

Systemic Design: Reflections on a case study from the Design for Government course

Working Paper

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Abstract

This paper describes our student project within the spring 2017 Design for Government course at Aalto University in Finland, which we reflect on, as a case study of systemic design. We examine the project processes and our own experiences, using Alex Ryan's Framework for Systemic Design (2014) as a lens to aid in this process. Specifically, we use the framework's view on methodology and method as tools for reflection. We found that the reflection and generation part of our process would have benefited from more formalized methods and activities. The inquiry and framing were very well supported and employed a wide array of methods. The overall impact of the final proposal is not clear, but the project can be deemed a success when considering the learning experience and knowledge acquired by the team.

Introduction

The public sector is constantly engaging with design, with or without awareness, as it creates and implements policies, and develops and delivers services (Junginger, 2017). In the past decade however, there has been an uptake of more formalized design-based approaches in the public sector. Governments face challenges "that traverse administrative and territorial boundaries" (OECD, 2017, p.12), where complexity and uncertainty are the norm, and where it gets increasingly difficult to identify the causes and effects of said problems (OECD, 2017). These include issues such as climate change, that are addressed through social policies, urban and rural planning, resource management, changes to the food systems, and environmental governance. Treating these challenges solely as design problems is insufficient — there is a need for a holistic approach when framing the issue and proposing interventions. However, the holistic approach inspired by system dynamics practices is also inadequate on its own, as the complexity of the problems "necessitates multi-reasoning and inventive methodologies" (Jones, 2014, p.94).

Systemic design is seen as an integration of two disciplines, design thinking and systems thinking (Jones, 2014; Ryan, 2014; Ryan & Leung, 2014; Veale, 2014) and it is well-suited for problematic situations such as those described above. The fields of design thinking and systems thinking are quite diverse and many schools of thought and practice exist in both of them. (For the purposes of this case study paper, we will not be subscribing to any specific interpretation, but they will be discussed on more general terms later on.) Systemic design is an emerging field of practice. Efforts to define it, frame it, and facilitate applications can be seen in Jones' (2014) *Systemic Design Principles* and Ryan's (2014) *Framework for Systemic Design*. Jones' focus is on a set of principles for complex systems as guidelines for both designers and system theorists; aiming to complement their practices. Ryan's *Systemic Design Framework* presents systemic design as a mindset, methodology and method.

In Finland, the former Helsinki Design Lab and the appointment of a Chief Design Officer for the city of Helsinki (Bennes, 2017) are examples of the rapidly expanding role of design in the public sector. Building on the best practices adopted by the Finnish government and around the world, the Design for Government (DfG) course at Aalto University¹ introduces students to this emerging field of design, by collaborating with the Finnish government in projects that aim to tackle current societal problems. The course acknowledges the need for integrating empathic design and systems thinking when tackling complex problems in the public sector. This paper describes our student project within the spring 2017 DfG course, which we discuss as a case study of systemic design. We reflect on project processes and our own experiences, looking at them through Alex Ryan's framework for systemic design to aid in this process. In particular, this paper explores "How can we understand and describe a case within DfG in terms of systemic design methods and methodology?". The remainder of this paper is divided into three parts: introduction to the case within the Design for Government course; reflections and discussion on the project process using Ryan's systemic design framework; and concluding thoughts.

About the Design for Government Course

Design for Government is a master's level project-based course from Aalto University in Finland. Since 2014, the course has run every year from February to May. It aligns with Aalto University's mission of "building competitive edge by combining knowledge from different disciplines to identify and solve complex challenges, and to educate future visionaries and experts" (Aalto University, (n.d.)). Students with backgrounds such as design, architecture, business, engineering are organized into interdisciplinary teams. The aim of the DfG course is to develop interventions that address complex challenges faced by the government and the public sector (Design for Government Course, 2015). These challenges are assigned to the students in the form of briefs, which are proposed by stakeholders within the Finnish public sector.

In 2017, two briefs were assigned to four teams of four to five students. One of the briefs was called "A Model for Regional Sustainable Circular Food," commissioned by the Ministry of

¹ "Design For Government is a 10-ECTS advanced studio course in Aalto University's Creative Sustainability Master's programme" (Design for Government Course, 2015). The projects are commissioned and paid by Finnish governmental stakeholders.

Agriculture and Forestry, Ministry of Environment, Sitra and Motiva. Since we were working on this brief, we will use our experience as a case study to reflect on the process. Our team consisted of international and interdisciplinary students including Anna-Mia Myllykangas, Elinora Rusthokarhu, Lindsay Simmonds and the authors of this paper.

The Design for Government course features three main methodological blocks. Empathic Design, Systems Thinking and Behavioural Insights are combined in order to “apply empathic approaches to identify stakeholder needs, systems approaches to analyze the wider context of policies, and behavioural insight to identify and design relevant solutions” (Design for Government Course, 2015). Even though the course is structured in blocks, logically and coherently connecting them to ease learning; the nonlinear and iterative nature of problem identification and solution is constantly stressed by the course instructors.

The first methodology introduced is Empathic Design. It is based on the idea that understanding of the users comes from what they say, do and make. In order to properly interpret these data, Koskinen states that both research design and inference are needed (2003). Research design is seen as a step where the data collected inspires design, while inference “produces understanding of the user by building an interpretation of the data” (Koskinen, 2003, p.62).

The understanding of the many times unspoken needs of the users is complemented by a wider analysis of the context, with special attention to policies. Thus, Systems Thinking is introduced. Students are encouraged to understand the connections between events, behaviours and structures (Meadows, 2008) and how they amount to problematic situations. Additionally, students are encouraged to identify areas where interventions can have the most positive impact.

Finally, the Behavioural Insights block is introduced to support the design of interventions in a way that they alter “people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives” (Sunstein and Thaler, 2008, p.6). The students are challenged to consider the ethics of employing behavioural insights.

Each of the methodological blocks outlined above introduced students to a series of methods that helped in developing a final proposal for the brief commissioned, while fulfilling the objectives of the course. Methods such as interviews and contextual observations were taught during the Empathic Design block, systemigrams and the rich picture from Soft Systems Methodology in the Systems Thinking block; and the EAST deck of cards (The Behavioural Insights Team, 2017) in the Behavioural Insights block. (A list of specific methods used, and a more detailed description of them can be found in Table 2).

Project brief and final proposal

The brief *A Model for Regional Sustainable Circular Food* introduced a large, complex and interconnected set of challenges faced by the Finnish food system. It touched upon climate change; its significant consequences on food production and in turn, the contribution of food production to climate change. The brief also mentioned many other problems seen throughout the food system. On the production side, there is a heavy dependence on subsidies, the

soil quality is degrading and the unstable weather threatens the livelihood of producers. Added to that, the use of fossil fuel based products is very high. On the retail side, the system is centralized and it is sensitive to the unstable global markets. While on the consumer side the intake of fruits and vegetables is declining, and obesity is on the rise. Finally, throughout the chain, food loss amounts to 10–15% of all food produced (*A Model for Regional Sustainable Circular Food*, 2017). The brief also asked the teams to consider circular economy as a model to solve these challenges in the context of Forssa, a small agricultural town in the southwest of Finland.

With the use of the various methods introduced in the following section, the team decided to focus on public procurement of food. Our research led us to the following main findings:

- *Only 4% of local farming products is used in Forssa public procurement.*
- *The tendering process for local food is considered burdensome; procurers lack knowledge of writing tenders that emphasise local products locally available produce.*
- *The local procurement agency is dependent on an outsourced domestic procurement circle that buys 95% of the food, and of this most of it is from large, centralised distributors.*
- *Farmers believe their practices are sustainable enough and their mental and physical resources are stretched thin.*
- *Farmers lack incentives to shift towards circular practices because the impact and benefits of circular farming practices are not obvious. Yet, the circular economy is considered to be effective at promoting local food, incentivising sustainable farming, and increasing profitability and job creation. (Cuesta, Marton, Myllykangas, Rustholkarhu and Simmonds, 2017, p.15)*

Based on the issues identified in the Empathic Design and Systems Thinking block, the team proposed an action plan called “Eat Local, Source Local”. This is composed of four interventions; one to kickstart the process followed by three actions.

First, a commitment to sustainable procurement needs to be expressed, by making an explicit modification to the Forssa strategy by transitioning to value based procurement. This strategic re-orientation gives agency and reason for new terms of procurement of food.

The three actions introduce multi-stakeholder collaboration, training and innovation into the public procurement process in the following ways:

- *Training Procurement Specialists teaches them how to design and write tenders that are accessible for local producers.*
- *Collaboration is required to develop understanding about the needs of Procurement Specialists and the abilities and obstacles of local producers*
- *Innovation processes help local producers and Procurement Specialists to create new products and services that help them to compete against powerful centralised producers.*

Between each step in the Action Plan, an evaluation of the process and outcomes measures success against the goals of the Action and Forssa's local food in procurement strategy. (Cuesta et al., 2017, p.20)

Reflection

While the final proposal and key findings seem simple and clear, looking back, the process that led to them was everything but. To guide our reflection of the project process and to better understand the strengths and weaknesses of it as a Systemic Design project, we refer to the Systemic Design framework developed by Alex Ryan (2014). The framework presents three levels of systemic design that are interconnected and mutually supportive: mindset, methodology and method. In this study, we focus on methodology and method. The reflection on the mindset, defined by a set of characteristics, values and habits, is outside of the scope of this paper, as it proved to be difficult to thoroughly evaluate at this time. First, we briefly introduce methodology and methods, and proceed to analyse the case study at hand.

Systemic Design Framework – Methodology

Ryan defines methodology as “an abstract logic that encompasses an entire class of systemic design applications” (2014, pg 8). It includes six main activity types which are: inquiring, framing, formulating, generating, reflecting, and facilitating. Table 1 below briefly outlines the characteristics of each.

Inquiring	This activity type is characterized by investigation and information gathering from a rich variety of sources, including primary, secondary sources from both academic and non-academic origins.
Framing	This activity type is about making sense of information gathered. The learning takes place through selecting, organizing and interpreting the data. A key part of this activity is to make the current framing visible, and then to choose a preferred, more productive frame.
Formulating	Formulation is about the preferred reality, that is “what ought to be” (Ryan, 2014, p. 9). This activity requires value judgements of not only team members, but the integration of the values of relevant stakeholders.
Generating	Generating requires the team to socialize ideas by experimenting — to take them into the real world and learn from their successes and failures.
Reflecting	Ryan (2014) describes this activity to be a critical aspect of systemic design, in which the project team takes an outsider view of their activities. The goal is to learn from looking at what has been done and why. Reflection gives means to reframing and reformulating.
Facilitating	Facilitation is required not only when involving outside actors, but also for the work and activities of the team itself. It also includes visualizing and documenting.

Table 1: Summary of methodology activity characteristics, based on the Systemic Design framework (Ryan, 2014)

Some of the activities take place throughout the systemic design project, and some happen periodically. At the centre of the process is the iterative cycle of framing, formulating and generating, while inquiry, reflection and facilitation happens throughout (Figure 1).

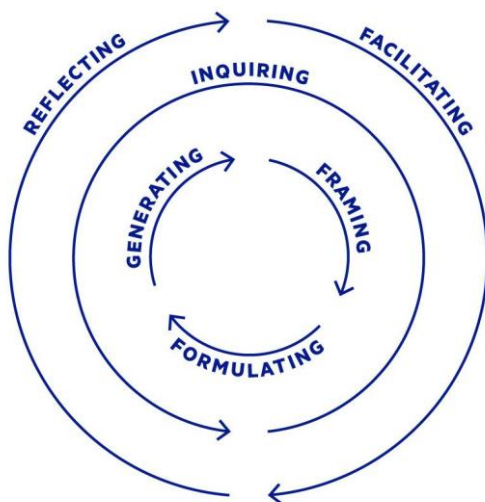


Figure 1: A visual interpretation of the Systemic Design methodology activities described in Ryan's framework.

Case study reflection on methodology

We revisited all the project documentation (including notes, photographs, course structure) and mapped each formalized activity whether it be a major presentation or a session driven by a method. We excluded course lectures and tutoring, because while these activities were incredibly helpful, we see them more as a base-building activity, where we learned new methods, theory, and had a chance to ask questions from instructors. Lectures and tutoring do not fit into the methodological categories presented by Ryan (2014). While this is a simplification of the process as a whole and some of the intricacies and complexities are lost, it nevertheless serves as a helpful starting point for discussion about the nature of the project process.

When we map the formal activities onto a timeline and sort it by methodology (see Figure 2), a few observations can be made about the process. We elaborate on a few of these further below.

- The team had no formalized activity for reflecting.
- Framing, formulating and generating were consecutive, in which after 7–8 weeks of inquiry and framing, we moved to formulating, and at week 11 we began generating.

- The team did continue inquiring and facilitating throughout the process, and used multiple ways to do so. Most of the inquiring, framing and formulating involved some sort of facilitation.
- Inquiry and framing were the most activity intensive.
- Some activities fall into more than one activity type, namely the stakeholder mapping game and participatory mapping activity.
- The generating phase only had meeting and presentation type of activities.

The team had no formalized activity for reflecting.

During internal meetings, the team had many conversations in which members shared doubts and concerns. However, there were no formal activities that supported reflection on the project process. The conversations that did take place were most helpful in getting on the same page and providing emotional support for team members, as the scale of the problems were often overwhelming. The first systematic reflection on the process has primarily taken place during the preparation of this paper and presentation of the case at the RSD6 conference.

Framing, formulating and generating were consecutive.

Framing, formulating and generating were consecutive in the process, meaning that the project team has gone through one iteration round (see Figure 1). However, within each of the methodological activities there were many iterations — for example, the problem was framed and reframed many times. The team however did not have a chance to return to framing after generating and gathering feedback. This can be attributed to limitations in time, speed and experience of the team members.

Inquiry and framing were the most activity intensive.

The inquiry and framing stage took up over half of the project time, and was rich in diverse methods. During inquiry, the team conducted over 20 interviews with experts, citizens, procurement law specialists and more. We travelled to Forssa three times and visited farms and food businesses. In both stages, but especially in framing, we used games and other playful and participatory activities to elicit a dialogue with stakeholders of the project. Towards the end of the process, we facilitated a participatory mapping session with a city procurer and central kitchen staff to help us understand the complex world of procurement from their point of view. Later, they shared with us that this visualizing activity was immensely helpful for them as well, as it clarified some of their understanding of the system.

The generating phase only had meeting and presentation type of activities.

The team only had three meeting-like activities for generating, that is trying ideas outside of the safety of the team, in the real world. The first generating activity consisted of a peer feedback session, which was still inside the comfort zone of peers and the course. The second instance was at a workshop-like idea presentation to the client. Here the team presented ideas that were made tangible through diagrams, with the goal of gathering feedback. The third generating activity was the final presentation, where the reframed problem and the proposed intervention was presented to an audience of about 100 people, consisting of governmental employees, students, teachers, and the public. The generating part of the process was thus quite minimal. This was partially due to the limitation of the course — the length of the course did not allow for fully explore this stage. While teams were encouraged by course

instructors to continue the projects after the course has ended, in the case of our team the ideas were not further pursued. Furthermore, it is unclear to what extent have the ideas proposed been taken up by the clients.

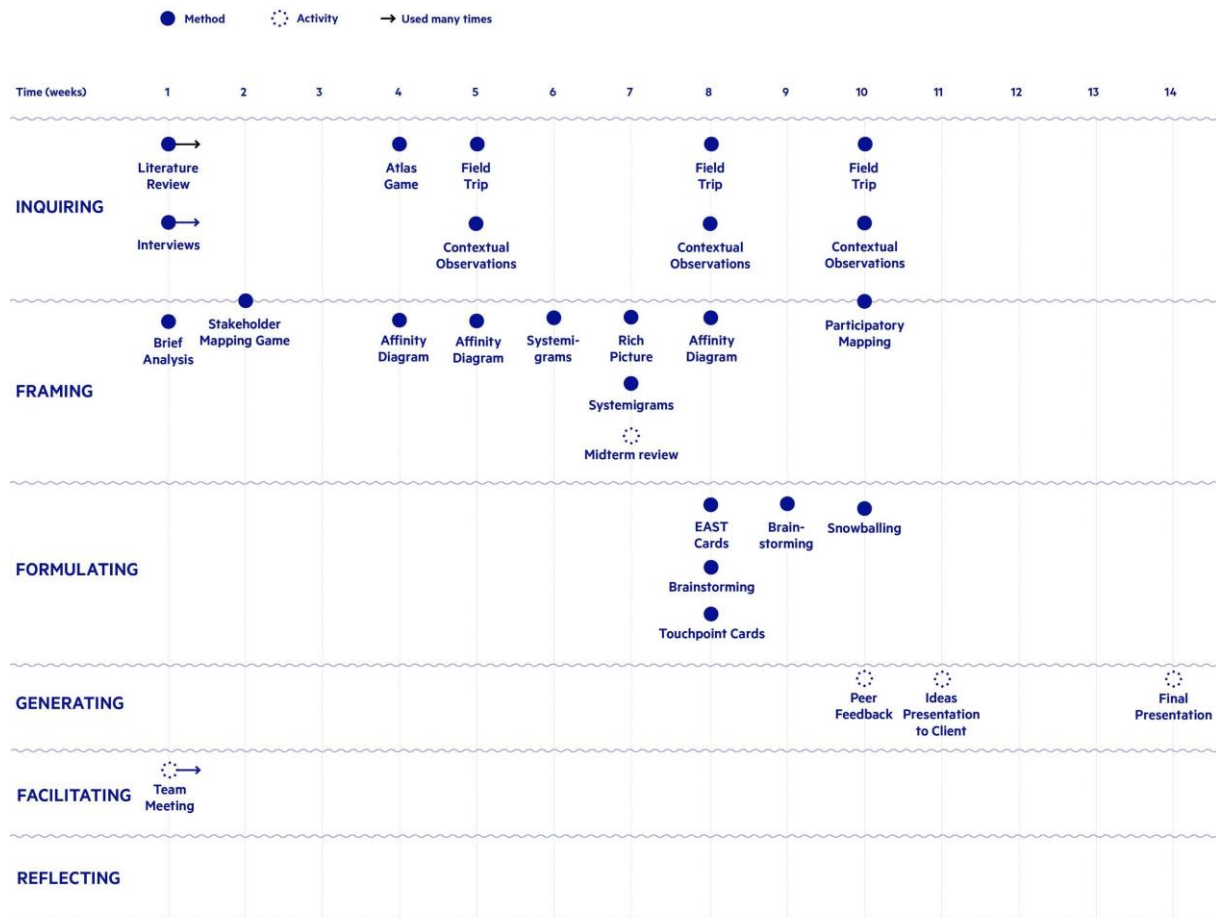


Figure 2: Formalized activities throughout the 14 week process, sorted by activity type. Note that almost all inquiring, framing and formulating activities required facilitation.

Systemic Design Framework — Methods

The Systemic Design Framework defines methods as “a set of procedures for facilitating group process that specifies how group members should work together to generate and externalise ideas” (Ryan, 2014, pg. 4). The framework categorizes methods as systemic, designerly, both systemic and designerly, or neither systemic nor designerly. To summarize Ryan’s definitions, systemic methods embraces complexity and the larger context, work on multiple scales and perspectives. Whereas designerly methods are collaborative, explorative, playful and create tangible ideas. (Ryan, 2014) Designerly *and* systemic methods combine characteristics from both.

Case study reflection on methods

Similarly to the reflection on methodology, we revisited project documentation and identified methods used in the project, and sorted each of them by method class (see Table 2). Note that not all formalized activities introduced in the methodology section constitute a method (e.g. client presentations), so those were left out of the methods reflection. Additionally, the distinction between designerly and systemic methods is not always clear cut. Some designerly methods may contain traces of systemic traits, and vice versa. In the classification below, methods that are *mostly* designerly, or *mostly* systemic are labelled as “designerly” or “systemic”, respectively. Those that contain traits from both categories were labelled “systemic and designerly.”

METHOD	DESCRIPTION	METHOD CLASS
Brief Analysis	Here we analysed the brief provided by the client by identifying thematic areas, how the problems are defined and positioned.	Not Systemic or Designerly
Literature Review	We systematically collected and reviewed literature (both academic and non-academic, reports, case studies, examples, statistics etc.) based on the themes identified in the brief.	Not Systemic or Designerly
Stakeholder Mapping Game	The team developed a game to facilitate a discussion and map issues by experts. The game featured cards denoting different actors in the food system as prompts. The participants were asked to connect the actors with different types of flows. These were depicted by arrows denoting material, information, money, etc, and share their understanding of the connections.	Systemic and Designerly
Affinity Diagram	Affinity diagramming (Lucero, 2015) was used to synthesise and make sense of the quantitative and qualitative data gathered throughout the process in a group setting. This method was used three times and helped to synthesize information into themes and questions.	Systemic and Designerly
Systemigram	Systemigrams (Monat & Gannon, 2015) were used to translate the identified issues into diagrams that described the system's principal concepts, actors, patterns and processes. They were also helpful as a tool to align and share information within the group.	Systemic and Designerly
Rich Picture	Rich picture (Checkland and Poulter, 2006) method was used from Soft Systems Methodology to see the situation through the eyes of the procurer.	Systemic and Designerly
Participatory Mapping	Participants were asked to describe the procurement process by connecting actors and activities in a sequence, while sharing their understanding of the connections.	Systemic and Designerly

Atlas Game	A modified version of the ATLAS game, originally intended for project planning (Hannula, 2014), was used to facilitate the discussion between stakeholders on issues outlined in the brief. The game consisted of themed decks of cards that posed questions to players, as well as a deck of cards depicting critical stakeholders was used to prompt discussion.	Designerly
Interviews	Semi-structured interviews were conducted either in person or over the phone. Some interviews were complemented by exercises such as sketchnoting (Erb, 2012) performed by a team member.	Designerly
Contextual Observations	During the field trips, we conducted on-site observations.	Designerly
Field Trips	The team traveled multiple times to the city of Forssa to conduct on-site interviews, observations and to tour relevant locales.	Designerly
EAST Cards	Behavioural Economics asserts that we can encourage certain behaviors by making them "Easy, Attractive, Social and Timely". (Service et al., 2014, p.4). The EAST cards, based on this principle, supported the team's brainstorming sessions by helping us imagine how interventions could be made within existing routines to encourage desired behaviour.	Designerly
Brainstorming	The team generated as many ideas as possible by using different opportunity questions as triggers.	Designerly
Snowballing	The snowballing technique helped us iterate and improve on the ideas by taking turns critiquing and building on them.	Designerly
Touchpoint Cards	The cards helped ideating interventions around specific touchpoints in service interactions.	Designerly

Table 2: Methods used during the project, accompanied by a short description and classification.

Most of the tools used in the process were designerly, and there were no systemic-only methods used (see Figure 3). Two methods were used that can be classified as neither systemic nor designerly.



Figure 3: Tally of the type of methods used, sorted by category.

It was also interesting to sort the methods based on the methodological activities. In Figure 4, we can see that during inquiring and formulating, mostly designerly tools were used, whereas in the framing stage mostly systemic and designerly methods were used. Formal methods were not used in the other stages of the process.

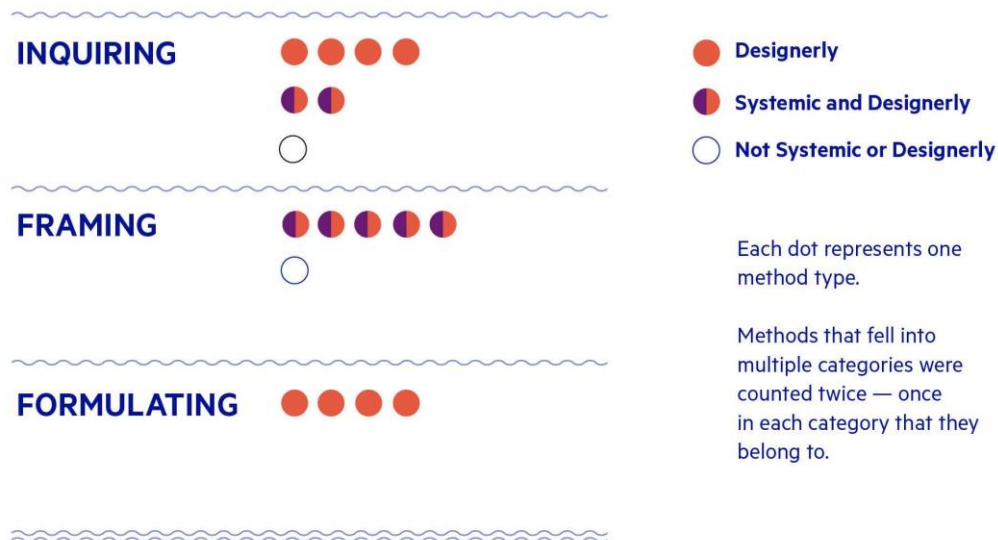


Figure 4: Method type sorted into activity type

This shows that methods that blended systemic and designerly approaches were most useful in the framing stage of our project. Indeed, framing is critical, where the team makes sense of the information gathered, uncovers dominant frames and chooses new ones. The designerly aspect helped by making this a more collaborative and visual process. To reflect further, the type of methods utilized throughout the project were heavily influenced by the ones formally taught and introduced during lectures. However, the methods were not prescribed — the team was encouraged to make decisions freely about which methods to use and when.



Pictures of the team working together, and presenting the final proposal.

Looking back on the process, it would have been beneficial to have more formal reflection and evaluation that could have supported constructive team reflections. After all, reflection is a very important part of systemic design according to Ryan (2014). Additionally, doing shorter iterative rounds of framing, formulating and generating, instead of one long round could have also benefited the project outcome. Because of the magnitude and complexity of the problems presented in the brief, the team felt that we did not know enough to move from framing to formulating and generating earlier. Of course, it is never possible to know everything about a problem. In retrospect, remaining aware of assumptions and the gaps in the knowledge was more important than attempting to know everything. Moving a bit braver through the process would have driven learning through feedback and could have improved the quality of the final proposal.

This study detailed the experience of one team out of the four that participated in the DfG class of 2017. While the findings are not generalizable to the whole course, nor the process of the other teams, the other teams did receive similar instructions, attended the same lectures and were exposed to the same methods. An area for further study could be the assessment of the other teams' processes using the Systemic Design Framework, as well as to examine the mindset of the students, which was outside of the scope of this particular study. Additionally, a more comprehensive assessment on the impact could benefit the development of the course, as well as other institutions looking to impart systemic design ways of working to their students. Another area for further investigation might be to take a closer look at how the systemic block of the DfG course relate to and differ from the systemic design described in Ryan's (2014) framework.

Conclusion

This paper reflected on the context and process of our project developed under the Design for Government course at Aalto University. Through the examination of the process, we identified that the reflecting and generating part of our process would have benefited from more formalized methods and activities. Inquiry and framing were very well supported and employed a wide array of methods. The overall impact of the final proposal is not clear, but the team has learned a tremendous amount about working with complex problems. The inspection of the methodology and methods seem to suggest that the team did indeed engage in systemic design, however inspection of the mindset is needed to complete the study. As far as we evaluate this project based on the extent to which students acquired experience and knowledge on systemic design way of working, the project can be considered a success.

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