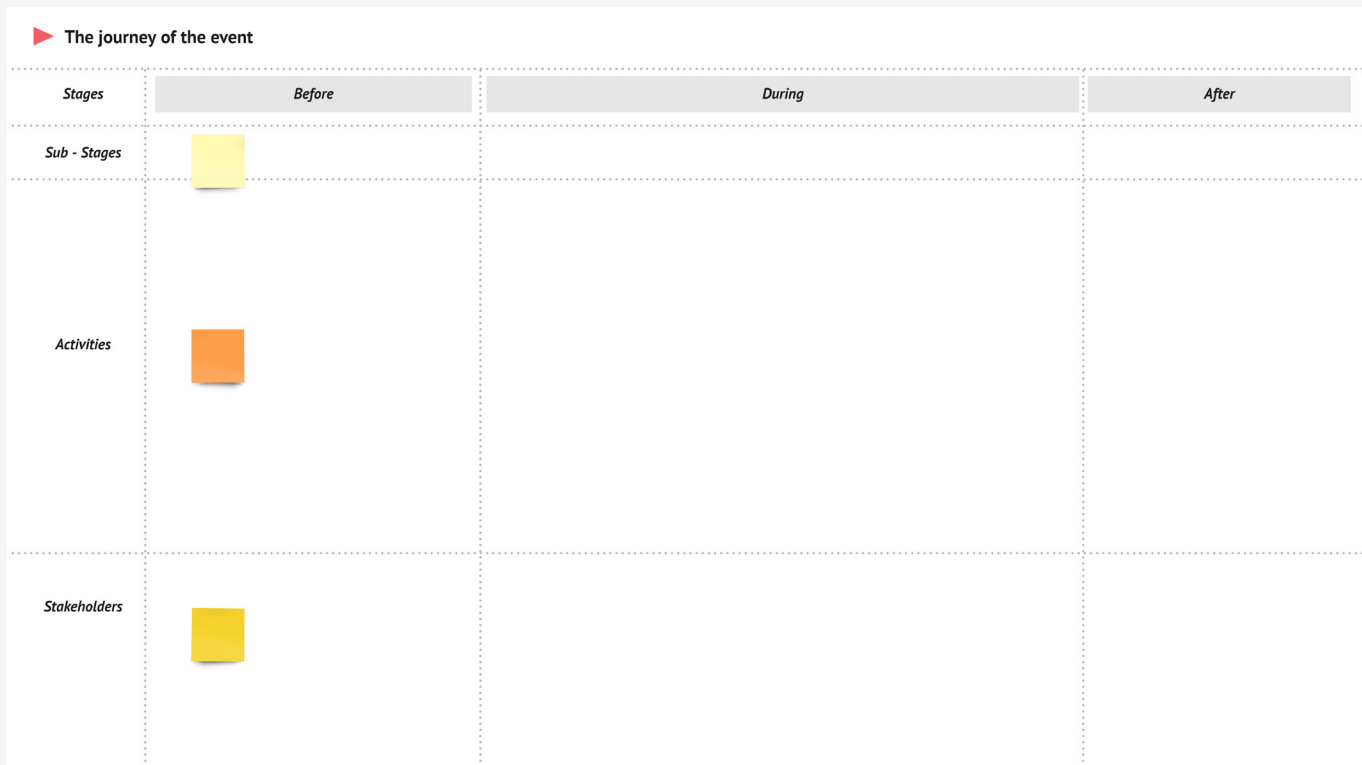
Figure 20: Template G : Journey Mapping

▶ **Framing the problem**

Current view of the system   *Need for change*

Why is there a need to change?

Racing event

What factors are essential to the success of the event?

What factors are driving the need for change?
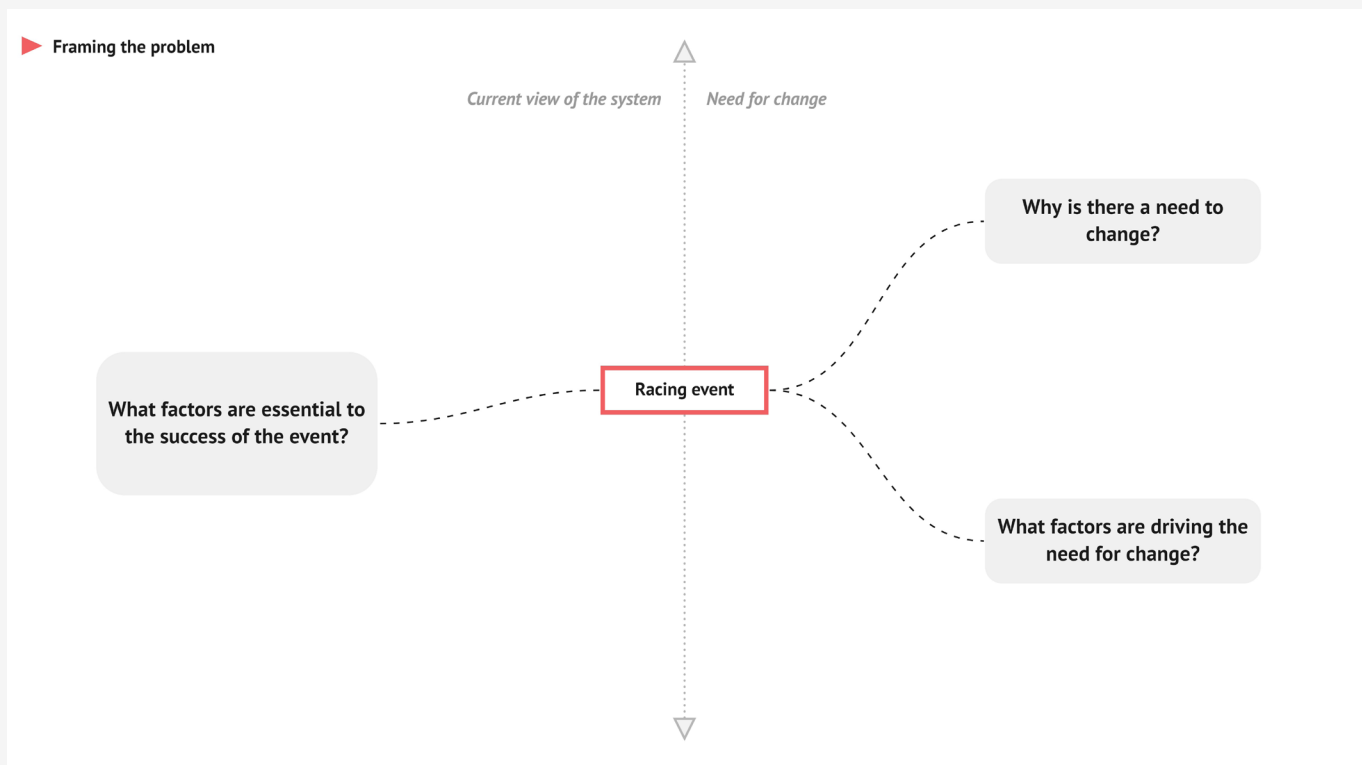
Figure 21: Template F: Framing Exercise

MAPPING THE STAKEHOLDERS AND HOW THEY ACHIEVE THEIR GOALS

Template (I) was used to map what value or goals were important for the stakeholders (identified in template (G)) in the system. What were they trying to achieve by being a part of such an event? The exercise (I) was done in two parts. First, where the stakeholders, their values and goals were mapped and second to find how each stakeholder achieves this goal in relation to each other. (Exploring opportunity area 2) This was important to know because some key stakeholders such as television companies could very well become obsolete in the next ten years. However, they formed an important part of the event and knowing the current relationships existing in the system could help anticipate what the future might look like. An outcome of the second part of template (I) can be found in 6.1.3.

For detailed description on the instructions on use of the templates, please refer to the appendix (See Appendix E).

5.2.3 Limitation of the explorations

Each of these tools and templates were designed to fit within workshops with a relatively short time span of 2 hours. This meant that through requirement 6 in the brief could be evaluated, the activities had to be condensed and only limited explorations

could take place. There was also a lack of opportunity to apply these tools in a workshop with external stakeholders and hence the requirement 5 could not be considered in the design of the solutions.

▶ Iceberg model

Events

Patterns / Trends

Underlying Structures

Mental Models
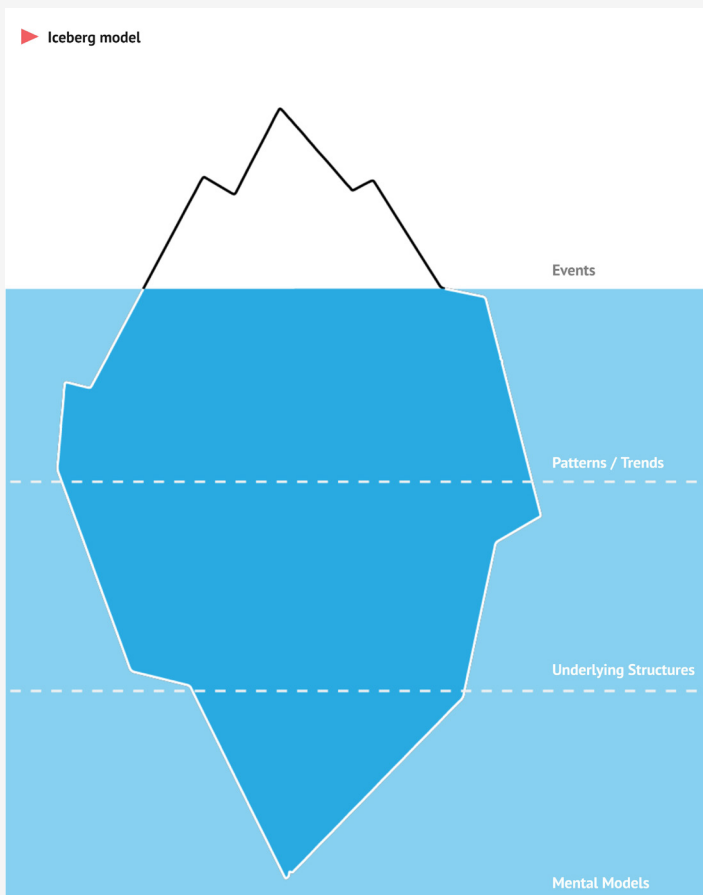
Figure 23: Template H: IceBerg Model

On the bottom
Figure 22: Template I : Stakeholder Goals and Values Map

▶ Identifying Actors, Goals and Relationships

Stakeholder

Goals

Values

1.5 Conclusions and Next steps

This chapter presented the exploration of the solutions in the context of two cases. The end outcomes were templates and exercises that were informed by the opportunity areas. In total, nine of the templates, along with the goals that they were designed for have been explained.

What's next?

The next chapter talks about how the templates and exercises applied in the workshops for each case will be evaluated. It presents the results that were achieved in each case and reflects on how the solutions met the requirements stated in Section 4.2.2. It also forms a bridge to indicate the final outcome of this project overall.

06 Chapter: Executing and evaluating the solutions applied in a workshop set up

Chapter Content

6.0 Introduction

6.1 What results and insights were achieved by applying the templates into action?

6.2 Discussions on results from Case A and B

6.3 How can we further the goal of applying systemic design for VanBerlo?

6.4 Conclusions and next steps

6.0 Introduction

The solutions that were explored in the previous chapter were applied into workshops with designers. In this chapter, the plan for evaluating the solutions is outlined. The results that were achieved within each workshop are discussed to reflect on what interesting outcomes were generated and how the templates and exercises contributed to them. There were also observations made on the design of templates itself and suggestions for improvement will be discussed in the end. Lastly, the insights gathered from the chapter overall lead the way towards the final outcome of this graduation assignment.

6.1 What results and insights were achieved by applying the templates into action?

METHOD OF EVALUATION

The goal of the project was to understand how the design for the transition team within VanBerlo could apply Systemic design into their practice. For this, the exploration of solutions were conducted in the context of two projects and the resulting outcomes were a set of templates and exercises. Each of these templates and exercises were to be applied in the set up of online workshops conducted through Miro with the internal designers in DfT. The outcomes were studied on three levels:

* To observe if the templates met the goals that were formulated within each project as described in table 3 and table 4.
* To learn how the templates and exercises contributed the to outcomes desired in the project and triggered explorations in new ways
* To evaluate the usability and feasibility of the templates and exercises

Each workshop was recorded and during the workshop, observations were made on how the designers were using the templates. I played both the role of a facilitator and participant in these workshops. After the workshop, an interview was set up with at least one participant from every session and an interview guide was used to gather insights from their experience in using these templates (found in Appendix F)

LIMITATIONS OF THE STUDY

Due to limited time available and the workshops also focusing on producing the necessary outcomes promised to the client, some of the activities had to be shortened or done in quick and dirty ways. Adding on, since each of these tools were applied only once in the course of the project, the resulting iterations were only the first versions that would need further testing or re-design to be applied thoroughly in the future.

6.1.1 Results from Case A

The 2 workshops in Case A lasted between 2 to 1.5 hours. Three designers joined from DfT and as a result of the workshop, they were able to achieve both the outcomes promised to the clients for this case (stated in table 3). The overall explorations conducted produced rich and diverse ideas for initiatives and helped the team prepare an overview of all the potential stakeholders who could be involved in the next stages of the project.

In the first steps before the templates were applied, the designers were asked to reflect on what the challenge is and why it is necessary for the challenge to be solved. Some interesting ways to frame the challenge in the form of How Might We were

discussed such as 'how can we ensure the legitimacy of the airport in the region?' or 'how can we allow an airport to become/represent part of the community?' and so on.

The first template (A) was mapped with the insights gathered from the documents shared by the client. At this stage, the designers expressed that they were exploring the context but finding it hard to understand what output this template might offer. But later the results from this were used as material to fill in the template (C) and encouraged the designers to think in terms of connections and identify new opportunities.

For example, in template (A), a negative impact of the airport listed was noise pollution, which meant that neighborhoods couldn't be built around the airport. This also meant that though there was space for urban development, it was not being utilized. Later this same insight was used in Template (C) to come up with an idea for a high end rooftop bar or club near the airport that would be away from neighborhoods to not disturb them and would also encourage people to step out of the city. (see figure 24 below)

The template (C) was used twice in the workshops and the designers were most engaged here, since they were not only mapping what is, but what could be. The insights from Template (B) were used to make some ideas more concrete in the second workshop but the template was

Figure 24: Moving from insights to ideas
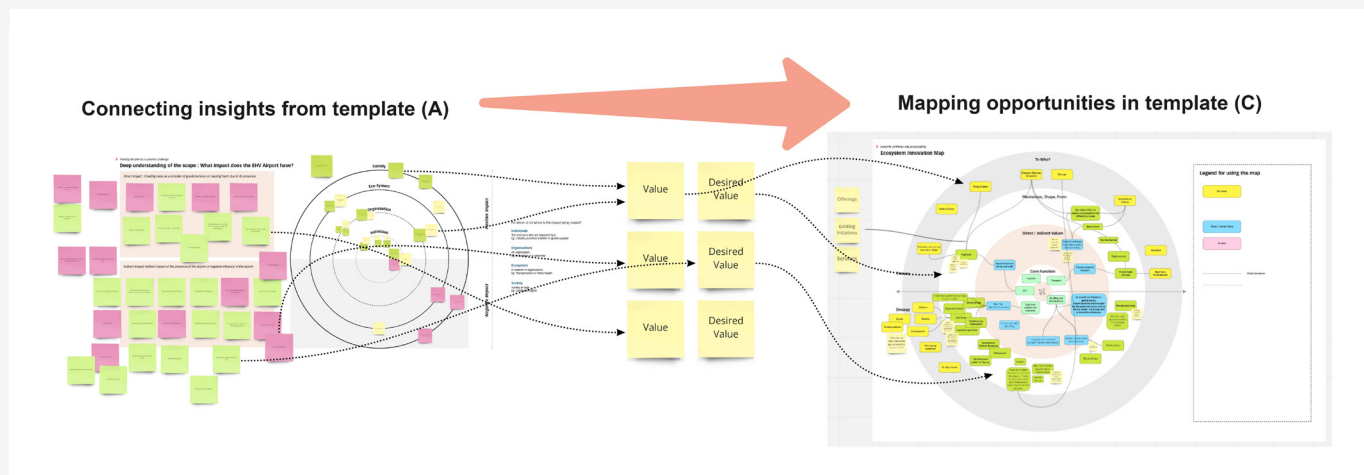
Insight used to sharpen the ideas

Mapping opportunities in template (C) V2.0
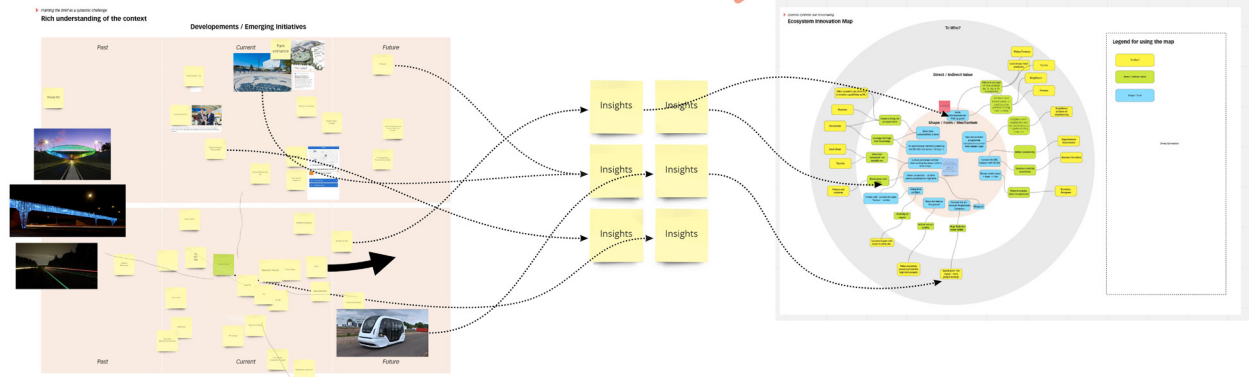
Insights

Figure 25: Using insights from template (B) to sharpen the ideas

Initiative Ideas

Four domains to explore
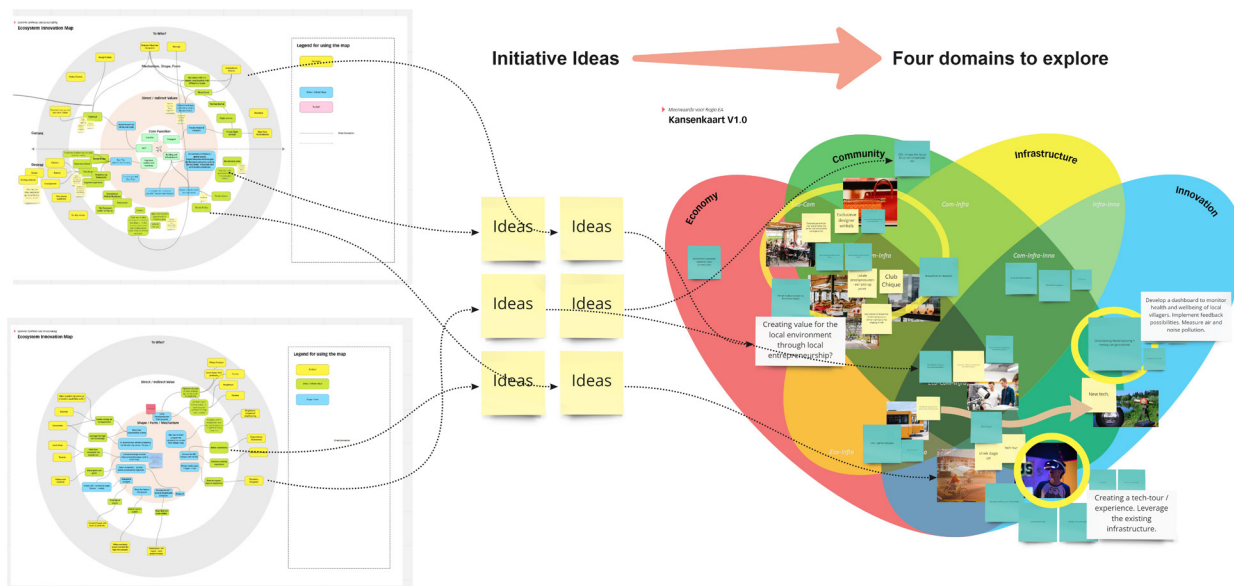
Ideas

Figure 26: Four domains formulated where the ideas generated belonged to

not used the way it was intended to be i.e. to see patterns in the data. This was also harder for the designers to do because they lacked enough information on the context. (see figure 25)

The results of the first session led to the creation of Template (D) that combined four areas derived from analysis of the initiative ideas to build a visual map. This map was further used by the designers to cluster the initiatives together generate new ideas. Lastly, the template (E) was applied to break down the initiative ideas and a large list of stakeholders belonging to different categories was developed (see figure 27).
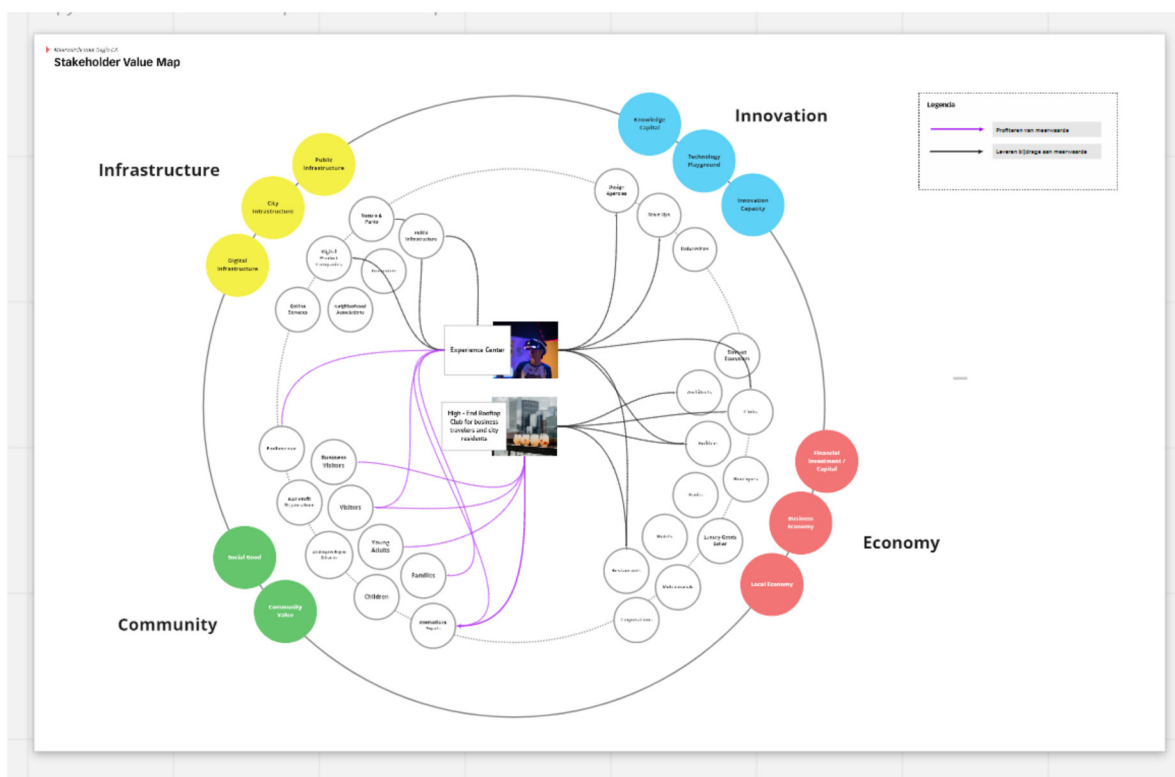
Figure 27: Mapping stakeholders for each initiative

6.1.2 Analysis and insights gained from Case A

FINDING NEW FRAMES TO ADDRESS THE CHALLENGE

The designers noted that the templates and exercises helped the team to zoom out and broaden the perspective of the challenge. Since they were looking at the problem from many different lenses of stakeholders and values and then moved on to more tangible parts of the activity, i.e. the opportunity areas, it tied the whole session together. This way of approaching the problem also changed their perspective towards 'positive opportunities' for various stakeholders.

"Having a zoomed out perspective and deliberately looking at these broader perspectives was useful as kickstarters to think..really in the broader sense"

(Participant Designer)

CHALLENGING THE GOALS SET IN THE CHALLENGE

The designers found value in exploring the templates (A) and (B) because they helped the team think about the goals that they were really trying to address through this project. A good reflection that they took forward was to challenge the client in the upcoming workshop to question if the project was about **'making the airport more relevant by creating new initiatives'** or was it about **'solving the problems caused by the airport'** (such as poor sustainability or noise pollution).

MAKING IMPLICIT ACTIVITIES EXPLICIT TO COLLABORATE BETTER

Using the tools and templates were useful because they made some of the implicit exercises typically done in a design process more explicit. Often each person in a team would process the insights differently according to their own repertoire. But using these tools also meant that they were able to collaboratively frame the challenge together and build on each other's perspectives which are often lost in implicit thinking. In the process, making the rationale explicit could also help in avoiding typical fallbacks in a design process such as a tunnel vision on stakeholders or ideas.

"Often we are bringing value to the same stakeholders repeatedly and sometimes we are skipping out on the stakeholders but this makes it very explicit."

"Looking for the underlying question or re-framing that are things we do, but they are very implicit...it happens coincidentally. But plotting everything is not something you do a lot, because we don't get so much knowledge but we rearrange knowledge. This really helps to make use of this knowledge now"

(Participant Designer)

VISUALIZATION FOR CONNECTING INSIGHTS

Visualizing data at hand through a map helped the designers to connect the dots together. Since in this case the challenge was to look at the geographical region, mapping the proximity of things helped to trigger new explorations. Though some exercises such as mapping values and mechanisms were very new and novel, they required effort because this was not a practice that is typically conducted in their process. However, this was later noted as important in helping them to describe the complexity first before simplifying it.

"Sometimes making it visual

doesn't make it easier for us as compared to just thinking about something, but that's good because it is very complex and should require time and effort to come up with a solution"

(Participant Designer)

GENERAL THRESHOLD IS LOWER IN USING THE TOOLS + FUTURE USE

Both the designers who were interviewed noted that with few better explanations, the tools could be easily applied in other workshops. Some tools such as mapping stakeholders in template (E) and dissecting the value in a system (template (C)) could be applicable into many projects, even if that was not a necessary output expected by the client but more to enrich their own process.

"There is low threshold to use the templates, a couple of lines of explanation and you are able to do a quick exercise"

(Participant Designer)

Room for improvement

LIMITED TIME TO EXPLORE THE TOOLS

The time that was assigned for each activity felt rushed, since there were many templates that required the thinking. This could be a result of the set up of the workshop being online or due to several resource (time, knowledge) intensive activities placed together at once.

SOME EXERCISES WERE HARD TO DO

Even though some templates seemed accessible, there were some steps in the process, such as carrying forward the insights from template (A) into template (C), which the designers felt were hard to do. This was because the templates were structured in particular ways in the workshop to lead the participant from using one to the other.

"I've never done it this way before, so..it was new to me and maybe even though we were exploring, because it was structured in a manner to get to somewhere, it was harder to do.."

(Participant Designer)

There was also difficulty due to the presence of some terms that mean different things to different people, such as mechanism or infrastructure. These explanations could be improved on or changed depending on who was using the tools and the general instructions on the activity itself could be improved.

6.1.3 Results from Case B

The 2 workshops in Case B lasted 2 hours and 1 hour each. The set up of this workshop was much more informal with more exercises instead of templates. This was to encourage open explorations and to keep things simple as compared to the templates/exercises designed in case 2. There were also only 4 activities planned and this meant there was enough time for exploration in each activity.

The Miro environment also came in handy to facilitate the visualizations without the use of a template.

Applying template (G), which was an event mapping exercise (see figure 28 below) helped the designers to go back to the initial questions of the challenge i.e. to How does the racing event take shape? Through this they uncovered hidden activities that were occurring in the event in all its stages, i.e.

Figure 28: Mapping the series of activities taking place in the event

Dissecting the factors using the ice berg model
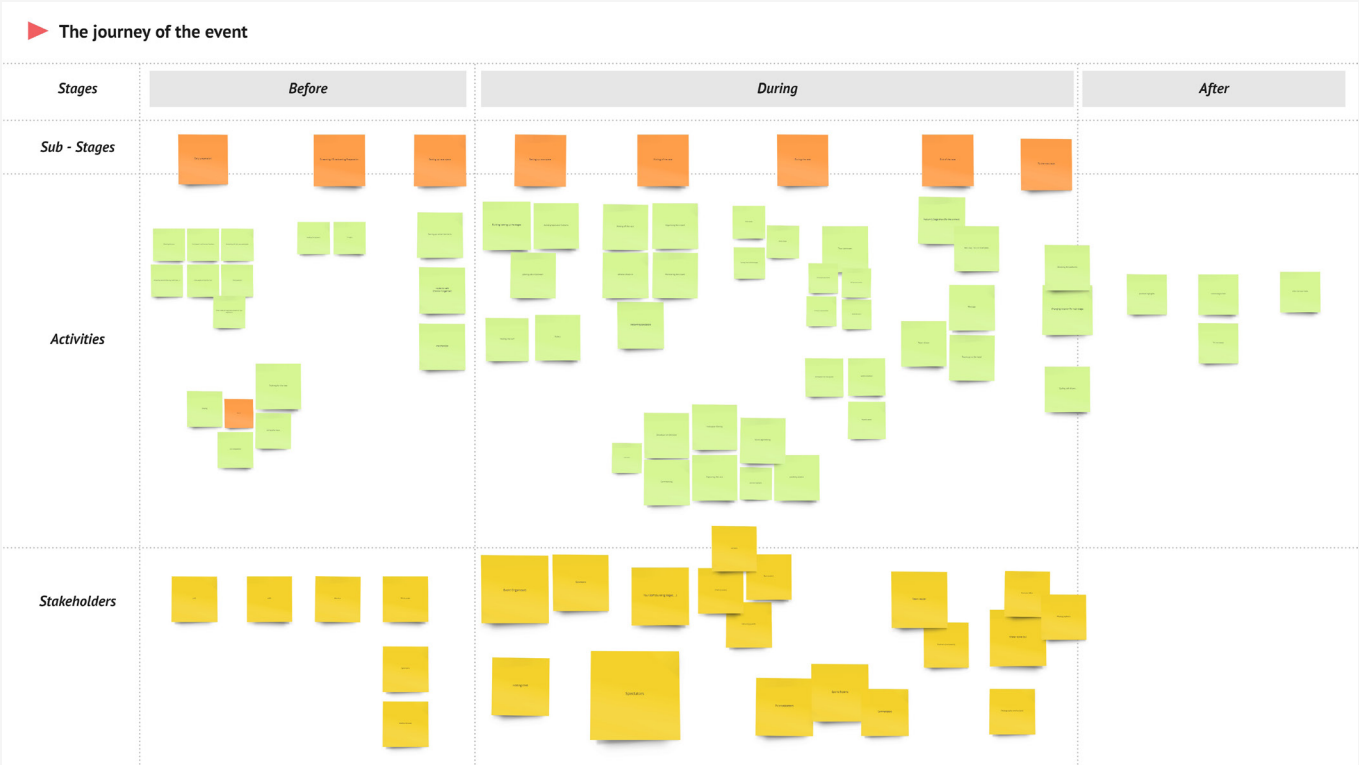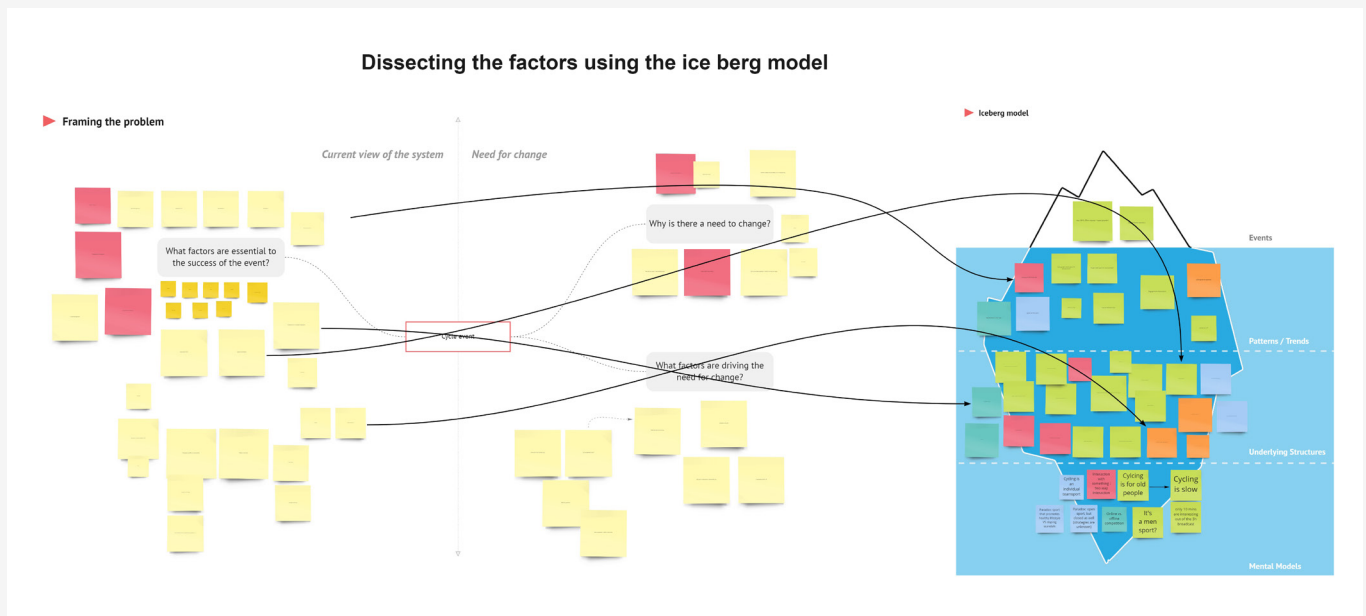
Figure 29: Understanding the most important factors that are effecting the event

Mapping the stakeholder goals in relation to each other

Figure 30: Mapping stakeholder goals in relation to each other

before, during and after. In the end they were able to identify new stakeholders that were previously not considered in the project, such as the team leader of the cycling team who was critical in training the cyclists.

The next template (F) was a framing exercise to probe the designers to think on what the need for change was or evidence of change in the event. Through this exercise they arrived at very interesting insights that were unexpected by the project owner. These insights were from the dwindling spirit of the sport to battle for attention because of faster, shorter sources of entertainment. The designers were excited to dive further into these factors using the iceberg model (H). (see figure 29)

Lastly, the template (I) helped them to map the goals and values of the stakeholders identified earlier (see figure 30). This then was used in the next activity to determine how each stakeholder achieves their goals in relation to each other. Apart from transactional relat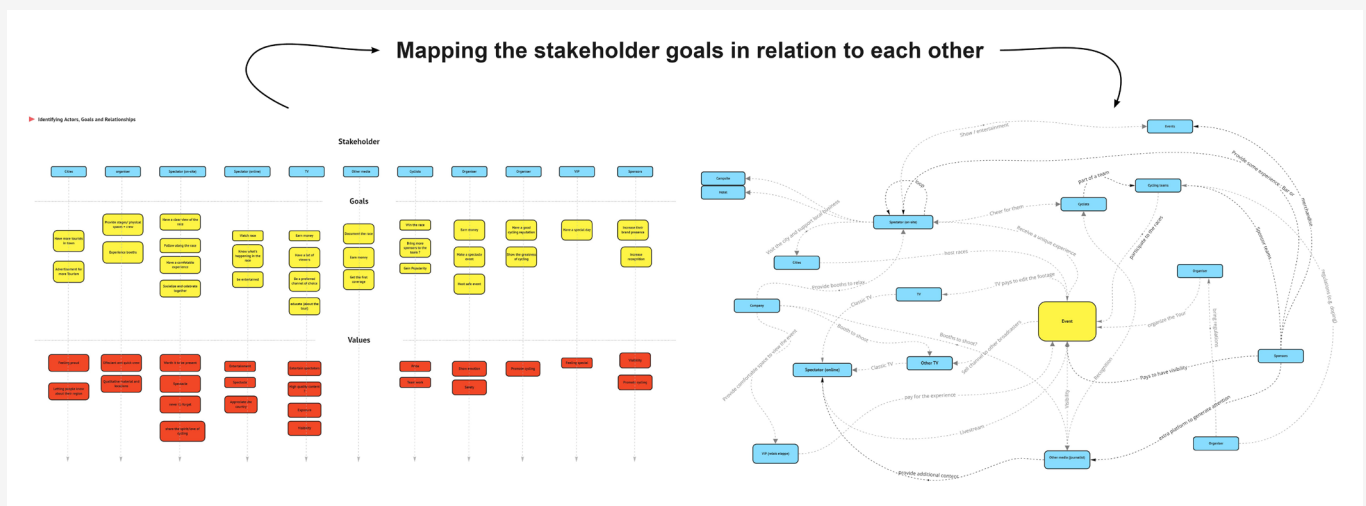ionships, such as exchange of resources, there were also relationships on a human level that were mapped. For example, a cyclist is part of the team because he values the feeling of pride and teamwork. There were also conflicting relationships observed where the bicycling event depended on exposure gained from media and journalists, but they were also

the media was also the key contributor in tarnishing the event's image.

All of these insights in the end gave some new directions for the team to proceed on. However, in order to process these insights, it would require another session which will be conducted in the future.

6.1.4 Analysis and insights from Case B

DO WE KNOW THE SYSTEM WELL?

The exercises were helpful in understanding and framing what events and activities were taking place in the race. However, when the race was studied in detail, the designers realized that they lacked some key stakeholder perspectives on the problem. They found it important to conduct some of the exercises and tools at the start of the project. This way they could shape the project scope together. There was also currently a lack of representation of the right stakeholders in the internal workshop that was conducted. Due to this a lot of the insights were assumption based.

"It made us doubt if we have all the content, because we discovered new things that we did not know"

UNDERSTANDING STAKEHOLDER PERSPECTIVES

Until now in the project, the only stakeholders who were being considered by the team were the organizers, the client company and the spectators. However, through this exercise, the team was able to discover other stakeholders such as sponsors, media companies and young spectators who were influencing the racing event significantly. Exploring these different perspectives also made them question which insights would they tackle moving forward because they most interesting ones were outside the scope of the client organization.

"Plotting down the system helped us question who was actually the customer and who are we designing for?"

(Project owner and designer)

UNCOVERING MENTAL MODELS

The use of the iceberg model brought about the most novel insights according to the project owner. Typically in strategic projects, even though mapping stakeholders was a common exercise, such discussions were not conducted. However, in designing for future scenarios or long term objectives, these can become the driving factors.

"When we started talking about battle for attention (mental model on iceberg), here's where we started having the conversations we never have"

(Project owner and designer)

Room for improvement

TIME VS OUTPUT

As a general reflection, the designers felt that even though the exercises were helpful, they took much longer than the activities typically done in a project. If such a session was conducted with clients, this would take away half the day and they still wouldn't have achieved the outcome promised in workshops i.e. future scenarios.

WHAT ARE WE GOING TO ACHIEVE THROUGH THIS?

Since these exercises were exploratory, there was a lack of clarity while doing the exercises on what sort of outputs might be valuable to the client. This was important and could be made more explicit before the template was being used. They also felt like some exercises were interesting but took time. If there was a way to make it fast paced, that could be more valuable.

6.2 Discussions on results from Case A and B

Overall, the templates offered value in enriching the design process applied in each of these cases. By referring back to the requirements that were set in section 4.2.2, the following reflections were made.

THE TEMPLATES AND EXERCISES PROMOTED NEW PERSPECTIVES, BUT WERE THEY DESIRABLE?

The tools and their use was found to be interesting by the designers who participated in both the workshops. And though they recorded new perspectives (requirement 2), there was still a lack of clarity on whether a systemic design approach was desired by them. One of the key factors was the investment in time that each activity took. A designer mentioned the following:

"At VanBerlo, In 20 percent of the time, you do 80 percent of the work. So in 80 percent of the time, you do 20 percent of the work. Very quickly, you can have a general understanding, and then you spend a lot of time getting the details right."

This also reflects in their design methodology that is focused on converging rather than exploring. Some of these templates that presented more tangible outputs and could be modified (Requirement 3) such as Template (C) would be interesting to be used moving forward in the other projects. For the final outcome (in chapter 7), only the templates that were said to be useful in other projects have been included.

APPLYING THE TEMPLATES WITH EXTERNAL STAKEHOLDERS

None of the tools could be tested or applied in the case of stakeholder workshops. But the output and filled templates from Case A were presented in a client workshop. Due to lack of time and misalignment between all the client parties involved, the workshop had to be cut short into a discussion instead. However, presenting results from the value map (template C) and opportunity map (template D) helped the clients to broaden their perspective on what kind of outcomes could be expected from the project overall. It also resulted in the team getting extra budget to further continue in exploring the scope of the project.

This became a point of conversation for them to consider the applicability of a systemic design approach and the use of the templates further. The team leader, who was also a participant in the workshop noted that

6.3 How can we further the goal of applying systemic design for VanBerlo?

these were only the first steps and would require a change in the way they do things in order for it to be fully adopted.

IMPORTANCE OF A FACILITATOR

During the workshop and in the interviews with the designers, the topic came up if the templates and exercises were meant to be the tools or was I as the facilitator with knowledge in systems supposed to be the tool. This was a critical reflection because the templates on their own were not triggering them to think in new ways, but it was important to facilitate the use of the templates in the right manner. This meant that the end solutions also had to consider this in mind.

In order to make the templates more accessible to the team so they could be applied in other projects, it was decided to create a common repository of these templates with instructions. One of the things that was important for the team was to be able to modify and apply these templates within future workshops. This also meant that a future solution should enable a designer to act as the facilitator in picking the right templates and offer flexibility in the format (time, steps, level of depth) of which they can be applied.

Hence, as the next steps, it was decided to build a guide which could help DfT to apply the templates and exercises in future projects to introduce a systemic design approach in their design process. Currently, these templates were designed to be Miro friendly and the same format was decided to be carried forward because they allowed for flexibility in modifying the design of the templates, if needed. In the next stages of the project, the templates and their design will also be iterated on from the feedback received, to be included in the final version.

1.5 Conclusions and Next steps

This chapter outlined the results of applying the solutions designed in chapter 5 into two cases. Some positive results were achieved through the use of this tool, but the templates and exercises lacked the feasibility in the process. In order to support the designers in using these tools and applying the templates as per each case in the future, a guide that instructs on using these templates and exercises was proposed.

What's next?

The next chapter presents the final outcome that was delivered to DfT.
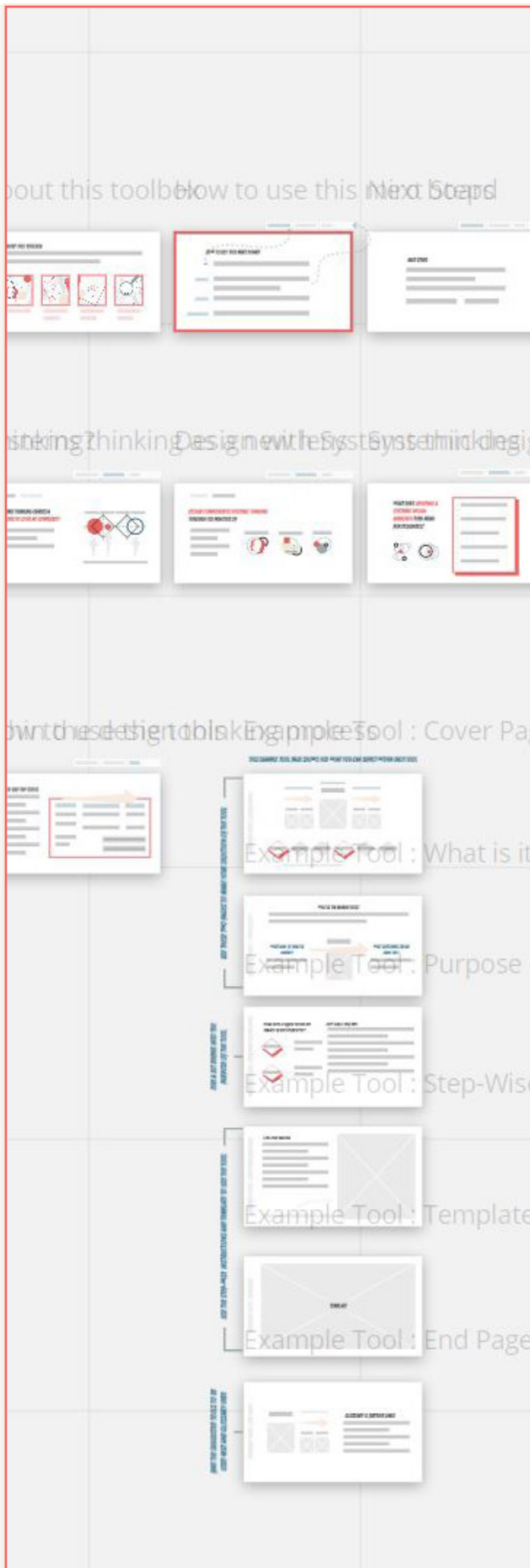
07 Chapter: Bridging from proposal to action: A systemic design toolbox

Chapter Content

7.0 Introduction

7.1 The Systemic Design Toolbox for VanBerlo

7.2 How was The Systemic Design Toolbox perceived by DfT and the rest of VanBerlo?

7.3 Conclusions: The systemic design toolbox

7.0 Introduction

This chapter outlines the final outcome generated in this project : A systemic design toolbox for VanBerlo. The toolbox, its components and the use of it have been explained in the chapter. The toolbox was also validated and tested to some degree with the DfT team and the rest of VanBerlo. The chapter ends with the limitations and recommendations for the final concept and paves the way further to the final conclusion of the thesis.

7.1 The Systemic Design Toolbox for VanBerlo

So far in the project, the research explored how VanBerlo could apply systemic design into their approach. The resulting outcome were four opportunity areas, that combined insights from systemic design and from DfT's current design practice, to propose how systemic design could be applied into VanBerlo's process. These four opportunity areas were further explored in the context of two design challenges faced by DfT. These explorations led to the design of 9 templates and exercises that were tested with designers in the design process of each challenge. In order to further enable DfT to apply these templates into their own practice in the future, it was proposed to create a guide that could allow the designers to make decisions on which templates to apply depending on the future case and instruct them on how to use the templates.

From the 9 solutions designed in case A and B, only 7 of them were taken forward that either offered scope for further growth or were stated as valuable by the designers interviewed. By combining these 7 tools, a systemic design toolbox has been created (See figure on the right).
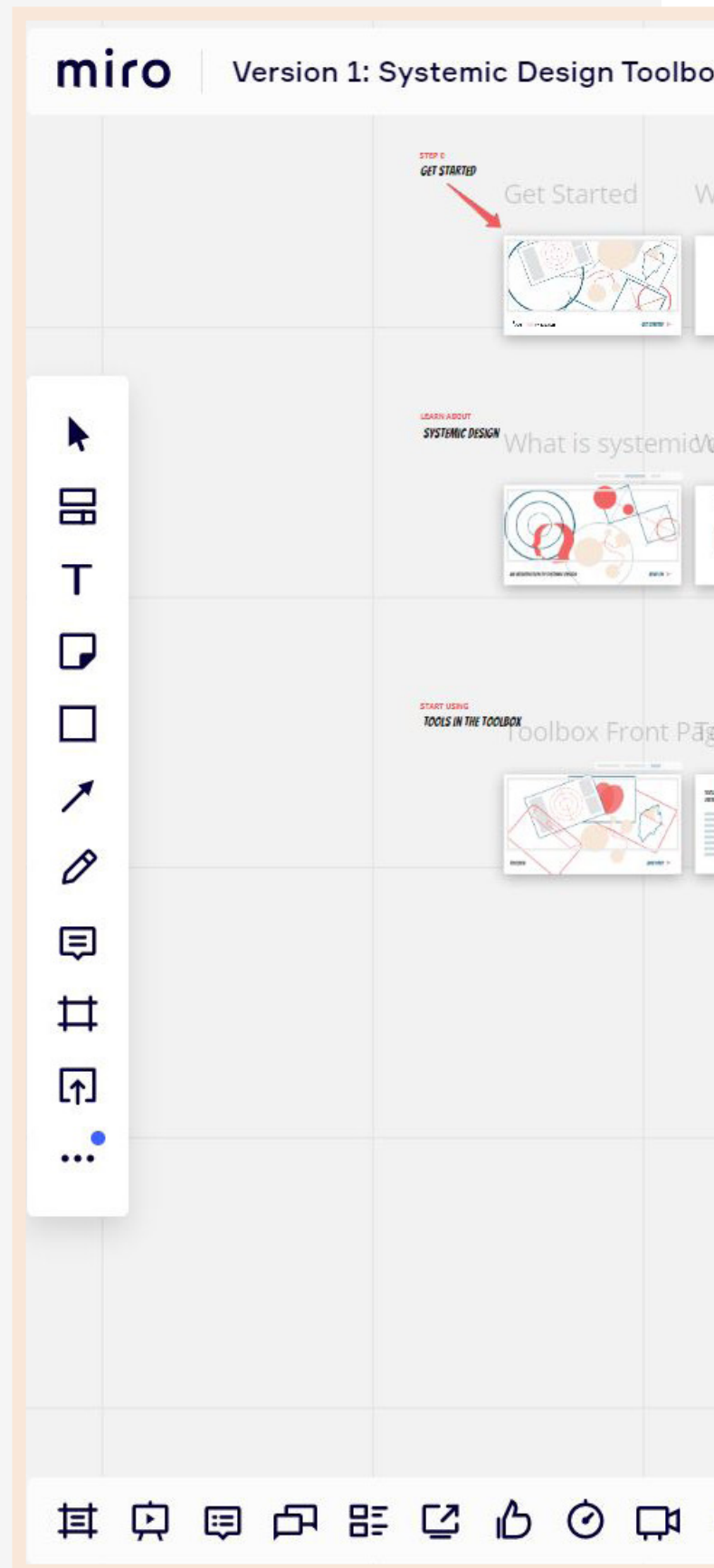
Figure 31: An overall glimpse of the systemic design toolbox

Welcome

About this toolbox

About this toolbox

How to use this

Next Steps

Design systemic / What is systemic design? / What is systems thinking? / Systems thinking / Design with Systemic design / Systemic design / Design Toolbox / Design challenge

Tools Overview

Tools overview

How to use these design thinking examples

Example Tool : Cover Page

System influence map : Cov

Example Tool : What is it?

System influence map : Wh

Example Tool : Purpose of the tool

System influence map : Pur

Example Tool : Step-Wise Process

System influence map : Ste

Example Tool : Template

System influence map : Ter

Example Tool : End Page

System influence map : End

SYSTEM INFLUENCE MAP

WHY A TOOLBOX?

The goal as defined in chapter 4 was to allow the Design for Transitions team to take their first steps towards applying systemic design. The templates and exercises that were designed and applied into practice in the previous chapters already offer these first tangible steps. This toolbox helps to translate the templates and exercises, into the form of tools that offer the necessary knowledge and flexibility required to help a designer in putting them into action for future projects.

DfT designers are already experts as designers and facilitators, however they are beginners in Systemic design knowledge. A tool in this toolbox is essentially a package of templates plus knowledge on when the tool can be used, what output can be expected, where in the process the tool can be applied and instructions on how to use them. It helps a DfT designer as a facilitator to make decisions on which tools can be suitable to be applied depending on the case being addressed and the outcomes that are desired. These tools can be used in any order and do not follow a set methodology. The designers are free to choose the tools depending on the need in a project and the amount of time that might be available. Hence, this is a toolbox and not a toolkit (that guides a user stepwise on using the templates).

Overall, this toolbox aims to meet the requirements that were set in chapter 4, by making it an accessible resource for not only the designers in DfT but for any one who might be interested in systemic design within all of VanBerlo (requirement 1) and allowing designers to be flexible in applying these tools (requirement 3). The toolbox is also aimed to be a growing repository and as DfT builds more towards exploratory approaches in their design practice, they can continue to keep this repository updated.

WHAT DOES THE TOOLBOX CONSIST OF?

The toolbox has been developed in the Micro environment. It first guides a beginner on some knowledge about what systemic design is and where to what contexts can systemic design be well suited for. The actual toolbox section offers an idea of how the tools connect to Vanberlo's existing Design Thinking process (See Figure 33). This is important, as it allows a designer to make decisions on which stages within their current process can they introduce the proposed tools or make a selection of tools depending on the stage of the process they are at.

On the right

Figure 32: Overview of all the tools

Figure 33: Tools connected with the Design thinking process

TOOLS OVERVIEW

The current tools in the toolbox were either designed or used in the duration of the graduation project.

However this toolbox is treated as a growing library that will continue to expand as we explore and build capacity in dealing with complexity.

SYSTEM INFLUENCE MAP	SYSTEM CONTEXT MAP	SYSTEM VALUE MAP	STAKEHOLDER VALUE MAP	OPPORTUNITY MAP

FRAMING EXERCISE	ICEBERG MODEL	FUTURE TOOLS..	FUTURE TOOLS..	FUTURE TOOLS..	FUTURE TOOLS..
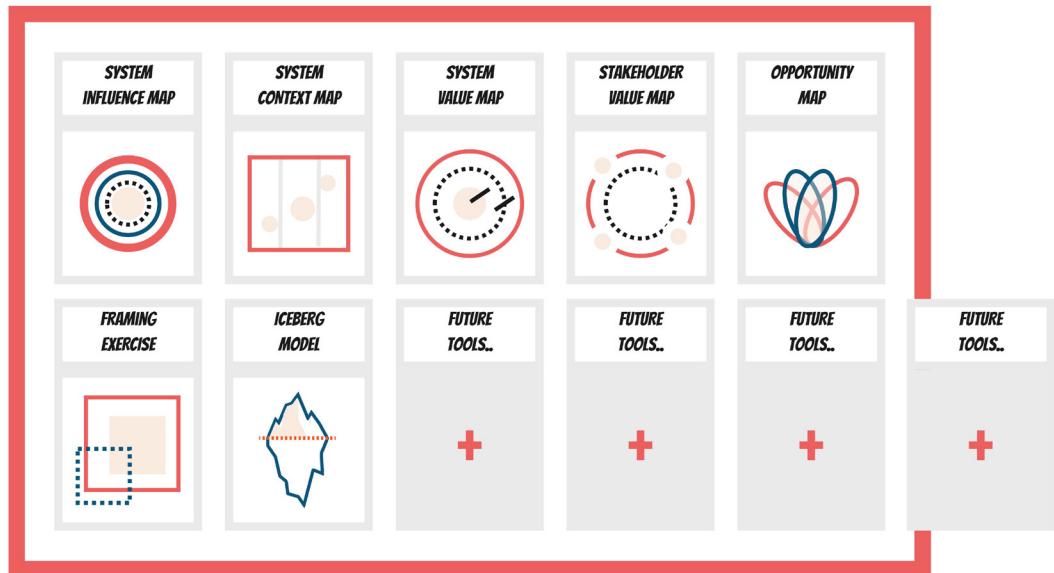
TOOLS OVERVIEW WITHIN THE DESIGN THINKING PROCESS

Some of the tools can be applied within different stages in the Design thinking process. This diagram gives an overview of the same.

SYSTEM INFLUENCE MAP	SYSTEM CONTEXT MAP	SYSTEM VALUE MAP	STAKEHOLDER VALUE MAP	OPPORTUNITY MAP

Explore   **Scope**   **Understand**   **Ideate**   **Validate**   **Implement**

FRAMING EXERCISE	ICEBERG MODEL	FUTURE TOOLS	FUTURE TOOLS	FUTURE TOOLS

Example Tool : Cover Page
THIS EXAMPLE TOOL PAGE SHOWS YOU WHAT YOU CAN EXPECT WITHIN EACH TOOL

Example Tool : What is it?

Example Tool : Purpose of the tool

Example Tool : Step-Wise Process

Example Tool : Template

Example Tool : End Page

SELECTION

DESCRIPTION

INSTRUCTIONS

USE THESE TWO PAGES TO MAKE YOUR SELECTION OF THE TOOL

DIVE A BIT DEEPER INTO THE PURPOSE OF THE TOOL

USE THE STEP-WISE INSTRUCTIONS AND TEMPLATE TO USE THE TOOL

FIND THE SUGGESTED TOOLS TO BE USED NEXT AND GLOSSARY HERE

Next, each tool and the elements within it are explained to give a first time reader an idea of what to expect. It can also act as building blocks for adding new tools in the same format as the repository grows further (See figure 35). Lastly, each tool has been designed with a flow, where the first two pages offer a quick selection criteria for the design, the next page directs them to a detailed description and lastly, the templates and instructions on how to use them are presented (See figure 34). Both the cover page and last page of the toolbox feature a guide on which tools can be applied before or as follow up on the current tool. (See Figure 36)

WHO WILL USE IT?

This toolbox is intended for use by any designer within VanBerlo who might be interested in exploring a systemic design perspective. The key stakeholders in mind were the Design For transitions team, but the toolbox is also meant as a way for the studio at large to sensitize themselves to such new approaches and to already see practical tools or case studies that show a promise of it in the future.

The full Miro toolkit can be found in the appendix G.

Figure 34: The flow of information within each tool

HOW TO USE THE TOOLS

The toolbox contains the following blocks within each tool to help learn about the what (is the tool), why/when (to use) and how (to use) of the tool. To determine if the tool is a right fit to answer your challenge, start with the what. Or you may look into where you are in the Design thinking process and pick a tool that is suitable to the stage you are at. Once you've made the selection, the 'how' section guides you into a step wise process with ready to use templates that can be applied as per available time.
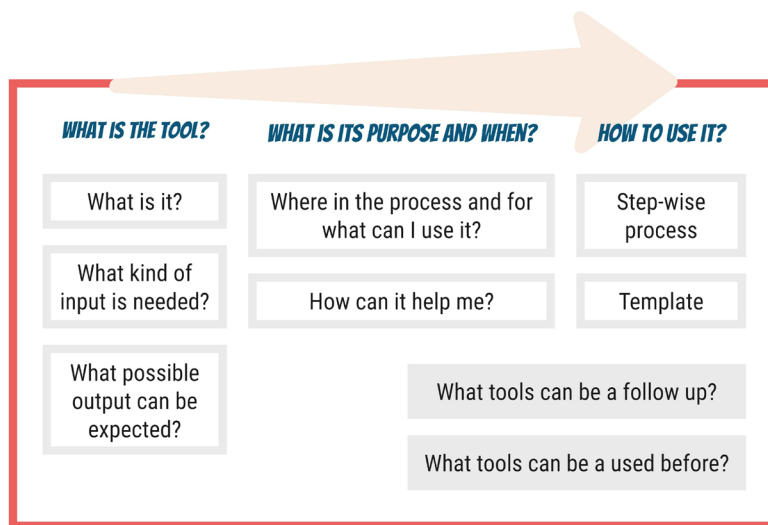
WHAT IS THE TOOL?

What is it?

What kind of input is needed?

What possible output can be expected?

WHAT IS ITS PURPOSE AND WHEN?

Where in the process and for what can I use it?

How can it help me?

HOW TO USE IT?

Step-wise process

Template

What tools can be a follow up?

What tools can be a used before?

Figure 35: Blocks that can be found within each tool

SYSTEM INFLUENCE MAP: COVER PAGE

Back to Tools Overview

Suggested tools that can be used prior

SYSTEM INFLUENCE MAP

Suggested tools that can be used after

FRAME THE CHALLENGE

SYSTEM VALUE MAP

Explore   Scope   Understand   Ideate   Validate   Implement

SYSTEM INFLUENCE MAP: END PAGE

SYSTEM INFLUENCE MAP

Suggested tools that can be used after

SYSTEM VALUE MAP

GLOSSARY & FURTHER LINKS

- **System:** A system is a group of components that are united by an intended purpose. For eg: A system can be at a larger scale, such as a government or at an organisational scale, such as a company or even at a micro scale, such as a mechanism within a product.
- **Sub-system:** A sub-system is a set of components that form a system and the sub-system as a whole is also the component of a larger system. For example: Exams are a sub-system within the school system.
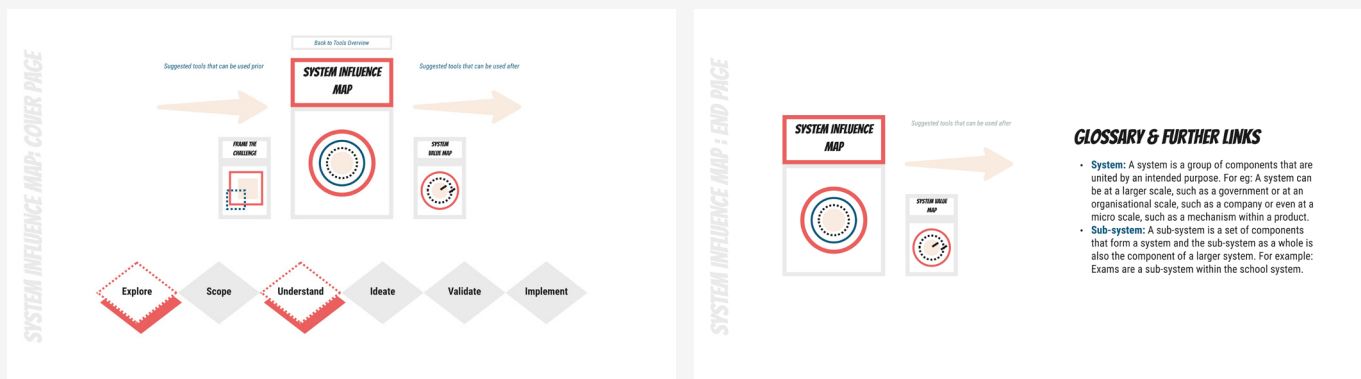
Figure 36: An example of a front and last page of the tool

7.2 How was The Systemic Design Toolbox perceived by DfT and the rest of VanBerlo?

APPROACH

In order to validate the desirability, viability and usability of this toolbox for VanBerlo, it was decided to conduct interviews with 6 designers from all of VanBerlo who belonged to different domains. These participants were chosen because of their expertise in topics where systemic design has been applied in academia/practice and could be relevant for their field of work. They were experts in topics such as service design, circularity, design research and so on. Table 5 indicates each interviewee and their backgrounds:

Table 5: Final validation study participants

| Interviewee	Number of interviews + duration
Senior Strategist with Design for Transitions	1 (30 minutes)
Design Research lead	1 (30 minutes)
Expert of Circularity	1 (45 minutes)
Expert on Service design	2 (30 minutes)
Team lead	1 (30 minutes)
Strategist, expert on future scenarios	2 (30 minutes)

An interview was set up with each of these designers. Before the interview, they were asked to review the toolbox and reflect on some questions that are indicated in the figure 37. For the interview itself, an interview guide was prepared found in appendix H. The designers were also made to reflect on how they would use these tools in their next or ongoing projects and what their approach would be in using the toolbox itself.

7.2.1 Insights

DESIRABILITY OF THE TOOLBOX

The toolbox and its format was very positively received by all the designers. They found it valuable to have a common platform where all the tools and resources needed can be listed. For many years they desired to make a common repository of all the tools used across VanBerlo. And this toolbox could now serve as inspiration to get started on the larger goals. Currently, in their practice, if they needed advice or instructions on using some tools, they had to either ask their colleagues or refer to old documents. But such a platform can bring everything together in one place.

Figure 37: Feedback questions listed on the Miro before the interview
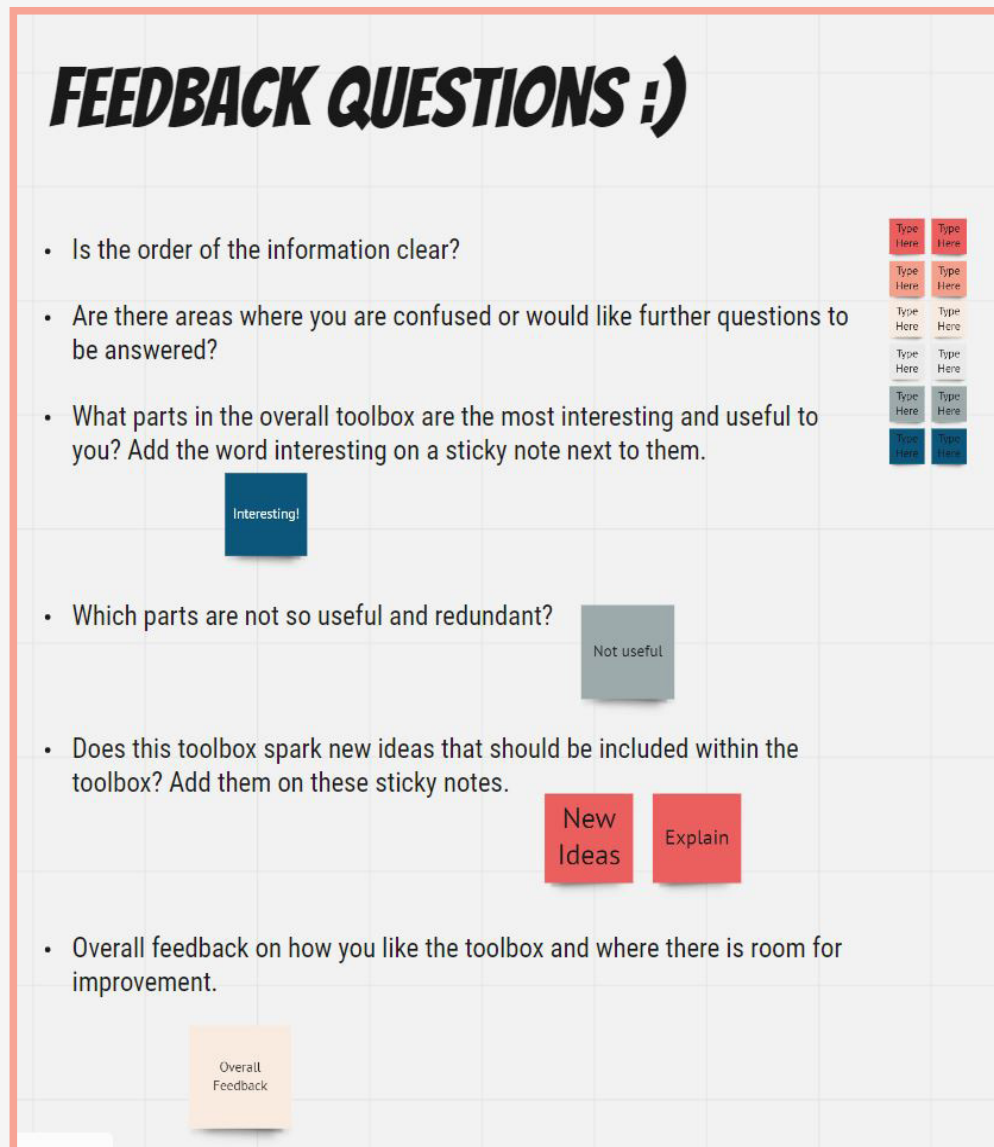
"Well, first of all, I thought it was super interesting. So, because we never have this overview, and it's terrible...and we cannot find anything, people don't know where to look also. So that's First of all, big compliment."

(Team Leader)

"Yeah, I think it would be sort of or it could function as a sort of a backbone for facilitating or processes in terms of tools and methods that we are applying."

(Design research lead)

VIABILITY OF THE TOOLBOX

The organization was currently in a phase of merger with another company. At this stage, they found the toolbox and its contents very relevant because now they could share their knowledge and way of working/collaboration with the external partners who will soon join them as colleagues. They also could add these tools as quotes within project proposals and show their capacity in it to clients.

"Then that helps a lot that people know what they can expect from us. And they're like, okay, you have some kind of expertise, because you have the tools developed for it. Yeah. So that works in a lot of on a lot of levels!"

(Team Leader)

DIFFUSING SYSTEMIC DESIGN WITHIN THE ORGANISATION

The tools were looked at as practical approaches towards applying the new perspective within their practice. It could encourage people to learn by doing instead of starting from a theoretical angle.

"You will find it, oh there is more to it, or to this problem or to this context, or actually my project topic is a system...that's like a way of looking at and it will probably grow through the use of this. Instead of the other way around that you will have

to already have developed that (systemic) lens for yourself and then recognize it and then choose a tool for it. I think this kind of lures people into trying it out and then learning that there is so much of a systems perspective behind it."

(Team Leader)

VISUAL STYLE, CLEANLINESS AND THOROUGHNESS

The visual style of the toolbox being simple and inviting was also appreciated. The tools themselves were found to be very thorough by each participant. And the way of selection was very helpful by aligning it with their current Design thinking process.

7.2.1 Limitations of the toolbox

LACK OF PRACTICAL INFORMATION

One of the things noted was a lack of practical information on how the tools should be applied, especially within external stakeholder workshops. There could be more details on how people could use a tool, how much time it might need, what is the budget, what information is required beforehand and so on. However, each tool was meant to be selected and used by the designers in a format that suits the case they were addressing. Building practice in applying the tools in the right manner might take trial and effort, for which there might only be very few opportunities available.

LACK OF KNOWLEDGE ON WHERE TO APPLY THIS APPROACH

It was also found challenging by some of the designers to state where they could apply this approach. It seemed like the tools would open up the problem space and they questioned if it's necessary to make a project more complicated on purpose. It was also hard for them to say if the toolbox should be referred to before the project started or during the time when a project is running.

"There might be projects that can be treated systemically, but require a meta level reflection which is not being applied right now"

(Senior Strategist)

"To what extent do I want to actively stretch projects to becoming systemic? And to what extent should we not make it more difficult than it is at some point? That? I don't know? I don't have an answer for that"

(Team Lead)

CANNOT USE IT WITH CLIENTS YET

Because the testing and design of the templates was conducted for internal designers, the tools and the toolbox did not have any information on how these tools can be used or shared with clients . However, if this toolbox could also be shared with external clients and was designed for this purpose, the use of it could increase significantly.

IS VANBERLO READY FOR USING THESE TOOLS?

Even though the tools themselves were seen as valuable, their application right now was considered to be limited within the current practice of VanBerlo. One impression that was common between the designers was that opening up the problem space, which these tools facilitated was lacking as a general demand within their projects. There was also a need to thoroughly sensitize people on taking a systemic approach, what benefits it might offer, what is the business value for applying this perspective and what could the clients gain from engaging in such projects.

"But that's just like how many projects we do where we can actually apply it. On the other hand, I can imagine that we just need to advocate it."

(Team lead)

"I think in terms of the market within VB as an agency, I would still call it extremely..how do you say it, juvenile when it comes to a more strategic

focus on projects or more systematic levels.., if you have the same form of an agency that really does focus on such projects, which are much more innovative in the larger sense of scope, then these might apply well."

(Service Designer)

7.2.3 Recommendations for future development

CREATE A BOOT CAMP OR WORKSHOP THAT ALLOWS DESIGNERS TO GET INTRODUCED TO THE TOOLS

In order to build familiarity in the use of tools and allow designers to further apply these tools into practice, a workshop or bootcamp can be set up where the tools are introduced in the context of a mini case. Such workshops can invite clients to raise an open question, for which VanBerlo performs this approach. Currently, the use of the tools and the toolbox was seen as being far fetched. However, some of the tools could be valuable, as seen from the application of

them in the two cases but require sensitizing the designers on the same.

TRANSFER TO A MORE FLEXIBLE PLATFORM

This tool box was currently designed for the Miro environment. However, it currently presents limitations in terms of sharing or the amount of data cannot be managed well. Turning this toolbox into a platform such as a website can also allow it to grow as larger tools within vanberlo are connected to this toolbox. It can also offer more opportunities for collaboration to occur between clients and the internal design team where some parts of the platforms could be exclusively designed for pitching to the clients on this new way of working.

USE AND ITERATE ON THE TOOLS

Currently the tools were only tested once, and a version 1 was created of each. However, these tools could be refined further and the scope of their application can be explored. Some of the tools still require refinement in terms of language and words that could be perceived differently by different people. The glossary in the toolbox can act as the start, but soon as the designers build shared language, they should update this section.

7.3 Conclusions and Next steps

This chapter outlined the final results of this graduation project: A systemic design toolbox for VanBerlo that introduces tools that were designed based on the opportunity areas. Overall, the toolbox itself was able to introduce some first steps that can allow VanBerlo to apply a systemic design approach into their practice. However, in order for the tools to be fully applicable, further explorations and sensitizing designers and clients on the value of such an approach might be required.

What's next?

The next chapter concludes this thesis by stating some final recommendations and limitations of this project. In the end, a personal reflection on the contributions made and the journey of the project are stated.

08 Chapter: Evaluating the Project and Conclusions

Chapter Content

8.1 Limitations and Recommendations

8.2 Contribution and Personal Reflection

8.1 Limitations and Recommendations

LIMITATIONS WITH VALIDATION

The tools and templates could only be validated once in the course of the project. The solutions were also explored in design challenges that themselves were new to DfT's portfolio. This meant that these tools could not be compared or evaluated against another approach. Even though several interviews were conducted with designers to understand the impact of the solutions designed, the larger feedback was received on the broader relevance of this approach for VanBerlo instead of the use of tools and templates themselves. This toolbox requires a step before that can act as the sensitizing phase for Dft and their colleagues at VanBerlo to present the value that systemic design can offer and what it entails.

LIMITATIONS OF PROJECT APPROACH

This project started out with a very broad exploration of systemic design, the application of which is still primarily in academia and translating that knowledge into practice of a design studio was very challenging. The opportunity areas in themselves were valuable to be explored but still offered a very large scope. It could have been potentially useful to focus on one of the opportunity areas for the course of this project and explore how a certain practice, such as visualization, can be established within DfT's design process. Moving further, DfT can explore one of these opportunity areas and learn how they can apply it more in depth into their practice.

RECOMMENDATIONS TO FUTURE DESIGNERS

One of the key challenges that was faced in this project was that systemic design can be applied in many different ways. I myself as a designer, found it hard to choose the first steps I could take in exploring this field. An interesting area to expand further on could be to explore how a systemic design approach can be made more accessible to designers who are a novice in this field and help them to apply the concepts on everyday design challenges that we face. Though this project attempted to do this for VanBerlo, systemic design requires a shift in attitudes such as embracing complexity or being comfortable with uncertainty. These require more than tools and might need more strategies to be introduced.

Currently the business value of Systemic design is not very well known or established. During the end of my thesis, the book 'Rethinking Design Thinking' by G.K. Van Patter was released which is another step towards starting a conversation for the need of designers to adapt to new skills. But showing the value of it for clients is still a process that happens behind the scenes and can be explored further.

8.2 Contribution and Personal Reflection

CONTRIBUTION TO NEW KNOWLEDGE

Through this project it was explored how a design consultancy practicing design thinking can explore the field of systemic design by taking some first few steps. While the opportunity areas themselves were derived from existing literature, formulating them in the context of a design practice was a valuable step towards adoption of systemic design in a studio set up. By the design of the toolbox, I was able to shed some light on the changing landscape of design for VanBerlo and I hope to have inspired them towards pursuing the systemic design path further.

I also believe that a lot of work published on systemic design is about the application of it in solving a challenge. However, I hope this report offers some insight to a curious designer who is interested in learning : 'where do I start if I want to apply systemic design into my process?'. That being said, the practice of systemic design can be most valuable when taught in university settings where we are free to learn and experiment. This way also allows a designer to build the attitudes and mindsets that are required in approaching a challenge from a systemic perspective.

PERSONAL REFLECTION

At the start of the project, I began with a very optimistic and exciting mindset of being able to explore the power of visualization and how it helps in addressing complexity. Through the course of it, my focus had to shift between understanding systemic design at large to translating it into practice through everyday design activities. This project was challenging for me because I had never dealt with a case where instead of addressing the problem on my own as a designer, I was building the path for **other designers** towards addressing the challenge.

I was also faced with high amounts of uncertainty in my topic and the projects within VanBerlo that I would get to work on. I was attempting two goals at the same time, to teach myself about systemic design and to educate others about it and be an advocate for it. Playing this dual role was a tough journey but I am happy to say I have gained considerable amount of knowledge to be confident in being able to tackle a systemic design project in the future and to convince others of its value.

I have always been inclined towards addressing very people centered challenges that require understanding people's experiences and perceptions. Even though I was unable to pursue research in this manner within the project, in hindsight, it made me reflect a lot more on my own self as a designer. Overall my project approach started with a lot of fuzziness and this report

reflects how I made sense of it, which I am very proud of. However, after my design phase, I was unable to connect it back to the earlier parts. Here I felt like I could have gained more value by adding further reflection and analysis into my design process.

My most significant learning was about managing expectations when I'm working with myself and with peers around me. I often attempted for the best and completing this report became a humongous task. But, in the end, I am grateful to have tried, learnt, failed and emerged stronger through this project. It pushed me beyond what a project with the most perfect setting and that suits my skills would have done for me.

I am looking forward to collaborating further with all the people I met through this project, failing some more and eventually becoming a better designer. Hope you enjoyed reading this report!

Thank you!

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Adopting a systemic design perspective within a design thinking practice

Master thesis by **Vinodha Suresh**
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VAN**BERLO** x **T**U Delft