Exploring Systemic Design: Practical Insights for Organizational Implementation

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Laurea University of Applied Sciences **Abstract**

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Many contemporary challenges, such as environmental issues, healthcare, and digital transformation, are so complex that traditional approaches fail to address them. Navigating and thriving within such complexities is crucial for organizations, yet doing so presents significant challenges. One approach gaining traction in addressing systemic issues is systemic design. This thesis, commissioned by Kela, the Social Insurance Institution of Finland, aimed to explore systemic design as a field and provide insights into its implementation within organizations.

The study examined the theoretical foundations of systems, complex problems, and systems thinking, providing insights into complex systems. It also explored the relationship between design and complexity and systemic design. Furthermore, it investigated innovation and organizational transformation. Using a qualitative research approach with an abductive reasoning method, data were collected through eleven semi-structured interviews with individuals from various organizations in Finland and internationally. Interviewees ranged from those who were only starting to familiarize themselves with systemic design to those with extensive experience in complex global settings.

The study identified six different perspectives on systemic design, revealing significant differences among them. These perspectives also require varying levels of organizational maturity to be effectively implemented. Instead of prescribing a specific methodology, the study suggested an approach based on principles and crucial elements: methodology, learning, collaboration, and organization. Furthermore, the research findings indicated that the organization plays a key role, with many challenges associated with systemic design being linked to organizational limitations.

The path to systemic design within organizations was created, comprising four key elements: systemic design perspectives, a systemic design framework, a systemic design maturity model, and a matrix of organizational maturity and systemic design perspectives. These components offer practical guidance for organizations seeking to adopt systemic design approaches.

As a tangible outcome of this research, a practical booklet on systemic design was developed. This resource is designed to assist designers and others in integrating systemic design into their work and initiating organizational-wide adoption.

Keywords: systemic design, systems, complexity, organizational transformation

Contents

1 Introduction

"We can't control systems or figure them out. But we can dance with them!"

Donella Meadows

The world is experiencing massive changes, and it has become increasingly complex, uncertain, and interconnected. Climate change, environmental degradation, health inequalities, food insecurity, and digital transformation are just a few examples of persistent social and ecological problems the world currently faces. They are complex as they are inherently dynamic, ambiguous and highly interconnected as well as difficult, if not impossible, to define and solve – "*problems that are so open, complex, dynamic, and networked that they seem impervious to solution*" (Dorst, 2015a p. 1).

Amidst these challenges, organizations are expected to know how to navigate and thrive. They are learning that current issues cannot be resolved like we have approached problems in the past. In complex and uncertain contexts, conventional analytical tools and problem-solving methods no longer work (OECD, 2017). There seems to be a prevalent belief that innovation, design, and systems thinking are crucial approaches for addressing many of these challenges. Nevertheless, while there is an acknowledgment of the importance of systems thinking in dealing with the complexities of the contemporary world (Arnold and Wade, 2015), it is often criticized for becoming entrenched in analysis (Conway et al., 2017). On the other hand, the design might limit itself when approaching complex issues through a problem-solving perspective (Dorst, 2019). Furthermore, there is a misleading narrative about how innovation, particularly novel technological single solutions, will solve the challenges we currently face. However, linear cause-and-effect relationships do not adequately address the complexities of interconnected systems and emergent behaviors.

We have struggled to address such complex and systemic problems, and overcoming this requires a fundamental shift in our thinking and approach to such issues affecting individuals as well as organizations (Costa Junior et al. 2019). Therefore, there has been an increasing interest in more systemic approaches, and systemic design is one of them. Systemic design is a relatively new and rapidly evolving field. As with any systems approach in general, it is sometimes regarded as complex, theoretical, and sometimes challenging to comprehend, and for organizations, initiating the process of integrating systemic approaches into their operations can be daunting. This thesis aims to provide an overview of the field of systemic design and provide valuable insights into its implementation within organizations.

1.1 Commissioning Organization

This study was commissioned by and conducted in collaboration with the innovation and growth unit of Kela, the Social Insurance Institution of Finland. Kela is a government agency that provides basic economic security for everyone living in Finland. It is an independent social security institution with its own administration and finances, supervised by the Finnish Parliament (Kela, 2023).

Kela was founded in 1937 with a responsibility to pay out national pensions. However, since then its operations have been expanded, diversified and modernized and currently the largest categories of benefit expenditure are national pensions, unemployment benefits, reimbursements for prescription drug costs, general housing allowances, child benefits and sickness allowances (Kela, 2023). In 2022, Kela's total benefit expenditure amounted to approximately EUR 16 billion. It has 130 customer service locations and 157 other service points throughout the country, and it employs more than 8,000 people (Kela, 2023).

Kela founded an innovation and growth unit, "KelaLab", in 2019. It was born amid a major organizational change, during which the entire development model of Kela was renewed. A key question was how to integrate innovation activities into this revamped model and the organization's shared development process (Pulkkinen, 2019). The purpose of the innovation and growth unit is to accelerate Kela's technological development and adaptability to change. It takes charge of experimenting with emerging technologies within the organization and strives to develop seamless public services for Kela's customers. Within the organization, it fosters an innovation culture through design thinking.

Working with systemic issues is not new to Kela as by default issues related to social security are often complex involving multiple actors, separate budgets, goals, and metrics. Kela's approach to systemic issues has been phenomenon-based thinking and working. Phenomenon-based thinking is a way to approach societal challenges that the public sector aims to address systematically (Sitra, 2018). For example, in 2022, Kela conducted a model experiment where Kela's foresight and innovation activities were integrated and one phenomenon, youth mental health problems, was more closely examined and information created into a strategy.

Kela has a keen interest in delving deeper into addressing systemic issues, improving its approach, and enhancing its capabilities in this regard. While it has conducted some experiments, it acknowledges the lack of an efficient systemic approach. Additionally, there is a clear gap identified in information and knowledge on the topic. The organization is actively progressing toward more systemic approaches by, for instance, recruiting new designers with expertise in ecosystem work. This thesis serves as a partial contribution to their ongoing efforts aimed at building knowledge and experience in this particular domain.

This thesis is not a case study focused on Kela; however, it has been undertaken at the request of Kela and is intended to serve their needs. Data collection primarily relied on external sources, drawing from individuals with extensive experience and recognition in this emerging field.

In this report, Kela, more specifically their innovation and growth unit, is referred to as a commissioning organization.

1.2 Aim and Purpose of the Thesis

The aim of this thesis is to explore systemic design as a field and provide valuable insights into its implementation within organizations. Two research questions that guided the study were as follows:

RQ1: How do different actors across multiple organizations perceive systemic design?

RQ2: What approaches can organizations adopt to integrate systemic design practices into their operations?

The development purpose of this thesis is to provide a practical understanding of systemic design and develop a path for its implementation in an organization. It is aimed to be tangible enough to benefit the commissioning organization in their systemic work efforts and thus develop a workplace.

1.3 Structure of the Thesis

The structure of this thesis comprises the following seven chapters.

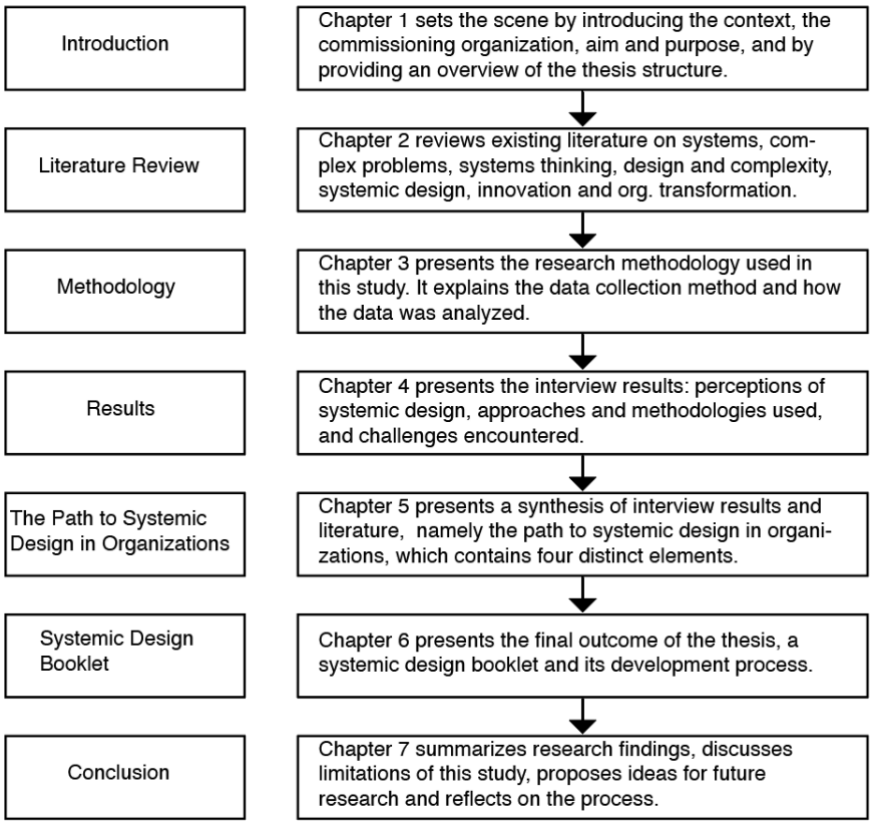

Figure 1: Thesis structure

In the first chapter, the topic is introduced, along with the commissioning organization and the reasons for this study, and it also outlines the research aim and objectives, and key concepts. Following this, the second chapter, the literature review, explores the following concepts: systems, complex problems, systems thinking, design and complexity, systemic design, innovation, and organizational transformation. Chapter three describes the methodology employed in the study and the results of the study are presented in chapter four.

Chapter five synthesizes interview results with the literature review, offering a pathway toward systemic design in organizations. Moving forward, chapter six presents the final outcome of the thesis, a systemic design booklet, and outlines its development process.

Finally, in the seventh chapter, conclusions are drawn, study limitations are addressed, and potential avenues for future research are suggested. Additionally, the author reflects on the process in the final chapter.

1.4 Key Concepts

This chapter presents some key concepts and terms of the thesis. The list of concepts is not exhaustive, but a more thorough understanding is built in Chapter 2, covering existing literature on the topic.

Design thinking: The origins of design thinking date back to the 1960s (Elsbach and Stigliani, 2018), but it wasn't until the 1990s that it gained widespread popularity and entered the mainstream, largely due to the design firm IDEO. Design thinking is a human-centered approach to problem-solving; it is both a mindset and a set of design-based activities. It fosters collaboration and includes a deep understanding of the customer's needs, rapid prototyping, and the generation of innovative and imaginative ideas (IDEO, no date).

System: The term system is used very widely to cover various things in which changes in one part affect the other parts and the whole. A system can be said to be an interconnected set of elements that work together in an organized manner, forming relationships among parts to achieve a common purpose or goal (Meadows, 2008; Buchanan, 2019).

Systems thinking: Systems thinking is an approach that acknowledges how different parts of a larger system are interconnected rather than separate entities. Systems thinking aims to comprehend the complexities and reveal the interconnected nature of a given system. "*Systems thinking is the art and science of making reliable inferences about behavior by developing an increasingly deep understanding of underlying structure*." (Richmond, 1994 p. 6).

Systemic design: Often systemic design is defined as a combination of systems thinking and design thinking and/or systems practice and design practice (e.g. Sevaldson and Jones, 2019; Jones and Van Ael, 2022; van der Bijl-Brouwer, 2023). Systemic design is intended for complex situations and it often tackles large-scale issues and social complexity. Sometimes systemic design is also called, for example, systems (oriented) design, systems-led design, systems-aware co-design, design for complexity, or systems or systemic innovation (Blomkamp, 2022).

Systems design: Sometimes systemic design is also called systems design, but by definition, they are not the same. Systems design is a practice developed through systems engineering, the design of systems as objects where the aim is to produce system properties (Jones, 2022). Unlike in systemic design, designers have full authority over the parts of the system.

System(s) innovation: Systems innovation can be said to be an approach to change that involves the combination of systems thinking and innovation (Si Network, no date). This can mean, for example, "*an interconnected set of innovations, where each influences the other,*

with innovation both in the parts of the system and in the ways in which they interconnect" (Nesta, 2013).

Innovation portfolios: Innovation portfolios are an approach to systems transformation. The core of this approach is to have close interaction between connected projects or experiments fostering collaboration and mutual learning – a shared impact arises from actions driven by that shared understanding (Seppälä, 2021). It is also "*a methodology that seeks to develop, test, learn and scale (where appropriate) a suite of interventions that are complementary and can shift complex systems by focusing on multiple intervention points at a given time"* (UNDP, 2022 p. 3).

2 Literature Review

This chapter reviews the applicable literature on key topics important for understanding systemic design within organizational contexts. It begins by examining systems, complex problems, and systems thinking to provide insights into complex systems and some ways to approach them. Then it explores design and complexity along with systemic design to provide insights into design's relation to complexity and systems. Finally, the last chapter briefly touches on innovation and organizational transformation.

2.1 Systems

The concept of a system has been explored in various fields, giving rise to systems theories in disciplines such as biology, ecology, engineering, and computer science. Traditional system approaches, such as systems engineering are built upon the premise that the world comprises observable systems that interact with each other (Lurås, 2016). This perspective often refers to as a 'hard system'. The underlying assumption of the 'hard system' is that when faced with a problematic situation, the most effective approach is to optimize the system's performance in order to achieve well-defined objectives and goals (Checkland, 1978). It assumes that the world can be controlled and engineered and, thus is effective mostly in solving well-defined problems. However, real-world problems that come with explicitly defined goals and objectives are quite limited. Hence, systems thinkers responded with an alternative perspective, a 'soft system' that recognizes that many real-world problems are complex, subjective, and involve multiple perspectives (Jackson, 2001). This includes approaches such as soft systems methodology (SSM) (Checkland, 1999) and organizational cybernetics (Beer, 1972).

The term 'system' has many definitions, and comprehending what a system entails is an ontological question. In essence, it pertains to understanding how we perceive and conceptualize reality (Lurås, 2016). An influential systems thinker Donella Meadows defines a

system as follows: "*A system is an interconnected set of elements that is coherently organized in a way that achieves something*." (Meadows, 2008 p. 11). According to this definition, a system must consist of three kinds of things: elements, interconnections, and a purpose. A design scholar Richard Buchanan is in the same line with the definition of a system *"A system is a relationship of parts that work together in an organized manner to accomplish a common purpose."* (Buchanan, 2019 p. 86).

According to Meadows (2019), the elements of a system are often the easiest parts to notice, because many of them are tangible things. However, it doesn't make them the most important part of a system. It is usually more interesting to explore the interconnections of the system. Many other system thinkers and scholars also emphasize how a system is more than the sum of its parts. For example, Ryan (2014, p. 2) emphasizes the interdependent nature of the system by stating "*A key concept of systemics is interdependence: webs of reciprocal influence between parts of a greater whole and their environment"*. He argues that interdependencies between system elements and their environment could bring about, for example, emergence, self-organization, learning, adaptation, evolution, law statistics, chaos, and complexity. Acknowledging the relationships between elements is as important as acknowledging the elements themselves as "*these relationships lead to emergent properties and behaviour that could not take place without the elements interacting*" (Drew et al., 2021 p. 23).

Systems can change and adapt, and they are often self-organizing. They are resilient and many systems evolve over time (Meadows, 2008). Moreover, it is not easy to see the boundaries of the system as systems are often interconnected and embedded within larger systems, forming a complex web of relationships. Werner Ulrich argues in his boundary critique idea that system boundaries are not given but constructed. He proposes that these boundaries "*always depend on boundary judgments as to what 'facts' (observations) and 'norms' (valuation standards) are to be considered relevant and what others are to be left out or considered less important*" (Ulrich, 2005, np). Systems are complex, dynamic, and unpredictable and they can't be controlled.

2.2 Complex Problems

"*Complexity is often linked to things that are difficult to understand, or too complicated to grasp quickly. In other instances it is treated as a matter of scale or duration*" (Nelson, 2007 p. 100). Scientifically complexity is more than that. The science of complexity has been studied in different fields, for example, mathematics, natural and social sciences and "*it has become the focus of inquiry in the systems science domains of complexity theory and chaos theory*" (Nelson, 2007 p. 101). However, many of the studies aim at explaining complex

natural phenomena, and less is put emphasis on the societal kind of complexity (Gershenson and Heylighen, 2005).

In today's fast-changing and interconnected world, complexity has become a pervasive characteristic of our reality. Some call the situation the VUCA world (the acronym stands for volatility, uncertainty, complexity, and ambiguity). In this framework, volatility refers to frequent and sometimes unpredictable changes, while uncertainty denotes a lack of knowledge. Complexity refers to a situation characterized by many interconnected parts, and ambiguity to a situation in which cause and effect are not understood and there is no precedent for making predictions as to what to expect (Bennett and Lemoine, 2014).

The Cynefin framework (Snowden and Boone, 2007) is a sensemaking framework to make sense of the environment and understand which context they/the problem are in. The framework has four different domains in which a problem might fall: simple, complicated, complex, and chaotic. The complicated one is described as the realm of ‘known unknowns’, you know what you don’t know, whilst the complex domain is described as the realm of ‘unknown unknowns’, you don’t even know what you don’t know. So, even if the complex and complicated might seem like the same thing, there is a fundamental difference between them and consequently, how you should approach the situation/problem (Snowden and Boone, 2007). The framework can be useful to help build awareness of what is really complex and what is not and respond accordingly. See Figure 2 for a visual representation of the Cynefin framework.

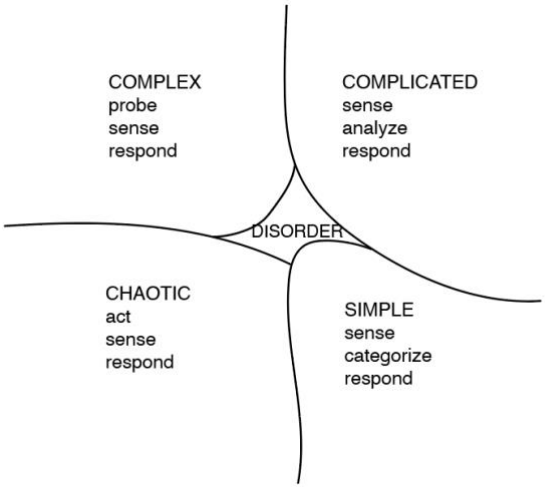

Figure 2: Cynefin framework (adapted from Snowden and Boone, 2007)

By leveraging the Cynefin framework, individuals and organizations can better navigate the complexities of the VUCA world. It provides a structured approach to sensemaking, decision-

making, and problem-solving, promoting a more nuanced understanding of complex systems and their dynamics.

Complex problems refer to challenging issues that arise in situations characterized by complexity, uncertainty, and turbulence (Harwood, 2023). These problems can emerge within complex systems or be influenced by them. Meadows (2008) provides examples such as hunger, poverty and environmental degradation as problems that have been tried to be solved/eradicate, but despite the efforts they still persist. It's because they are intrinsically systemic problems, "*undesirable behaviours characteristic of the system structure that produce them*" (Meadows, 2008 p. 4).

DeTombe (2015) discusses complex societal problems that are hard to define, and even the desired situation is not always clear and is usually difficult to find. They are real-life problems that have a large impact on society, institutions, and organizations, and on phenomena and actors. There are different actors involved and problems are dynamic problems embedded in a dynamic environment.

Another, perhaps more known term for complex systemic problems is wicked problems. Wicked problems are complex, ambiguous, and highly interconnected issues that are difficult, if not impossible, to define and solve. The term originates from Rittel and Webber (1973) who divided problems into two types of problems, each requiring different methods of systems analysis: 'tame' and 'wicked' problems. Tame problems are characterized by having a clear and linear path toward a solution. These problems can be defined and dealt with in structured decision-making, and it is clear whether or not the problem has been solved. In contrast, wicked problems are hard to define, and the nature of the problems remains ambiguous and elusive. According to Jones (2014), it's even incorrect to speak of solving wicked problems, as there are no agreed evaluation measures justifying the claim. "*Above all, wicked problems won't keep still: they are sets of complex, interacting issues evolving in a dynamic social context. Often, new forms of wicked problems emerge as a result of trying to understand and treat one of them.*" (Ritchey, 2013 p. 2)

There is no shortage of complex systemic problems. Climate change, income inequality, political polarization, and healthcare access are just a few examples. These problems are intertwined and influenced by various factors making it impossible to address them with simple solutions. Instead of focusing on possible solutions, one can explore ways to intervene in the system to change the structure of systems. This will result in more desired outcomes while minimizing the occurrence of undesirable ones. In systems analysis, the way to do that is through leverage points, "*places in the system where a small change could lead to a large shift in behaviour*" (Meadows, 2008 p. 145). However, Meadows (2008) emphasizes that leverage points are no magic bullets, there are no quick or easy formulas to identify leverage

points in complex and dynamic systems and they are often counterintuitive, meaning that we might systemically worsen the problem we are trying to solve.

2.3 Systems Thinking

Systems thinking originates from systems science and as in various other disciplines, there is no singular definition of what systems thinking entails. According to Berry Richmond who is credited with coining the term (Arnold and Wade, 2015) systems thinking can be described as follows: "*Systems thinking is the art and science of making reliable inferences about behavior by developing an increasingly deep understanding of underlying structure*." (Richmond, 1994 p. 6). Systems thinking can be viewed as an approach to problem-solving that recognizes the interconnected nature of the components within larger systems, rather than seeing them as independent entities (as also described by Meadows). Therefore, systems thinking aims to comprehend the complexities and reveal the interconnected nature of a given system.

Systems thinking is not new and, in general, there is a consensus regarding its importance in dealing with the complexities of the contemporary world (Arnold and Wade, 2015). Nevertheless, it is not exempt from criticism. A common critique of systems thinking is that while it tries to understand complexity, it gets stuck in analysis (Conway et al., 2017) and modeling systems (van der Bijl-Brouwer and Malcolm, 2020). Buchanan (2019) argues that systems thinking regards systems as an abstract model of constituent parts, thereby reducing their inherent complexity – this reductionist abstraction is not sufficient in dealing with systemic issues. Additionally, Buchanan argues that systems thinking occasionally overlooks the concrete experiences of individuals who live and function within their unique environments. Additionally, Dan Hill criticizes systems thinking as having an illusion of control "*that you can model these things, or tweak a few levers, the water will flow through the model in the opposite direction and all the risks become opportunities"* (Drew et al., 2021 p. 25). Instead, he suggests "*Systems are to be engaged with on the ground, which means systems doing, not systems thinking"* (Drew et al., 2021 p. 25).

2.4 Design and Complexity

The concept of a system is not new to design theory and practice. Every design product, be it a poster, physical artifact, or service, functions as a system of interconnected parts with a common purpose (Buchanan, 2019). Designers recognize that products exist within broader systems and environments, highlighting the interconnected nature of design challenges in our dynamic world (Buchanan, 2019). Systems thinkers such as Russell Ackoff and Bela H. Banathy discussed already decades ago the purposeful design of human social systems (Metcalf, 2014). However, renewed attention has recently been directed toward the topic (Buchanan, 2019), and there's a growing call for designers to deal with more systemic issues (Norman and

Stappers, 2016). The public sector, in particular, faces increasing demands to manage these challenges. However, existing practices often prove insufficient to tackle such problems (Kaur, 2019). For example, according to Dorst (2015a, p. 2), *"--'design thinking'" mostly focuses on the designer's abilities in generating solutions, rather than on the key ability of expert designers to create new approaches to problem situations ("framing")* which Dorst sees as a key in addressing complex problems. Generally, the prevailing approaches often involve deconstructing complexity into separate elements, subjecting each part to individual analysis to understand the overarching system. Especially public and social institutions have favored these kinds of reductionist and determinist approaches to break a situation into parts, resolve each part, and then synthesize solutions together (van der Bijl-Brouwer, 2019). However, breaking down a complex system using an analytical method disrupts the connections between its components, making it difficult to understand and describe the system's overall behavior (Costa Junior et al. 2019). As discussed earlier, reductionist approaches to problem-solving simply don't work in systemic issues.

Design has the potential to deal with complex issues. It possesses highly developed methods for asking open-ended questions and framing opportunities and moving forward in unknown territory (Drew et al. 2021). In addition, designers are generally good at dealing with fuzzy problems. According to Nelson (2007), there is both a desire and fear for complexity, but with complexity also comes a fear of chaos and lack of control. In his view, complexity can be simplified without being simplistic. Design, as a strategic intent, has the ability to alleviate the anxiety associated with the possibility of chaos by providing an approach that embraces complexity. "*Design does not confuse chaos as complexity*" (Nelson, 2007 p. 103).

However, it is not always clear how design should approach these systemic and complex, often societal issues as traditional design approaches are finding limitations in dealing with the complexities we face today. According to Dorst (2019), the design might limit itself when approaching complex issues through a problem-solving perspective. Linear cause-and-effect relationships do not adequately address the complexities of interconnected systems and emergent behaviors. "*In a truly complex situation, there IS no solution—the way to achieve progress is to create high-quality interventions to bring the whole system forward into a more desired state*." (Dorst, 2019 p. 123). While design thinking has proven successful in creating new products and services, Conway et al. (2017) argue that it alone is insufficient to tackle our most complex challenges. Similarly, the user-centered design approach, while valuable in many contexts, falls short of adequately addressing the scale and complexity of the challenges prevailing in today's world (Sanders and Stappers, 2008). According to Dorst (2019), in really complex systems, novelty arises from the emergence of order, as opposed to purposeful generation. In order to achieve change, one must influence the system rather than implement a plan to solve a problem.

The Design Domain model of Design 1.0 – 4.0 (Jones and Van Patter, 2013 cited in Jones and Van Ael, 2022) reveals how the boundaries of design, in terms of social complexity, have broadened. In the model, design can be classified into different domains, each with its distinct focus and skill requirements. D1.0 (artefactual) and D2.0 (products and services) are well-established domains of skilled design practice aimed at improving human experiences. These domains prioritize design quality, aesthetics, and usability to enhance economic value and competitiveness. Moving beyond the traditional domains, we encounter D3.0 and D4.0, which involve organizational processes and social systems, respectively. These domains represent more intricate and complex territories of design, demanding entirely different skill sets. Designers engaged in transdisciplinary projects and mixed-stakeholder teams play a crucial role in tackling the complexities of D3.0 and D4.0, where the focus shifts towards managing complex organizational dynamics and societal interactions. (Jones and Van Ael, 2022). See Figure 3 for an illustration of the four design domains.

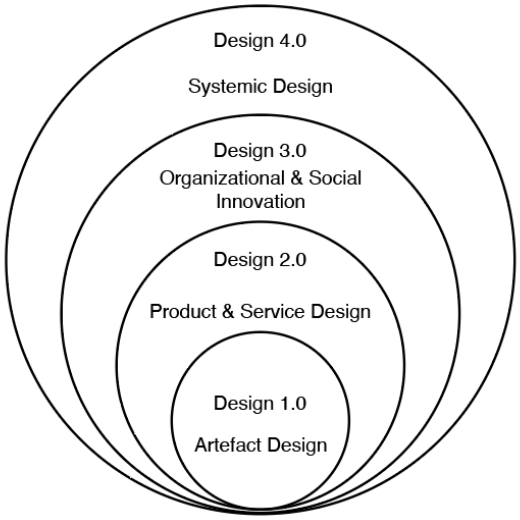

Figure 3: Boundaries of the four design domains (adapted from Jones and Van Ael, 2022)

Major differences in the scale of the problem and complexities are found between each level. D1.0 and D2.0, product-oriented domains, experience either a low level of complexity or the complexity is limited to artifacts whilst D3.0 and D4.0 can both be characterized as complex. The key difference between D3.0 and D4.0 in terms of complexity is that in D3.0 the complexity is bounded by business or strategy whilst in D4.0 it is not. In D3.0 the design processes embodied in the domain are, for example, strategies and organizational structures whilst in D4.0 they are social transformation, complex social systems, policy-making, or ecological design (Jones and Van Ael, 2022).

Van Patter (2020) has visualized the difference between small-scale vs. large-scale challenges by using the four design domains. As seen in Figure 4, the large-scale challenges, wicked problems, are in the D3.0 and D4.0.

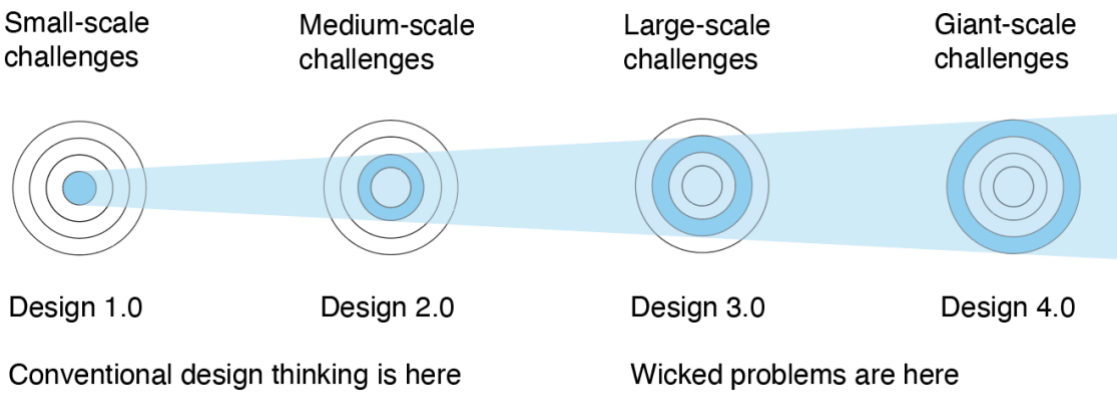

Figure 4: From small-scale to large-scale challenges (adapted from Van Patter, 2013)

2.5 Systemic Design

Systemic design is a broad and emerging space with several definitions and even without sufficient agreement regarding the name (Jones, 2014). Systemic design can also be called, for example, systems (oriented) design, systems-led design, systems-aware co-design, design for complexity, or systems or systemic innovation (Blomkamp, 2022). However, often systemic design is defined as a combination of systems thinking and design thinking and/or systems practice and design practice. For example, Sevaldson and Jones (2019) define it as a design practice with systemic thinking and according to Kaur (2021), systemic design integrates systems thinking into design. Jones and Van Ael (2022) discuss an interdisciplinary field integrating systems thinking and systems methods to human-centered design. Systems thinking and design thinking complement each other by offering distinct perspectives and methodologies to approach complex problems. The former enables designers to consider interconnected relationships and view problems holistically, while the latter fosters a user-centric and creative approach to generating solutions. Given that systems thinking involves an analytical approach, and design thinking is action-oriented and filled with creativity, the two methodologies mutually complement each other. As Buchanan (2019, p. 100) wrote, "*Systems thinking begins with a concept of systems and ends with the need for design action. Design thinking begins with creative inquiry in action and ends with the creation of systems of diverse scales, ranging from communications and artifacts to activities and organizations.*"

Systemic design is "*intended for situations characterized by complexity, uniqueness, value conflict and ambiguity over objectives*" (Ryan, 2014 p. 12). It stands apart from other design approaches due to its focus on larger-scale issues, social complexity, and integration.

Systemic design revolves around higher-order systems that encompass multiple subsystems (Jones, 2014).

Systemic design should not be confused with systems design even though terms are often used interchangeably (van der Bijl-Brouwer, 2023). Systems design is the design of systems as objects where the intention is to produce system properties (Jones, 2022). In systems design designers possess full authority over the parts of the system as well as the interrelationships between them, thereby enabling them to define the boundaries of the system in an objective manner (van der Bijl-Brouwer, 2023). It's developed through systems engineering and it's part of the 'hard system' approach which was discussed in Chapter 2.1.

In systemic design, systems *"have boundaries that cannot be objectively defined and have properties that cannot be fully predicted*" (van der Bijl-Brouwer, 2023 np). Systemic design promotes a holistic perspective, encouraging a systemic lens to comprehensively understand complex problems. It involves analyzing the interdependencies and feedback loops among various components and moving beyond isolated solutions to address the root causes of complex issues and interdependencies. Essentially, it encourages a perspective that goes beyond immediate symptoms and fully embraces the complexity of the systems it seeks to influence.

Rempt (2023) discusses systemic design through the types of value in their thesis. The value of a service comes from user-service interaction and cannot be designed directly as it emerges from multiple interactions. Rempt (2023) continues, referring to both Vargo and Lusch (2017) and Jones and Van Ael (2021), that taking a systemic perspective means examining multiple simultaneous relationships and interdependencies. Services and products coexist within a larger system, offering value to users, customers, and other participants. However, at the system level, it is important to consider not only the individual service interactions, but also how they interact with other services, actors, and relationships within the broader context. The broader value of the organizational ecosystem emerges from these interactions and relationships. See Table 1 for a summary of these different types of values.

Table 1: Types of value (Rempt, 2023)

	Product value	**Service value**	**Systemic value**
Property of value	Embedded	Emergent	Emergent
Materials of design	Physical properties	Touchpoints	Relationships

	Product value	**Service value**	**Systemic value**
Manipulability	Controllable	Indirectly controllable	Not directly controllable

Systemic design is not a strictly defined field with standard practices, but there are several approaches or versions within the field of systemic design that vary in terms of their intention and practices. For example, a well-known version of systemic design is Systems-Oriented Design (SOD) developed by Birger Sevaldson. It's a skill-based approach that focuses heavily on visualization and it's known for a holistic mapping tool, a technique called gigamapping. According to Sevaldson (2017, p. 2), "*SOD is the most designerly and practice-oriented version of systemic design*". Another approach that has many similarities to systemic design approaches is Transition Design which focuses on tackling wicked problems. It takes a systemic approach and emphasizes sustainability, complexity, multiple stakeholders, and futures thinking. Irwin (2019) describes three main elements the approach needs to have, basically describing the elements of the Transition Design. One, it must enable people, both practitioners and researchers, to distinguish between the consequences and root causes of wicked problems. Two, the approach must identify and address stakeholder concerns and conflictual relations. And three, the approach "*must frame wicked problems within the extremely large socio-technical systems within which they evolved*" (Irwin, 2019 p. 150).

Drew et al. (2021) distinguish two types of systemic design: system-conscious design and system-shifting design. System-conscious design means designing with an awareness of the wider system in which you are part and aiming at improving the existing system, while system-shifting design means designing with a specific objective of changing the system (Drew et al. 2021). These are two radically different types of design in terms of intention. Drew et al. (2021) argue that system-conscious design is becoming increasingly mainstream while system-shifting design is considered a new and emerging field. "*We need a new practice that transcends rather than merges design and systems thinking and moves us beyond hubristic or rationalist approaches to systems, a mindset of thinking, not doing, and of practices that fix the current rather than create an alternative*" (Drew et al, 2022 p. 4). See Figures 5 and 6 for visual interpretations (adapted from van der Bijl-Brouwer, 2023) of these two types of designs and their differences.

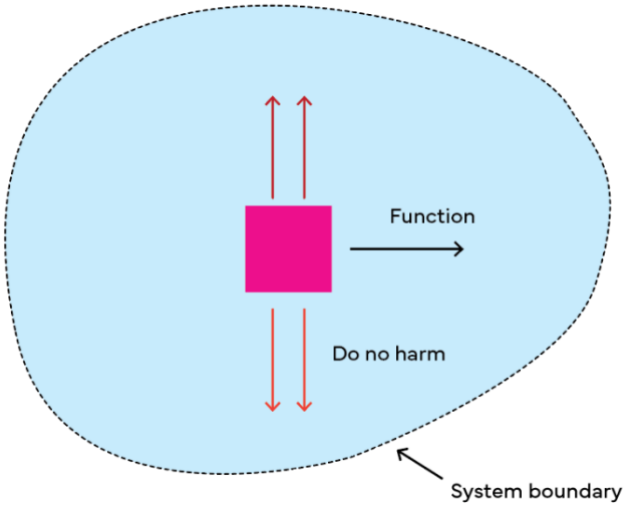

Figure 5: System-conscious design (adapted from van der Bijl-Brouwer, 2023)

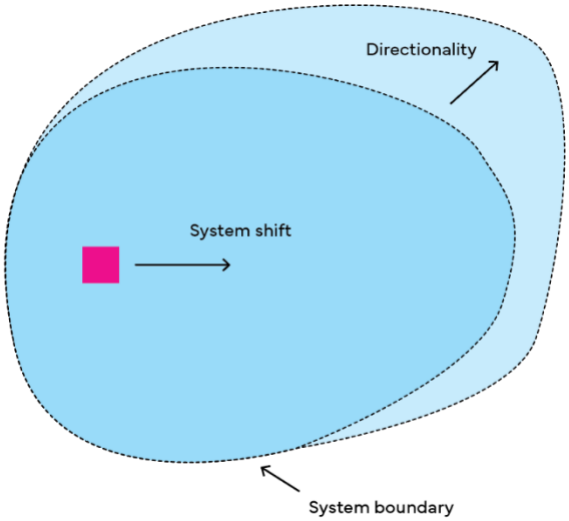

Figure 6: System-shifting design (adapted from van der Bijl-Brouwer, 2023)

Systemic Design Principles and Methodologies

Literature on systemic design provides a set of guiding principles and a broad range of methodologies to inform and guide designers and others in systemic work. Principles in systemic design are fundamental concepts or overarching guidelines that shape the mindset and actions of designers. They provide a framework for understanding and addressing complex challenges in a holistic and interconnected manner and may provide the foundation for new methods, tools, and techniques to be developed (van der Bijl-Brouwer and Malcolm, 2020). Examples of systemic design principles include collaborative (Ryan, 2014), multi-level and multi-perspective, and pluriversative (Jones and Van Ael, 2022).

Methodologies in systemic design are structured approaches and systematic procedures used to implement the design process. Methodologies are varied and each school or area of practice establishes its own unique design methodology (Ryan, 2014). According to Ryan (2014, p.8), "*methodology guides the application of a coherent sequence of methods from project initiation through to completion*". They provide a step-by-step framework for executing specific activities and tasks during the design journey, they emphasize the 'how' of design. Examples of (a step/stage/element of) methodologies include framing (Ryan, 2014; Jones and Van Ael, 2022) and reflecting (Ryan, 2014).

Many experts and scholars emphasize the importance of principles over specific methodologies or methods in systemic design. Systemic design is an emerging field and experts have suggested not settling into a fixed methodology (Sevaldson and Jones, 2019), but rather using an approach based on principles (van der Bijl-Brouwer and Malcolm, 2020). Additionally, focusing on design principles enables design practices to be adapted for usage in other fields (Dorst, 2015b).

Principles and methodologies are often part of a larger framework of systemic design. For example, Ryan (2014) suggests a framework for systemic design consisting of three mutually reinforcing layers: mindset, methodology, and method. All three layers, mindset, methodology and methods, are interconnected, with each new systemic design experience opening up possibilities for applying and co-evolving the practitioner's mindset, methodology, and methods (Ryan, 2014). See Figure 7 for an illustration of the interconnectedness of the layers.

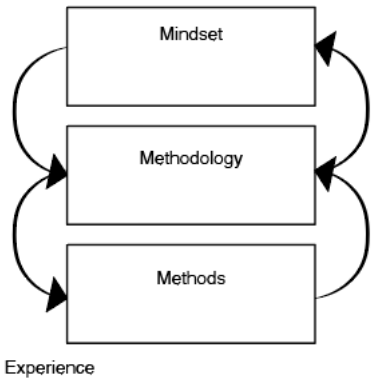

Figure 7: Three levels of systemic design (adapted from Ryan, 2014)

Another conceptual systemic design framework is proposed by Costa Junior et al. (2019). It was originally developed for a narrow context of energy solutions for low-income markets but has elements useful in other contexts where a systemic design approach is applied to complex societal problems. While Ryan's model has three layers, this framework is divided into five

clusters: mindset, methodology set, knowledge set, skill set, and tool set. These clusters are meant to assist designers in integrating systems thinking into design and thereby enable them to better handle complex societal problems. See Figure 8 for an illustration of the conceptual framework.

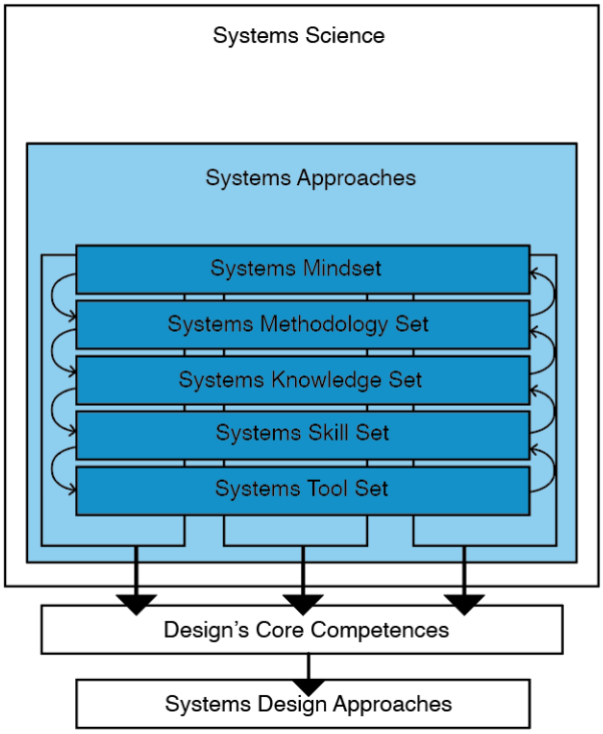

Figure 8: Conceptual framework for systems design approaches (adapted from Costa Junior et al., 2019)

Four sets of principles and two sets of methodologies were identified in the literature and regarded as more detailed, in order to obtain a more comprehensive understanding of systemic design in practice.

The four principles considered were:

1) Systemic design mindset by Ryan (2014)
2) Systemic design principles by van der Bijl-Brouwer and Malcolm (2020)
3) System-shifting design features by Drew et al. (2021)
4) Systemic design principles by Jones and Van Ael (2022)

The two methodologies considered were:

1) Systemic design methodology by Ryan (2014)
2) Systemic design stages by Jones and Van Ael (2022)

A summary of each of the four principles is provided in Table 2 and a summary of each of the two methodologies is provided in Table 3.

Systemic Design Principles

Table 2: Comparison of systemic design principles

Systemic design mindset by Ryan (2014)	**Systemic design principles by van der Bijl-Brouwer and Malcolm (2020)**	**System-shifting design features by Drew et al. (2021)**	**Systemic design principles by Jones and Van Ael (2022)**
Inquiring – curious, observant, asks rather than assumes	Opening up and acknowledging the interrelatedness of problems	Start from different ways of knowing	Participatory – the participation of stakeholders across existing systems boundaries
Open – defers judgment, seeks different experiences and perspectives	Developing empathy with the system	Assume interdependence from the outset	Anticipatory – multiple future contexts are entailed and represented
Integrative – seeks win-win situations, utilises tension between worldviews	Strengthening human relationships to enable learning and creativity	Take a stand	Disclosing knowledge – knowledge sharing among collaborators
Collaborative – listens actively, grows social cohesion	Influencing mental models to enable change	Focus on the potential system, designing propositionally	Experiential presence – engagement producing 'here and now' presence
Centered – reflective self-awareness, view challenges in larger context	Adopting an evolutionary design approach	Consider it as unfolding and generative process	Empowering – transforming people into agents of change

Systemic design mindset by Ryan (2014)	**Systemic design principles by van der Bijl-Brouwer and Malcolm (2020)**	**System-shifting design features by Drew et al. (2021)**	**Systemic design principles by Jones and Van Ael (2022)**
		Design-in-action through making	Open-ended – not bound to a specific outcome
		Tend to the collective	Pluriversatile – embrace pluriversal worldview
		Invest in a longer time-horizon	Numinosity and inner reflection – recognizes the mystery of human experience
		Build in a new set of system values	Multi-level and multi-perspective – altering between levels of abstraction and shifting perspectives
		Collaborate with other change disciplines	Formative - The order of activities is not fixed
		Seek shift and depth over scale	

Design principles can be observed from different perspectives, potentially influenced by the researchers' emphasis and understanding of systemic design, as shown in Table 2. While there is no definitive set of principles, there are recurring patterns and shared elements. The following descriptions encompass some of these principles, which are not solely derived from the four chosen principles but across the literature.

Embrace complexity:

Complexity is a profound element in systemic design and therefore acknowledging it, instead of simplifying or reducing it, is a crucial principle of systemic design. This means going beyond a surface-level understanding of a given system and delving into the intricate interdependencies that exist among its various elements. It also means acknowledging the cognitive factors involved in understanding the relationships within the problem's complexity (Jones, 2022). Systemic designers acknowledge that problems cannot be viewed in isolation; rather, they are interconnected components that require a holistic approach for effective solutions. By adopting multi-level approaches, these designers are able to explore a system from different perspectives and levels of abstraction, allowing for a comprehensive understanding of its dynamics. This understanding enables them to navigate the complexities and address issues in a way that considers the potential ripple effects on other parts of the system.

Plularity of perspectives:

Systemic design embodies a pluriversal worldview, embracing the idea of multiple perspectives and experiences. It is open-ended, meaning that it does not restrict itself to a specific outcome and remains flexible in its approach. This approach is inquisitive and curious, asking questions rather than making assumptions. To include a plurality of perspectives in the design work, collaboration and active listening to others are needed. The application of systemic design actively demands the participation of stakeholders across the system, ensuring that multiple voices and needs are considered in the design process. Banathy (1996) takes the participation of stakeholders even further and argues that nobody else other than the users of the system has the right to design them, it's unethical to design social systems for someone else. In contrast to other design approaches, systemic design does not have a singular end user and therefore, instead of exploring the perspectives, needs and aspirations of an end-user, the designers should explore the diversity of perspectives across stakeholders (van der Bijl-Brouwer and Malcolm, 2020).

Work with the invisible:

Working with the invisible means working with the invisible dynamics and social structures that exist within a system. Social structures are not just static entities, but complex webs of interconnected relationships that influence behaviors and outcomes. By analyzing these relationships and patterns, systemic design can help reveal the hidden networks and dynamics that shape the system (Rempt, 2023). A focus on relationships is at the core of systemic design. Therefore, interventions should focus on fostering relationships between actors in the system. However, the focus should be on designing conditions promoting the emergence of new behaviour within relationships (van der Bijl-Brouwer and Malcolm, 2020). Systemic

designers make tacit knowledge visible and design tangible things to navigate those dynamics (Drew et al. 2021).

Reflective awareness:

Reflective awareness involves being centered and self-aware in a reflective manner and viewing challenges in a larger context. Individuals who practice reflective awareness also understand themselves as part of the system they are operating in. Additionally, experiential presence is emphasized in systemic design, which means actively engaging in the present moment and being fully present in the here and now. Jones and Van Ael (2022) talk about spiritual, and deep inner knowing, and Drew et al. (2021) how systemic designers recognize their own assumptions, worldview, and influence on the broader system, and collaborate with individuals holding diverse perspectives to check their biases.

Systemic Design Methodologies

Table 3: Comparison of systemic design methodologies

Systemic design methodology by Ryan (2014)	**Systemic design journey methodology by Jones and Van Ael (2022)**
Inquiring – seeks external references beyond the team's existing knowledge base to enrich the design process	Framing the system – frames the scope and boundaries of the current system for the full design lifecycle process
Framing – selects, organizes, interprets, and comprehends a complex reality to provide reference points	Listening to the system – observes behaviours of the system
Formulating – defines the desired state, considers values and stakeholder interests, and transforms abstract ideas into tangible concepts	Understanding the system – explores the forces that create system behaviour
Generating – injects team-generated artifacts into the real world to foster learning	Envisioning desired futures – envisions possible futures desired by system stakeholders
Facilitating – regulates how the team moves between each of the other activities and manages the process	Exploring the possibility space – explores the most effective design interventions

Systemic design methodology by Ryan (2014)	**Systemic design journey methodology by Jones and Van Ael (2022)**
Reflecting – crucial activity promoting deeper understanding, self-awareness, and continuous improvement	Planning the change process – plans how to (re)organize, govern, and deliver on system value
	Fostering the transition – enables the actions towards change interventions to implement the interventions and strategy for the system transition

Ryan (2014) provides a methodology with six main activities, while the methodology provided by Jones and Van Ael (2022) has seven stages. Both methodologies are iterative and are not to be considered as a structured design methodology. Jones and Van Ael (2022) further divide the stages into phases, which is the division used also here. However, there are several other methodologies available that share some similarities. For instance, Reynolds and Rose (2024) provide a four-stage toolkit for systems practice, which includes comparable actions and tools. Additionally, Gaziulusoy et al. (2013) propose a three-phased scenario method for system innovation aimed at sustainability.

Phase 1: Understanding and framing:

Understanding and framing set the foundation for the systemic design. It aims at gaining a deep understanding of the situation and/or system at hand, making sense of a complex reality, and creating boundaries of the system by framing it. "*A frame is a perspective from which an amorphous, ill-defined problematic situation can be made sense of and acted upon*" (Schön and Rein, 1994, cited in Ryan, 2014 p. 9). According to Dorst (2015b), problem situations that are open, complex, dynamic and networked, require framing to make them amenable to solutions. Framing is also important for creating a shared frame of reference, "*which is a prerequisite for shared meaning and shared understanding among a team*" (Ryan, 2014 p. 9). In line with Werner Ulrich's thinking Jones and Van Ael (2022) remind us that the frame, the boundary of the system, is a choice and decision of the team and the stakeholders. There are often multiple overlapping systems so framing it is always somewhat subjective.

Both Ryan (2014) and Jones and Van Ael (2022) discuss the importance of bringing external knowledge and learning from the experience of system stakeholders. It can include more traditional (human-centered design) research, such as interviews, stakeholder ethnography and expert insights, or non-traditional data sources, such as art and social media. It's

important to remember that it is not just about information gathering, but its pivotal function lies in unveiling external viewpoints and diverse worldviews that provide opportunities for reframing (Ryan, 2014). Banathy (1996) even argues that everyone who somehow influences and is impacted by the design should be part of the designing process, anything else is unethical.

The aim is to understand the structures, influences, and process flows in the system as well as the behavior and relationships of system functions and have a coherent narrative about the core system issues. It's a process including inquiries and explorations, testing assumptions and viewpoints, and listening and observing to gather insights and data about the complexities and interdependencies within the system and analysing feedback and system dynamics.

This phase is messy and often uncomfortable and frustrating for the team. Framing includes important decisions about what to include and exclude from consideration and as Ryan (2014) mentions, people are not used to examining their own or other's frames. Teams may feel frustrated by the lack of clarity and certainty about the boundaries of the system or even which system they are talking about, and thus, about the problem they are addressing.

Visualization plays an important role in systemic design in general, but especially at the beginning of the process. Using visual mapping helps to cope with substantial amounts of fragmented data as well as all connections and relations within the system. Therefore, systemic design is known for its large maps.

Phase 2: Generating and envisioning:

The aim of this phase is to move from understanding the current system to envisioning future possibilities for the system. Just like the first phase, this phase is also a collaborative act, it's about imagining and cocreating possible futures desired by system stakeholders. In the field of futures studies, it is important to recognize that there is not just one future, but multiple potential futures. It is true also in the systemic design. This is because individuals exist within multiple interconnected social systems simultaneously, making it impossible to work with a single definite outcome. In order to explore and visualize these various future scenarios, methodologies such as those developed by Ryan and Jones and Van Ael incorporate the use of prototypes. These prototypes serve as tools to investigate and understand different possibilities within the system.

Phase 3: Exploring and planning the change:

The aim of this phase is twofold, one to find strategies for system interventions and, two, to plan the change and prepare the transition. It's a search process not aiming at identifying the best solution to a problem as there aren't any best solutions in complex systems (Jones and

Van Ael, 2022). A single design intervention alone cannot bring about the transformation of a complex system, therefore, the systems are explored, seeking multiple leverage points from different parts of the system as options. According to Jones and Van Ael (2022), Donella Meadow's 12 places to intervene can be useful in the search process as it aims to identify strategic points for intervention within a complex system, where a minor adjustment in one area can lead to substantial impacts throughout the entire system. Once the leverage points have been identified and interventions defined, there's design work to be done for interventions. It involves implementing the overall design strategy, organizing actions, and facilitating the team's movement between activities. There might be changes needed at different levels, e.g., at the organizational level, but organizational change is not the goal of systemic design, the aim is rather self-organization (Jones and Van Ael, 2022). However, Jones and Van Ael emphasize that in addition to planning the change, there's also a need to prepare for the execution of strategies for long-term value in the complex world.

Facilitation and reflection play a crucial role throughout the process. Designers plan the change process and facilitate its execution, considering how to engage stakeholders and navigate complex dynamics. It also encompasses critical reflection, self-awareness, and continuous improvement to deepen understanding and learning throughout the design process.

Table 4 presents a compilation of various methods alongside their corresponding description relating to each phase. This is not a rigid categorization; methods can be used in a flexible manner. The methods predominantly draw upon the work of Jones and Van Ael (2022) with certain supplementary contributions.

Table 4: Systemic design methods

Phase	**Method**	**Description of the method**
Phase 1:	System map	A system map is a visual representation that depicts the elements, relationships, and interactions within a complex system. Examples of system maps are for example, Social Ecosystem Maps or Influence maps (Jones and Van Ael, 2022).

Phase	Method	Description of the method
	Ice-berg	The ice-berg model is a tool to analyze a system in different layers (events, patterns, structures and mental models) (Reynolds and Rose, 2024)
	Giga-map	Giga-maps are large-scale system visualizations helping to work with super complexity, e.g., by supporting in framing of the system and sense-sharing across different perspectives. The process of giga-mapping entails the creation of expansive system maps that serve to expose the relationships and interconnections between various parts of the system (Sevaldson, 2011). Is especially valuable in sensemaking.
	Actors map	An actor map is a tool to identify and represent the key participants within a given system. Such participants may comprise organizations, individuals, and both human and non-human agents. Can be especially valuable to help identify and select the system participants at the

Phase	Method	Description of the method
		beginning of the process (Jones and Van Ael, 2022).
	Rich picture	A visual way to explore and the holistic context and multiple perspectives. Originally developed by Peter Checkland as a part of Soft Systems Methodology (SSM).
	(Rapid) ethnographic methods	Methods such as observation, interviews, or shadowing.
Phase 2:	Three Horizons	Three Horizons is a well-known method in strategic foresight to set a long-term vision and envision and plan for the future.
	System Value Proposition	Adopted from Strategyzer's Value Proposition tool, System Value proposition aims to assist in framing the value offered in the proposed system change or service system in three levels (micro, meso and macro) (Jones and Van Ael, 2022).
	Synthesis map	Inspired by Sevaldson's giga-maps, a synthesis map is a tool for understanding and presentation of complex system narratives (What is the issue?; Where is the

Phase	Method	Description of the method
		issue?; Who is involved?; How is it happening?; Why is it happening?) (Jones and Van Ael, 2022).
Phase 3:	Intervention Strategy (or other tools to identify leverage points)	Inspired by Donella Meadow's 'places to intervene' this tool aims to visualize a spectrum of possible proposals helping a team to construct a strategy (Jones and Van Ael, 2022).
	Flourishing Business Canvas	A visual tool to work on an enterprise's business model that recognizes its interdependencies with the economy, society and the environment (Upward, 2023)
	Change Readiness	Inspired by Steve Waddell's model of societal transformation systems, this tool is a checklist for internal evaluation of capabilities, organisational readiness, innovation capacity, and team development for a change (Jones and Van Ael, 2022).

Sensemaking

Sensemaking plays a crucial role in the practice of systemic design. It is not a step or phase in the process, but rather a practice happening throughout. It's about making sense of complexity and it "*can be defined as a collective attempt to form a coherent rationale to explain matters of shared concern*" (Jones and Van Ael, 2022 p. 8). UNDP (2021, p. 4) defines

sensemaking as follows: "*Sensemaking is an activity and a process that extracts insights, induces learning and creates meaning from experience*". Even though sensemaking plays a role throughout the process, it is used especially at the beginning of the process when there's a significant amount of data collected and immersed. Sensemaking can also be used in a portfolio approach where sensemaking can be used to reflect both the current portfolio of work as well as the pipeline portfolio.

Visualization

The way we visually perceive reality is very much connected with how we understand it (Ulloa, 2020), and thus, visualization plays an important role in understanding, communicating, and shaping complex systems. For example, according to Jones and Van Ael (2022) by visualizing, it is possible to gain insights into the behaviours that characterize systems and reveal the interconnectedness and hierarchical organization within social systems. Visualization can also foster shared understanding and collaboration among different actors in the system. Systemic design is often known for its large maps and most tools used in systemic design are visual in one way or another.

2.6 Innovation

Design and systems/design thinking have similar foundations and in some cases methodologies with innovation (OECD, 2017), and they are sometimes used interchangeably in the context of systemic change. There is no universally accepted definition of innovation. However, most definitions refer to generation, and especially the realization of novel ideas (Bessant & Tidd, 2020). Joseph Schumpeter, a pioneer of the economic analysis of innovation, defines innovation as the creation of new, technologically feasible, commercially realizable products and processes (Ahrweiler, 2010). While in the private sector, innovation can be a competitive advantage itself, innovation within the public sector serves a different purpose in which innovation is justified only if it increases public value (Hartley, 2005). Similar to design approaches, innovation is also celebrated as a means of addressing societal issues and as a consequence, there has been a growing interest in exploring design practices to enable innovation in the public sector (Malcolm, 2017). For instance, over the last decade, there has been an increasing focus on incorporating design and innovation capabilities into public organizations through innovation or design labs (Ulloa, 2020).

Although innovation is not a synonym for technology, it is frequently perceived as such. Within these technology-centric innovation narratives, the emphasis is on the necessity for novel solutions, and innovations, to improve situations. However, in the context of societal change, and complex situations, this perspective falls short (Seppälä, 2022a). The limitations of innovation in addressing complex problems are similar to those of design, which were discussed earlier in this thesis. The conventional, linear approach to innovation fails to

provide solutions to complex situations. Innovation scholars advocate for shifting away from singular, quick fixes and adopting a continuous innovation approach suited for complex contexts (van der Bijl-Brouwer et al., 2021). You can't change complex systems by changing parts, but you can change interactions. Therefore, instead of attempting to resolve a specific problem, the focus should be on changing the ecosystem (Snowden, 2024). According to Schmachtenberger (2024), rather than innovating single solutions, often technological ones, it is more crucial to innovate the process of innovation itself, how to innovate, without causing negative externalities in society. Transformative innovation isn't about individual solutions but rather requires multiple aligned innovations to create a new societal logic (Seppälä, 2022a).

This, multiple aligned innovations to make a change, is called innovation portfolios and sometimes system(s) innovations. The core of this is to have close interaction between connected projects or experiments fostering collaboration and mutual learning – a shared impact arises from actions driven by that shared understanding (Seppälä, 2021). Innovation portfolios and systems innovation are used especially when discussing major system-wide transformations in a society. In system innovation theories, the emergence of novel solutions may need the destruction or disassembly of existing infrastructure (OECD, 2016).

The thesis only briefly touches on innovation to acknowledge its relevance to the topic of systemic design. The coverage is limited as it is not the primary focus of this thesis.

2.7 Organizational Transformation

The term 'organizational transformation' is being used in this study to refer to the change in an organization's meta-rules (rules of rules), underlying assumptions, worldviews, or paradigms (Levy and Merry, 1986). While organizational transformation research shares connections with both organizational development and change management, it is distinct from each. Korpikoski (2023) discusses these nuances and interconnections in their thesis, wherein organizational development research focuses on proactive processes on how to facilitate planned change (traditionally focused on incremental organizational change) whereas organizational transformation deals with more significant stages and transitions affecting the organization as a whole. According to Bartunek and Louis (1988), organizational transformation and organizational development are just two different approaches to understanding organizational change.

Organizational culture plays a significant role in organizational change as changes in the culture are linked to organizational transformation (Ruigrok and Achtenhagen, 1999). While there is no precise definition of organizational culture, it is sometimes defined as "*our shared values, the way we do things around here, or the rituals and stories we share when bringing someone new into the organization*" (Marker, 2009 p. 725). Schabracq (2007) suggests that

organizational culture is very much intertwined with the individuals within the organization. Consequently, cultural change necessitates individuals to change their assumptions, goals, and subsequent behaviors. Korpikoski (2023) also emphasizes the pivotal role of individuals within organizations, arguing that fundamental shifts in attitudes, mindsets, and beliefs among individuals serve as catalysts for wider organizational changes and working cultures. This is in line with Junginger and Sangiorgi (2009), who argue that organizational transformation entails a shift in the fundamental assumptions, beliefs, norms, and values held by individuals. Since culture is often an invisible phenomenon, it is difficult to shape. According to Ulloa (2020), while individuals within organizations may collectively identify and agree upon necessary changes to enact a new experience among staff or the people they serve, they might not be fully aware of or in control of the unseen forces that influence their daily practices. Organizational culture presents a common challenge for design practitioners (Sangiorgi, 2011).

Levy (1986) calls transformation change a second-order change (as opposed to first-order change consisting of minor improvements) and argues that change in organizational culture alone is insufficient for facilitating such transformation. Instead, change must occur across all four dimensions: core processes, mission and purpose, culture, and organizational worldview or paradigm.

Integrating Design into an Organization

While research on embedding systemic design into organizations is limited, examples like Kaur's (2021) study provide insight into this topic. Kaur (2021) studied systemic design within the Australian Taxation Office. Some of their learnings include the importance of maintaining continuous capability and knowledge-building mechanisms, such as allocating time for reflection, learning and sharing experiences. Additionally, it highlighted the importance of raising awareness about systemic design and implementing broader organizational shifts to enable a systemic approach, which includes, for example, governance, funding, and strategy.

Additional insights gathered from studies focusing on embedding service design and co-design into an organization can offer valuable lessons. Research has demonstrated that organizations integrating service design into their processes and strategies should expect a comprehensive transformation at the organizational level because service design also impacts how an organization changes internally (Korpikoski, 2023). For example, Shah et al. (2006) suggest that to overcome barriers to becoming a more customer-centric organization, the organization has to have a strong leadership commitment, organizational realignment, systems and process support, and revised financial metrics in place. Malmberg (2017) emphasizes that simply raising awareness of design or building design competence is insufficient. For organizations to truly benefit from design, they must integrate design

practices into their structure by adjusting or creating supportive systems. Otherwise, it will be difficult to gain the value of design.

3 Methodology

This chapter outlines the research methodology adopted in this study to address the research questions and fulfill the development needs of the commissioning organization. It covers key topics: research approach and design, data collection and analysis, and workplace development. Chapter 6 provides a more detailed description of the workplace development aspect.

3.1 Research Approach

In this study, experiential qualitative research methods were employed, as opposed to critical qualitative methods. Experiential qualitative research seeks to make sense of how individuals perceive, understand, and experience the world from their personal viewpoints. In this approach "*research becomes a process of collecting such information, and then putting an organizing, interpretative framework around what is expressed in the data*" (Braun and Clarke, 2013 p. 28).

Various logical reasonings are applied in different types of studies: induction, deduction, and abduction (Reichertz, 2014). In short, induction entails progressing from observations to theory, while deduction involves moving from theory to observations (Robson and McCartan, 2016). Abduction, however, combines elements of both induction and deduction and is often referred to as a blended approach, which is the most commonly used (Linneberg and Korsgaard, 2019). Given that the aim of this thesis was not to test a specific hypothesis or theory but rather to comprehend a phenomenon and establish a framework for it, and transform it into something practical for the commissioning organization, the abduction approach was deemed most suitable for this research.

3.2 Research Design

Research design comprises the overarching strategy for answering research questions, containing objectives, data collection methods and constraints to be taken into account (Saunders et al., 2007). The research design is always a compromise constrained by the realities of the given situation, so it is more of a question of where it is acceptable to compromise, a topic explored further below.

In this study, the development of the research design followed an iterative process involving continuous exchange between the researcher and the commissioning organization. The

objective was evident from the outset, as the commissioning organization aimed to gain knowledge and a deeper understanding of systemic design. They sought insights into what approaches have worked, what could be working, and how to get started. They wanted to have an overview of a field, systemic design, that is frequently perceived as complex, theoretical, and sometimes challenging to comprehend. Initiating the process can be daunting, particularly when faced with extensive jargon within the field and a lack of familiarity with all its intricacies. Since the beginning the commissioning organization wanted the work to be broadly applicable and not restricted to the organization or the field of social insurance, thus ensuring that other organizations, particularly those in the public sector, could also benefit from the results.

Data collection involved conducting interviews mostly with individuals outside the commissioning organization (for additional details on participant selection, please refer to Chapter 3.3). Given the organization's limited expertise in systemic design, seeking insights from external sources with advanced and recognized experience in the field was deemed essential. By incorporating perspectives from a diverse range of experts and practitioners, the research design aimed to provide comprehensive and valuable insights that could inform and guide the organization's efforts to enhance its understanding and practices related to systemic design.

Workshops were also considered as a research method. However, the commissioning organization has experienced designers in-house, and recently also designers with experience on systemic issues, so it was seen as more beneficial to increase their knowledge base on the topic, providing additional information they wouldn't have access to otherwise. Together it was decided that the most beneficial, given the need of the commissioning organization and the limitations in a single thesis, was to package the information and knowledge in a way that benefits the in-house designers (and others) in their work.

3.3 Data Collection

Interviews

The use of interviews can help to gather valid and reliable data that are relevant to the research question(s) and objectives at hand (Saunders et al., 2007). The research topic, objectives, and questions constitute the basis for the subjects to cover and questions to ask during the interview. However, the spontaneous conversation may also provoke unforeseen areas and perspectives for further investigation (Saldaña, 2011).

Interviews can be divided into three types of interviews: structured interviews, semi-structured interviews, and unstructured or in-depth interviews (Saunders et al., 2007; Robson and McCartan, 2016). The structured interviews are highly standardized while less structured

approaches allow the person interviewed much more flexibility in their response (Robson and McCartan, 2016).

In this study, the data was collected through semi-structured interviews. For semi-structured interviews, it is typical for an interviewer to have an interview guide that serves as a checklist of topics to be covered, but the interviewer can modify the wording and the order of questions based on the flow of the interview (Robson and McCartan, 2016). It is also possible to ask unplanned questions to follow up. For this study, an interview guide was prepared, including themes and essential questions. However, the guide's usage was flexible, adjusting the interview context, and spontaneous questions were asked during interviews to follow up on what an interviewee said. The interview guide is included in Appendix 1.

For the participant selection in this study, a multi-faceted approach was employed, and the strategy was purposive. Recruitment criteria for interviews were as follows: the content of work related to systemic issues, presumably has an idea about systemic design, and either work in the public sector or has professional engagement with it. The commissioning organization demonstrated a strong interest in acquiring knowledge from external sources, specifically valuing insights from organizations and individuals who have advanced experience in systemic design work and recognized experience in the field. Therefore, participants from outside the commissioning organization were especially sought, including professionals beyond the borders of Finland.

First, participants were sourced through the commissioning organization. Second, the author leveraged their existing professional network to identify and engage potential interviewees who had a direct connection to the research topic. Third, the author sought assistance from an established expert in the field, who provided introductions to key individuals. This expert's insights and network played a pivotal role in expanding the pool of participants. In addition to these methods, a snowball sampling approach was implemented. In snowball sampling a researcher identifies one or more individuals and after they have been interviewed, they are used as informants to identify other interviewees, etc. Snowball sampling can be seen as a particular type of purposive sample (Robson and McCartan, 2016). In this research, initially, individuals obtained through the commissioning organization, the author's network, and the expert's introductions were asked to recommend and connect the author with additional potential interviewees.

Individuals in the Study

In total 11 interviews were conducted. Five interviews were conducted in Finnish and six interviews in English. Interview sessions lasted between 40 min to 75 min. All interviews were conducted in Zoom apart from one that was done in Microsoft Teams. All interviews were

recorded. Participants' anonymity was considered and therefore, individual names, specific work roles, and the names of the organizations are anonymized throughout this thesis.

Six interviewees were based in Finland. Four of them were from Finnish government agencies, one from a state-owned company, and one was an independent consultant. Two of the interviewees from the Finnish government agency were from the commissioning organization. Five interviewees were based outside Finland. Two were from an intergovernmental organization, one from an EU-supported initiative, one from a foundation, and one from a prime minister's office (of a country not Finland). All those interviewees' current work or the work they referred to in the interviews was global and/or their organizations are well known for their work on systemic issues. See Table 5 for an overview of the interviewees and their affiliations.

Table 5: Interviewees and their affiliations

Location	**Affiliation**	**Number of Interviewees**
Finland	Finnish government agency	4
Finland	State-owned company	1
Finland	Independent consultant	1
Outside Finland	Intergovernmental organization	2
Outside Finland	EU-supported initiative	1
Outside Finland	Foundation	1
Outside Finland	Prime minister's office	1

The interviewees were individuals with diverse and extensive experience in the field of design and innovation. Seven out of 11 participants had a design-related title, while two participants had an innovation-related title. In addition to them, there was one Lead and one Director. See Table 6 for a breakdown of the titles. The amount of experience interviewees had on systemic design varied from those who acknowledged dealing with systemic, complex issues, but who were only starting to familiarize themselves with systemic design to those with several years of experience in systemic work in complex settings.

Table 6: Titles of interviewees

Title	**Number of Interviewees**
Design-related	7
Innovation-related	2
Lead	1
Director	1

3.4 Data Analysis

In research, simply collecting data isn't sufficient; the data needs to be analyzed, to make it tell a 'story' (Linneberg and Korsgaard, 2019). In this study, the data was analyzed using thematic analysis. The analysis process was an iterative multi-step process. Coding plays an important role in qualitative analysis as it reduces large amounts of empirical data and makes it accessible for analysis. Furthermore, this process simultaneously increases the overall quality of the analysis and findings (Linneberg and Korsgaard, 2019).

All interviews were transcribed by using Microsoft Stream, and thematic coding was done by using Quirkos, a qualitative analysis software. Some of the key advantages of using software are, for example, that they can handle large amounts of data very quickly (Robson and McCartan, 2016) and the program helps to keep everything organized and makes it easy to find the material later in the analysis (Gibbs, 2014). The Finnish transcriptions were analyzed in Finnish, and only the quotes included in this thesis were translated into English.

The data analysis process was divided into four phases. See Figure 9 for a visual illustration of the data analysis process.

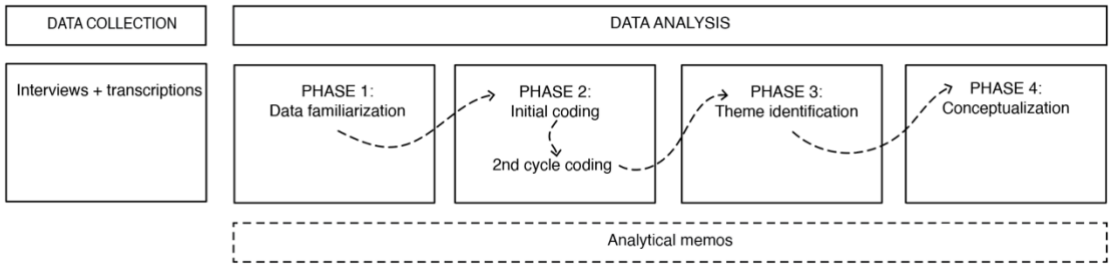

Figure 9: Data analysis process

The first phase of the data analysis happened before the actual coding when the author familiarized themselves with the data. This phase aims to make the researcher acquire an in-depth understanding of the dataset and begin to notice things that could potentially be relevant to the research question (Braun and Clarke, 2013). During this phase, two overarching themes were derived from the researcher's initial analysis of the interviews and the research questions.

The second phase, the actual coding phase was divided into two. First, initial codes were assigned based on the significance of the information, alignment with the research questions, and any unique or unexpected insights. During this phase the author maintained an open-minded perspective, allowing the interviewees' narratives to guide the coding process. After this phase, following the initial coding, the researcher delved deeper into the data by revisiting the interview recordings, taking new notes, and reviewing and comparing the original interview notes to the new notes. This process led to the creation of new codes and the consolidation of existing ones. Altogether there were 90 codes created. See Figure 10 for an overview of the codes in Quirkos.

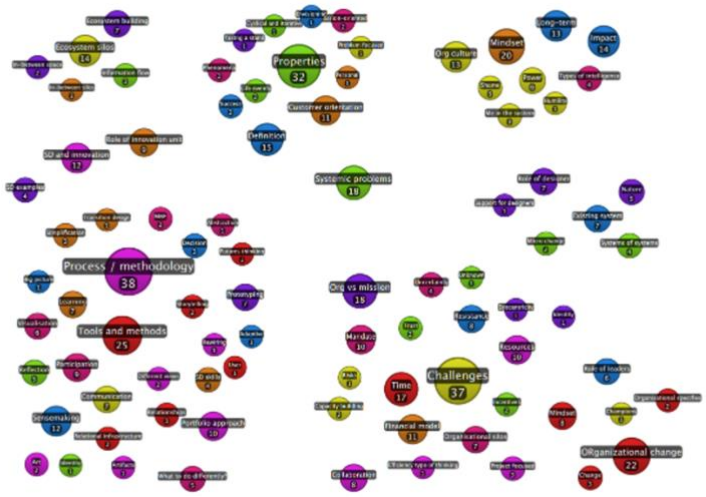

Figure 10: Overview of codes in Quirkos

In the third phase, thematic patterns, i.e., concepts, topics, or issues to which several codes relate (Braun and Clarke, 2013), were looked at and codes were categorized based on them. As a result, eight thematic categories were created, including the two original themes (slightly modified). These themes served as a basis for further analysis and interpretation of the data.

The phases of data familiarization, initial coding, and theme identification often merge with one another, making it difficult to separate them, as noted by Robson and McCartan (2016). This was similarly observed in the present study.

After these three phases, there was the fourth, and last phase, the conceptualization, i.e., the actual interpretation of the data, connecting it to the research questions, and tying the data and analysis into existing literature (Braun and Clarke, 2013). This phase was an iterative process between writing, sketching, and going back to the data. As Braun and Clarke (2013, p. 564) argue, "*You cannot really do qualitative analysis without writing it. You can have insights and thoughts, but you can't complete your analysis of the data and then write it up, because qualitative analysis is writing.*"

Overall, analytical memos, the author's ongoing written reflections, were used in parallel with the data analysis process as they help to think about different elements and thus, "*bridging the distinctions between coding, analysis and result*s" (Linneberg and Korsgaard, 2019 p. 266).

3.5 Workplace Development

The concrete outcome of this thesis is a booklet tailored for designers and others within the commissioning organization. The purpose of this booklet is to support people engaged in systemic work and aid in facilitating communication about this type of work, both within the organization and when engaging with external stakeholders. The development of these materials involved an iterative process, incorporating feedback on various aspects. The materials and the development process are described more in detail in Chapter 6.

4 Results

In this chapter, the findings of the interviews are presented, and they are categorized into three key aspects: perceptions of systemic design, approaches and methodologies to systemic design, and challenges of systemic design. The analysis of the interview data revealed a diverse array of themes, but the selection of these specific themes was guided by several factors. These factors included their frequency of mention, their capacity to offer novel and unexpected insights into the topic, and their alignment with the research aim.

4.1 Perceptions of Systemic Design

This part of the chapter is divided into two: defining systemic design and some distinguished attributes of systemic design. The first part aims to depict the variety of ways interviewees defined systemic design, whilst the second part lists some elements prominent to systemic design that emerged from the interviews.

Defining Systemic Design

Interviewees defined and understood systemic design in various ways. Perceptions about systemic design differed from inter-administrative cooperation to how different actors work together in an ecosystem; from understanding a complex, systemic problem or issue to connecting dots and not having a siloed approach; and from designing interventions to different layers of the system to disrupting the current way of designing. Regardless of the differences, there were many similar elements, words and terms used, when describing what systemic design means to them. Some terms mentioned were, for example, *complexity, holistic, interdependence, interconnected, relationships, cyclical, iterative, root cause, and problem/mission-oriented*. Systemic design was mostly discussed from the point of view of one system (sometimes with a notion of how different systems are interconnected) with one exception who described their work falling 'in-between systems'.

Some interviewees talked more about structures and seemed to look at systemic design from the organizational point of view. For example, by trying to identify the framework, the existing systems, and structures within which one operates or by describing systemic design more in a way to design a service relevant to their organization and their customers, but keeping the bigger picture, i.e., the system, in mind.

> *"Things could be integrated so that they form a clear, unified whole, and there's a bit of a one-stop-shop principle thinking, making it easy for the service user to get a comprehensive view of what's happening, when, and why."*[1] *(INT-3)*

The majority described systemic design through complex, systemic issues or problems at hand involving multiple elements. The behavior of people and certain guiding mechanisms and their mutual dependencies may not necessarily be very well understood so systemic design was seen as an approach to better understand them as well as behaviors, structures, and mental models. These explanations highlighted the complex and interconnected nature of the elements within these issues or problems.

> *"It's an approach that tries to understand issues, driving down to the systemic roots of issues, and understand where they fit from a system perspective, which means you don't start from your own internal organization, but you try to understand the nature of a problem first." (INT-5)*

[1] Translated from Finnish into English

> *”We're dealing with something that's influenced by many organizations, individuals, functions, like a system larger than the issue itself. People's behaviors and certain guiding mechanisms and their interdependencies may not be very well understood”*[2] *(INT-6)*

However, nuances emerged in how participants approached systemic problems. While there was a consensus on the definition of what constitutes a systemic problem, one interviewee offered a unique perspective. They suggested that inherently there might not be systemic problems. Instead, those things we call problems are the undesirable or unintended system's outcomes.

Systemic design was also described through principles. For example, as follows:

> *“[--] first we're not looking at parts of the system, but we're looking at the relationships and interconnections. And then secondly, we're really working with power structures in the system. So, we're moving from the hierarchical one-way directionality to more collaborative participatory decision-making and participatory design as well. We're looking into moving away from linear thinking when it comes to all sorts of processes to more cyclical and iterative processes. And then we're also looking not necessarily at the final outcomes of the system as the key kind of focus, but more at the process and the learning process and the learning journey that we have throughout moving from where we are now towards where we wish to be in the future.” (INT-8)*

The explanations provided by interviewees regarding systemic design introduced a spectrum of perspectives, yet these perspectives were not mutually exclusive. For instance, those who initially viewed systemic design through the lens of addressing complex problems might have subsequently delved into discussions about systemic design principles when the interview shifted to topics like systemic design methodologies. Additionally, complex problems were discussed by most interviewees regardless of how they perceived systemic design in the first place.

An interesting observation emerged from the interviews, particularly among participants working across various public sector institutions in Finland. These individuals placed a strong emphasis on customer orientation within the systemic design, or even more, they viewed systemic design through the lens of customer needs and life events. Life events are events that require individuals to engage with services offered by multiple government authorities. Such life events were seen as important opportunities to foster collaboration among different

[2] Translated from Finnish into English

institutions, all working cohesively towards a shared objective: meeting the needs of the customer.

> *"Well, human-centricity is like, surely essential there. Perhaps the human is the one who connects those different actors, and then they delve into the challenges [--] from different perspectives."*[3] *(INT-2)*

> *"So that the customer perspective could be brought into that action and kind of concretize and clarify it, that in that systemic spaghetti. And in a way, all those actors involved in that spaghetti, so, like, that they would be offered opportunities to make that spaghetti simpler and more manageable for them."*[4] *(INT-1)*

Conversely, some individuals engaged in organizations that operate across sectors highlighted the importance of considering nature in systemic design. They argued that human-centric approaches alone are no longer sufficient, emphasizing the necessity of incorporating non-human-centered principles into systemic design.

Systemic design, as a whole, was primarily perceived as an action-oriented approach. While acknowledging the importance of understanding the complexities and interconnections within a system, this understanding was not confined to analysis but was considered a prerequisite for initiating change within the system, addressing complex issues, or designing services within complex systems. The interviewees, when reflecting upon their understanding of the approach, explained the role of design in the realm of action.

> *You always look at what's the object of your design, and then if it's something that you're trying to change if that's a social process if it's a social system that you're trying to change. And then you are in the field of systemic design." (INT-9)*

> *"I'm a bit hesitant about using the word "design" there, but okay, let's say it's systemic design, so... Trying to, like, understand the system and its direct and indirect effects and cause-and-effect relationships and looking at where one could bring about greater change. And understanding that it's not [--] clear and linear, there's no silver bullet, there's not one solution, but by understanding the system, one seeks to experiment and explore possibilities to*

[3] Translated from Finnish into English
[4] Translated from Finnish into English

> *influence the bigger picture. Maybe design comes through that process."*[5] *(INT-4)*

Some Distinguished Attributes of Systemic Design

When discussing systemic design, a series of distinct attributes emerged during the interviews. These attributes began to take shape as participants delved into the topic, shedding light on the key elements that define systemic design and make it different from other design approaches.

Interconnectedness

The majority of participants mentioned interconnectedness when discussing systemic design and its attributes, emphasizing its fundamental role. However, there were differing perspectives on the role of interconnectedness in systemic design. Some participants viewed interconnectedness primarily as an aspect of systemic issues. They believed that addressing interconnectedness was essential when tackling these problems. In contrast, another group regarded interconnectedness as a more profound and fundamental element that significantly contributed to systemic design. For them, interconnectedness acted as a catalyst, fostering innovation and opening up new possibilities within the system.

Learning mindset

Almost all interviewees talked about how systemic design requires a different mindset. Mindset can mean various things, but what especially was highlighted was continuous learning and the concept of the unknown. The acknowledgment of the unknown was regarded as an integral part of systemic design, and a primary approach to addressing it is through learning. Learning forms a substantial component of systemic work, manifesting itself prominently in discussions concerning the essence of systemic design and its methodologies, including sensemaking—a topic explored in the next section.

Interviewees expressed their perspectives on the learning mindset as follows:

> *"But it's not static, it's learning because we are acknowledging that we cannot really... We don't really know all about the complex issues. So we need to be in that way learning from it while we are in the system." (INT-7)*

> *"So, we see this as a learning process and we understand we have an impact agenda and one part of it is constant sharing and collaboration" (INT-11)*

[5] Translated from Finnish into English

> *“Another concept that I want to bring in is the concept of unknowns and understanding that whatever information that we carry is, is just a fraction of what is actually there in place in terms of the impacting the system.” (INT-8)*

> *”It requires a certain humility or understanding that... that development also happens through learning”[6] (INT-4)*

These discussions collectively underscore a broader shift not only in mindset but also in the fundamental approaches to thinking, reasoning, and problem-solving. With systemic design, there's a profound recognition that we don't possess all the answers, and this realization has the potential to lead to a significant paradigm shift. One interviewee eloquently articulated this transformation:

> *“So, but the capability it's so different, it's so different. The logic, the mindsets, [--] especially in the [field of work], we all think we are experts of something and we provide best practices and signature solutions and whatever. And then suddenly we go and say, hey, yes, we don't know, we don't know about these things, [--] we don't offer any more solutions. We offer processes and that's also a change of the service model. That's totally changing our identity, the way we offer services, the way we design, we implement programs. That's a huge shift” (INT-7)*

Time horizon

Another attribute of systemic design relates to its time horizon. Generally, there was a shared understanding that systemic design operates on a long timeline, requiring a commitment to long-term thinking. However, it was also acknowledged that maintaining the patience required for this extended approach can be rare as there’s rather an expectation of quick fixes. This extended commitment, while demanding, encourages a more exploratory and adaptive position, fostering a deeper understanding of complex systems and/or problems.

It's important to clarify that a longer time horizon in systemic design doesn't imply inaction or stagnation. On the contrary, interviewees highlighted the importance of engaging in experiments and exploring various solutions during the systemic design process.

One interviewee brought attention to this aspect, stating,

> *”Something that we just don't like to accept is that it takes time, especially the transformation takes time. Like we all want to have these super quick*

[6] Translated from Finnish into English

> *fixes and we all like to talk about these stories, but I think we are kind of perpetuating that trope or that lie a little bit." (INT-9)*

Another interviewee emphasized the need for humility, understanding, experimentation, and a departure from the conventional notions of change, such as the rapid change mindset associated with design sprints. Instead, systemic design encourages a more investigative approach.

> *"But it requires humility and understanding and experimentation, and one must, like, abandon those somewhat fixed notions of time frames for change [--] design sprint ideas and such, but rather more of, like, exploration"[7] (INT-4)*

Power

It was widely understood that systemic design is collaborative and requires an inclusive approach that actively engages diverse stakeholders. This inclusivity extends beyond organizational boundaries and exceeds traditional hierarchies, emphasizing a shared commitment to understanding, co-creating, and collectively shaping the dynamics of complex systems. Several interviewees underscored the significance of recognizing and addressing power dynamics and power structures as an integral component of systemic design work and potentially moving away from hierarchical decision-making to a more participatory one.

> *"So how do you actually engage? Because this ultimately means you're not in power anymore, right? Or at least it's a shared power in terms of what we understand is happening and [--] how we pivot. And it's not only shared with the people inside, you know, in a place where you're working but also eventually with the donor." (INT-5)*

One interviewee emphasized how systemic design isn't, or at least shouldn't be a competition where one party wins at the expense of others. Instead, it's about striving for the well-being of the entire ecosystem, ensuring that everyone benefits. This approach challenges the conventional notions of competition and introduces a more cooperative ethos where collective well-being takes priority over individual gain.

> *"It's not about who wins more, it's about like when we reach the well-being of an ecosystem, everybody's well off and this whole concept of greed is also playing a really interesting role here." (INT-8)*

[7] Translated from Finnish into English

Holistic and personal

Engaging in systemic design or systemic work is, for many, a profoundly holistic experience, extending beyond technicalities, tools, and methods. It involves a diverse range of elements, such as various types of intelligence and a wide range of emotions.

One interviewee articulated this holistic perspective by emphasizing that our cognitive intelligence is just one part of our capacity. In addition to cognitive intelligence, we possess emotional intelligence, bodily intelligence, and more, all of which contribute to the multifaceted nature of systemic work.

> *”And I think that our brains are brilliant, but we're using just a fraction of our capacity because apart from the brains, we also have our intelligence like emotional intelligence, intelligence of the body.” (INT-8)*

Moreover, systemic design entails navigating complex emotional terrain. Fear of uncertainty and taking risks were mentioned by several interviewees, emotions that are common among those striving to create something new or effect change. Acknowledging and managing them is an integral part of the systemic design.

> *“Yeah, it seems to be a really big piece of it, like, if, we have to tolerate uncertainty and, like, we have to accept or be open to the idea that systems might surprise us.”*[8] *(INT-4)*

Furthermore, systemic design involves the creation of narratives, where practitioners need to recognize that they will never have access to the complete truth. This is related to the concept of the unknown discussed earlier in this section and how practitioners must be able to live with it.

> *”There's this tendency of saying we need to speak to the user. And we need to speak to every single individual and every single group… and the truth is, in the end, you know, you will never know the complete picture anyhow, you can do that to some extent, but then you need to feel comfortable to take extrapolate from that yourself. You will never know kind of the reality out there. That's probably where narratives come in. You will always be part of creating those narratives. So, you need to get comfortable in the beginning that you're part of that. [--] There's no truth that you can kind of work from.” (INT-9)*

[8] Translated from Finnish into English

In this holistic perspective, individuals engaging in systemic design understand that they have an active role within the system. This realization includes acknowledging that they are both contributors to and shapers of the system's narratives and outcomes, recognizing their agency and influence.

> *”I am not a victim of the system. I'm actually [--] I'm the villain. I'm not the victim and [--] that is a huge thought. And it's really challenging and it's overwhelming and it's scary, but at the same time, once I start understanding that I'm not a victim, that I am the villain, it gives me the agency and power to start making different choices and shifting the systems that I'm part of in a different direction.” (INT-8)*

4.2 Approaches and Methodologies to Systemic Design

This section aims to shed light on approaches and methodologies interviewees introduced and discussed during the interviews. The section does not repeat each process but aims to provide an overview of the processes described and the different elements related to them.

Approaches

Interviewees demonstrated varied approaches to what might be termed systemic design, sometimes using alternative terms like systems innovation or portfolio approach.

Interviewees were divided into those with several years of experience in systemic design, and those who acknowledged dealing with systemic, complex issues but lacked a predefined approach to systemic design, either individually or within their organizations. Four interviewees detailed a systematic process comprising distinct phases or steps regularly employed in their systemic work. All of them emphasized that the process is flexible, adaptive, and dependent on the context and people they are working on.

The four processes described in the interviews had three to five phases some including several sub-steps or activities. Approaches and processes were partly overlapping and there were a lot of similarities in their approaches. Some interviewees representing different organizations had borrowed elements from each other’s approaches.

Understanding/exploring the system

An important observation obtained from the interviewees’ descriptions was their strong emphasis on comprehending and learning about the system, as well as our role within it. All the methodologies discussed initiated with an initial phase focused on understanding and exploring the current system. Some questions to be asked during this phase, were mentioned, such as: What constitutes the current reality? What are the current problem areas we are

working with? What is the status quo? Who are we in the system? What are our available resources, capabilities, and needs? And how does information flow in the system?

Some interviewees emphasized that this phase included a crucial element known as ‘intent’. One interviewee described intent as an overarching ‘North Star’, explaining:

> *“We start with setting the intent for the portfolio [--]. Basically defining the system, you know, what is, what is the system that you want to transform, what are the key effects that you want to see happen in that system.” (INT-10)*

Some interviewees included envisioning the future right in the beginning while others deliberately tried to stay away from it. For example, one interviewee described the role of visioning as follows:

> *”So we start with the phase so-called intent which is basically the space for us to convene our stakeholders, [--] diverse stakeholders who are affected or part of the specific system. And with them, the first step is we're trying to kind of cocreate a vision of what would be [--] that future that all the diverse stakeholders would want to be part of cocreating or like what is the intentionality and directionality of the change that we're all kind of working towards.” (INT-8)*

Another interviewee placed greater emphasis on understanding the identity of the organization and spent more time examining it. They deliberately emphasized studying the system they aimed to change and the position of the organization, rather than going for the potential vision for the future at this stage.

> *”So to understand who am I in the system, [--] who trusts me, how am I part of this and what resources and capabilities do I have? What partnerships do I have? [--] where am I here and where can I start working and where can I start learning about the problem? So, we're trying to go away from the aspirational, this is the great change that we want to make, which is again very problem-focused back to what's the status quo, actually, what's that system and who am I in that system.”* (INT-9)

All methodologies had a strong emphasis on understanding the system and/or the issue at hand. The emphasis was on refraining from immediate solution-oriented thinking, as systemic issues were not seen as problems to be simply solved. Instead, the emphasis was on understanding what surrounded the problem, including factors like identity and values. One interviewee illustrated this by sharing an example where a conversation about employment

evolved into a discussion about daycare and, subsequently, values related to children's well-being in a kindergarten:

> *"How do we then outline [--] those themes that kind of relate to employment [--] and then sort of a discussion on values, and this discussion on values is related to Finnish families, that we kind of have a lot of thinking, [--] , is it good for a child to be and what is the [--] age child can be taken to daycare and so on. And then it starts to find, [--] sort of this value cloud and then, perhaps the interest of the municipalities is found, [--] through discussion that there are the right people and we don't start thinking about the solution but we kind of ponder what things are around it."*[9] *(INT-2)*

Another interviewee emphasized the importance of shifting the focus from the problem to understanding the system:

> *So it's basically trying to say what's the system that I'm looking to change rather than what's the problem I'm looking to change." (INT-9)*

Understanding the system appeared to involve an ongoing process of exploration and synthesis. Various methods were mentioned, including, system analysis to understand system structures and dynamics, diverse mapping exercises, and models like the iceberg model. Additionally, conventional design methods, such as interviews and personas were used along with strategy tools to identify areas for change. Some also employed traditional futures and foresight methods such as understanding key trends and signals.

Interventions

Most interviewees discussed how there's no single solution to systemic issues but rather a collection of interventions or experiments. Several described methodologies included designing portfolios regardless of whether their organization's approach was called a portfolio approach or not. Interviewees talked about a portfolio of interventions, a portfolio of experiments, a portfolio of projects, or a portfolio of experiences, depending on their approach.

> *"Doing and implementing several interventions at the same time, which are grouped as a portfolio which are connected with each other. They are learning from each other. So it's dynamic and they can be changed while the context and the system is changing while we learn more about it." (INT-7)*

[9] Translated from Finnish into English

> *”So we're not trying to find that one red pill that would fix at all, but we're looking into portfolio of different interventions in the system. That would enable experimenting and seeing how those interventions [--] that work in the system in a specific entry point in specific domain. But then we create the kind of like an ecosystem of these or portfolio of these interactions and we facilitate the knowledge exchange and learning between these projects.” (INT-8)*

One interviewee mentioned a separate aspect of their approach: a dedicated framing phase while some others noted that framing was an integral part of their overall process. The concept of framing was elaborated as establishing a boundary for a portfolio, whether geographical or thematic or serving as a container for innovations aimed at bridging the gap between the current reality and the envisioned future that participants were collectively striving to achieve.

Learning and Sensemaking

Learning was featured significantly in the interviews, with a consensus that it plays a crucial role in systemic design. At the very least, learning was viewed as a foundational step at the beginning of the process to gain a deeper understanding of the system or the issue, facilitating the design of effective interventions. However, many interviewees stressed the ongoing importance of learning throughout the process, encompassing both the initial understanding of the system and the learning from the portfolio of interventions, allowing for adjustments and course corrections. One interviewee mentioned that they have dedicated a separate phase to learning within their methodology, emphasizing that learning is not confined to that phase alone.

One interviewee described their approach to learning as a means of dealing with complexity:

> *“we're trying to foster an approach that says you can only learn your way into complexity” (INT-9)*

Some interviewees described the role of learning as the essence of systemic design. For example, one participant described how systemic design is not about solving technical challenges, but about co-creating processes and learning from them.

> *”It's not just about solving climate change, it's about the journey that we're taking and what kind of world we are cocreating in this process and what are we learning from it. Because again, climate change is one of those wicked challenges of our times. Like even if we solve like the technical aspect of it,*

> *we still have huge polarization of societies, distribution of resources [--].” (INT-8)*

The concept of sensemaking was closely intertwined with learning. Sensemaking was portrayed as a tool or method to learn about the system and, for example, actors in the system or a portfolio (interventions in a portfolio).

> *”But in a nutshell, the idea in this specific context of this methodology that we're using is that sensemaking is enabling information flow between different projects within the portfolio. Facilitates knowledge exchange and also is helping us sort of course correct” (INT-8)*

> *“After some implementation of those interventions, in these leverage points, we capture learnings and in those where we capture the learnings, we usually apply sensemaking as a mechanism to understand what has happened and then we adapt the portfolio, the interventions, the understanding again.” (INT-7)*

Sensemaking is often conducted through workshops, with sensemaking workshops often scheduled at the outset of the process and following interventions to capture learnings and apply sensemaking to understand what has happened.

Visualization

Visualization played an important role in the practice of systemic design for many interviewees. It was regarded as a powerful way of making invisible things visible and for effectively communicating complex issues.

> *“I think what one of the key methodologies is then to start and visualize that for people. So, at every step of the of our process visualizations plays a really important role.”* (INT-9)

One interviewee talked specifically about pedagogical visualization and pedagogical communication:

> *“Visualization and kind of pedagogical communication – it doesn't have to be pretty or have the most advanced images but rather, it's about making things visible.”*[10] *(INT-4)*

[10] Translated from Finnish into English

However, while visualization was recognized as a means to grasp complexity, it also came with a caveat. Visualizations intended to enhance the understanding of complexity can sometimes become overwhelming. One interviewee provided an insightful perspective on the balance between complexity and simplification in systemic design and especially in terms of visualization:

> *"One of the core techniques is to not do those system maps where you have like 10,000 things and you can't see anything at all, but actually start to abstract away from that. [--] we try to simplify so that people can work better with complexity, I think because complexity means it's just a lot of elements and they're all interconnected. And you need to start to be comfortable with extrapolating a little bit away from a lot of the things so that you can take decisions, so you can take next steps. Because otherwise, you get stuck in the details very quickly." (INT-9)*

Role of a Designer

During the interviews, the role of a designer in systemic design was discussed. Interviewees clarified that the term 'designer' did not necessarily refer to someone with a formal design education but rather to anyone taking on the role of working in systemic design. How the role of a designer was perceived varied and depended on the interviewee's overall view of systemic design.

At a minimum, designing in this context involved determining whether a process was an individual endeavor or a collaborative effort with others. It was also seen that it's the duty of the designer to remind others about the bigger picture, systems thinking, and how the problem or the issue is related to society at large. However, in general, it was seen that a substantial part of the work involved bringing people together, facilitating discussions, creating visual representations to make the invisible aspects visible, and establishing the conditions for change. Especially the facilitation and bringing people together was seen as an important task:

> *"So basically we're not trying to build a specific expertise, but through the participatory spaces, we're bringing different perspectives in and different stakeholders, whether it is public privates, activists, civic bodies, civil society etc. to create a more clear picture of how reality actually looks like. And from there start generating different interventions in the system." (INT-8)*

Systemic design is also a lot about rewiring, as one interviewee described the work of changing people's ways of working – moving away from product-centricity to system-centricity requires a totally different approach.

> *”And that's actually really important that rewiring work [--] Like it's nice to have those products and everything, but there's some fundamentally different ways of working together across systems and across organizations.”* (INT-9)

Another interviewee described the rewiring work as follows:

> *“[--]practical work involves a lot of facilitation and such, sparking insights or creatively creating frameworks for [individual change] …it has been so much about that first step.. to question that things can be developed in different ways.”* [11]*(INT-4)*

This interviewee continued and reflected on how a big part of the work is also about creating structures and settings for a change happening both inside and outside of an organization.

> *“[--] changing those structures internally and then externally with the operational field, so it's easier to implement there. Maybe those new methods can be a bit like played and tested there and when we're in the actual doing, or between organizations, it indeed creates that structure for discussion or provocation, so we can start seeing those invisible layers in the background.”* [12] *(INT-4)*

Furthermore, interviewees acknowledged the coordination work that was often part of the role and some mentioned that systemic designers easily become project managers when they end up coordinating and “pulling” the team together and forward.

Another perspective on the role of the designer was focused specifically on facilitation. An interviewee discussed the neutrality paradigm, saying how designers are typically seen as neutral facilitators. However, they argued that this approach is inadequate in systemic design, as designers always play a role:

> *”I think there's something with design that it is stuck in that neutrality paradigm. Designers want to be neutral, such as facilitators, right? If [--] go to any facilitation course, everyone will tell you we need to be content neutral and you're there to help the group make sense and do things but you're not allowed to bring that in. But I think that's not true. We cannot work like that. The designer and the sensemaking that a designer is able to do always play a role. There's always an interplay and the way that you make sense of it*

[11] Translated from Finnish into English
[12] Translated from Finnish into English

> *allows other people to make sense of it as well And I think it's the responsibility of a designer in that field to actually help people." (INT-9)*

4.3 Challenges of Systemic Design

This part of the chapter introduced six challenges of systemic design that emerged from the interviews. Interviewees discussed a variety of challenges of systemic design that were divided into challenges faced within an organization and outside the organization.

Disparities between Organizational and Systemic Interests

Throughout the interviews, a recurring issue that emerged was the disparity between an organizational interest and a systemic interest and how they are often misaligned causing difficulty in achieving long-term systemic goals. Interviewees provided several examples to illustrate this challenge. For instance, some organizations found themselves unable to intervene in systemic problems because they fell outside their mandate or scope of work:

> *"Like in the system, there are leverages that companies cannot intervene because it's outside their mandate or their work description" (INT-11)*

Some interviewees expressed the difficulties of aligning work on systemic issues with the organization's goal, and in some cases, it was even perceived as a threat to the organization's existence:

> *"For all agencies, or if there's an interest group, there's still their own agenda in the background of what they want to push forward, so maybe there could be challenges in coordinating them."[13] (INT-3)*

> *"So, from the [organization]'s perspective, because we've been tasked with [x], [organization]'s resources, from [organization]'s point of view, are seen in a way that we can't participate in societal development if it threatens our core mission."[14] (INT-1)*

These challenges often centered around the mandate of the organization or a specific unit within it. Systemic issues, by their nature, exceed the boundaries of any single organization or unit, leading to questions about the implications for their unit or organizations. One interviewee reflects on this issue from the point of view of an innovation unit aiming at working more with systemic issues:

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[13] Translated from Finnish into English
[14] Translated from Finnish into English

> *The task at hand is much bigger. And the really interesting question for innovation units is, can you master the organizational will to tackle some of its really deep things which means a different type of mandate." (INT-5)*

Another interviewee also reflected on how working on systemic issues quickly became a fundamental issue related to the mandate. It raises questions about whether to aim for a truly systemic change, potentially requiring changes, for example, in legislation, or more incremental changes that wouldn't threaten the organization's or unit's mandate:

> *"But then we quickly come to the point of what the current demand or mandate is. Are we considering, for example, our strategic role, and how we operate? Should we, for instance, influence our actions through legislation, then we might start to think more about systemic change, about what could be done differently in terms of legislation or agency collaboration. Or we might focus more on incremental short-term solutions or identify certain things that could be done. So, we're trying to find the right level, whether we're addressing the problem at a systemic level or aiming for some incremental small improvement from our perspective. So, it should be a conscious reflection and examination in some way."*[15] *(INT-6)*

Siloes

Another recurring challenge emphasized by interviewees was the issue of silos, which were discussed on three different levels: within organizations, between organizations within a system, and between interconnected systems, such as the food system or transport system. While the interviewees mainly discussed the first two levels, many acknowledged that in systemic design, it's difficult to view even a single system in isolation due to their interconnections.

One interviewee described the organizational siloes as follows:

> *"And sometimes this happens within one organization let's say customer experience team versus I don't know waste management team doesn't kind of talk and or their agendas and priorities are different." (INT-11)*

Another interviewee, approaching systemic design from an end-user perspective, noted the challenge of problem identification being influenced by organizational structures and processes rather than truly the problem or the customer:

[15] Translated from Finnish into English

> *"So, when we identify a problem, unfortunately, it's often approached in a way that the problem area is bounded by competencies, systems, and processes. And this is evident in our framework in such a way that it often doesn't start from the customer; the identified problem is related to some system or challenge identified by the administration"*[16] *(INT-1)*

In general, silos were perceived as hindrances to various aspects, including problem identification, information flow, and effective collaboration. One interviewee explained how interactions between actors in the system might exist, but silos restrict further information and resource flows:

> *"[--]very rigid organizational boundaries [--] this is one organization and this comprises of the specific people within that organization, and that's it. And then we have those different bubbles and they kind of interact with each other. But there's not much kind of fluidity in between which prevents first information flows but also resource flows to flow more freely in the whole ecosystem." (INT-8)*

Collaboration

Collaboration emerged as a significant challenge both institutionally and individually during the interviews. Interviewees discussed the inherent difficulty of collaboration, which requires a particular mindset, and skills and will not always be supported by the prevailing environment. One interviewee pointed out how just talking about being more collaborative and working better together doesn't provide results:

> *"What they were used to is to bring people in a room and say we need to work better together and you know, the environment needs to talk to governance and health and [--] and the result of this was typically the people just went out with even more siloed because a dynamic just doesn't work, right? Just putting people together in a room and say we need to take a systemic approach just doesn't work. It's a recipe for disaster." (INT-5)*

As previously mentioned, organizations tend to prioritize their own interests rather than considering the broader systemic benefits, which doesn't necessarily foster deep collaboration. Additionally, individuals and organizations often prioritize efficiency, while collaboration is perceived as more time-consuming, and, therefore, not the preferred choice.

[16] Translated from Finnish into English

One interviewee provided a vivid analogy by comparing collaboration to traveling alone versus in a group.

> *"I always use this travel analogy: if you go on a trip with a large group, it's like going from point A to point B when one wants to go to the bar, one wants to go shopping, one wants to exercise in the morning, and one wants to sleep in. So the day progresses much slower, [--] But if we go with our own group, it happens very smoothly, so there's a bit of the same thinking in government development: it would be nice to go on a trip as a group, but if we just quietly go on our own and make our own decisions and focus on our own things, we can achieve the goal and then tell the guiding ministry, 'We're done, and it works'."*[17] *(INT-2)*

Another interviewee highlighted how collaboration often leads to increased administration, making projects heavier and, consequently, often limiting them to internal projects:

> *"development projects are easily restricted within our own walls because collaborative efforts often turn into heavy project administration and bureaucracy, and it takes six months or a year before steering committees are established, etc."*[18] *(INT-6)*

Some interviewees also emphasized that collaboration is challenging, not just for organizations but also for individuals:

> *"One of the biggest challenges is actually for the participants to engage in collaborative practices. It's so hard like, I don't know, somewhere deep in our subconsciousness, people are not ready to actually collaborate. They don't know how to collaborate. People are afraid to voice out their opinions and thoughts, and everybody is afraid to say something wrong or be judged or be perceived in a different way." (INT-8)*

The difficulties in collaboration weren't limited to inter-organizational challenges. Interviewees also pointed out how engaging or collaborating with individuals who are experiencing the issues being addressed (e.g., customers) can be exceedingly challenging:

> *"There's this kind of expert... sort of expert administration where experts have ownership of a certain area for years from the starting point, but also, there's no obligation for them to know what's happening in the field among*

[17] Translated from Finnish into English
[18] Translated from Finnish into English

> *certain customer groups. It's rather static; the administrative structure doesn't have a low threshold for engaging those customers"*[19] *(INT-1)*

Demonstrating Impact

Demonstrating impact emerged as a significant challenge in the realm of systemic design. This challenge is multifaceted, beginning with the fundamental distinction between showcasing the impact of tangible outcomes, such as products, which is relatively easier, compared to demonstrating the broader, more complex changes that systemic design seeks to facilitate, even when those changes themselves can be tangible in nature. As one interviewee explained:

> *"[--] it's not the portfolio and not the new product that you have that will make the impact. But it's, it is actually the new constellations that you enable through that new constellations with let's say local organizations, with industry, with policymakers, with research. And it's those connections that you make happen through these experiences that will ultimately, you know, matter because they are rewiring that system and they are rewiring those who have the capabilities and the resources in innovative ways." (INT-9)*

The challenge lies in conveying this systemic rewiring, especially when conventional impact measures, such as Key Performance Indicators (KPIs), predominantly focus on output-level accomplishments.

> *"Because one of the biggest issues for us is that we're really bad at telling stories of how change happens. And so, we're very good at telling output level achievements but when you talk about outcome level change, it's often a weak spot." (INT-10)*

Furthermore, organizations often demand evidence of impact at the individual (organizational) level, while systemic change operates from a different angle. Measuring the collective impact of numerous organizations is a complicated task and calculating the benefits gained by multiple organizations is complex.

This challenge is closely tied to a fundamental attribute of systemic design: its extended time frame. Systemic design operates within longer time horizons, necessitating patience when awaiting results – a quality often lacking within organizations:

[19] Translated from Finnish into English

> *"Often, the management has an expectation for that kind of magical solution that brings us huge benefits. When allocating resources the management also has to trust that it's like seeking a long-term benefit through that."*[20] *(INT-2)*

For systemic designers, this often translates into the need to creatively convey narratives of change:

> *"It also requires playing by the rules of the system so that you can then somehow quantify those, those soft values or not soft but rather changes that won't be so straightforward, quantify them somehow. But it's a lot of communication that just creates peace for that work and then for making the change"*[21] *(INT-4)*

Organizational Change

Systemic design necessitates organizational change as introducing any other new initiative or way of working within an organization. The challenges reported in this regard included the need for mindset shifts, resistance to change, and a reluctance to take risks. However, what sets systemic change apart from many other new approaches introduced is its requirements for comprehensive organizational transformation. To illustrate, one interviewee drew a parallel with the digitalization of an organization, emphasizing that systemic change touches every facet of the organization and cannot be accomplished by a dedicated unit in isolation.

> *"I think in a sense it's not that different from digital units that started as you know, digitizing, you know, paper processes. And then all of a sudden you know very quickly realized that actually if you want to make an organization that thinks digitally first, you need to overhaul the whole organization and that requires getting a different type of mandate" (INT-5)*

Particularly among those interviewees working in-house, the topic of organizational change was a noticeable focus. In practice, a significant portion of their efforts involved change management, creating incentives for organizational transformation, which is crucial for facilitating systems change and must progress in parallel with other initiatives.

> *"There are things that we're also doing that seem very mundane or boring, but you know are really relevant from an organizational change perspective because it's all about creating incentives, right? How do you actually create*

[20] Translated from Finnish into English
[21] Translated from Finnish into English

> *the right incentives in the organization to do this type of work? So, it's a lot of change management except nobody wants to say it out loud." (INT-10)*

This effort included a lot of work with various units within the organization, such as human resources and procurement, a process that frequently caused questioning, suspicion, and sometimes even resistance. Some of this resistance was caused by concerns related to the mandate, as discussed earlier in this chapter. An interviewee shared a telling example:

> *Why are you doing this? You are an innovation unit. You're supposed to give us blockchain and generative AI and all these other things. And here you are talking about changing procurement, HR, etc. Who are you to even start this conversation? Who do you think you are, right? And so, it's been a very difficult negotiating process." (INT-5)*

Resistance to change was also explored in terms of individuals within organizations resisting change efforts. It was acknowledged that resistance is an inherent aspect of this work, whether desired or not, and that finding strategies to collaborate with resistance is essential.

> *"Yeah, some are more inclined toward pushing forward with disruptive actions. But then they always encounter the same conservative and cautious type who says it's not the right time, and we've just implemented such a reform, and this is problematic because some marginal groups won't benefit from it anyway."*[22] *(INT-1)*

> *"And probably, you know, factoring in resistance, no one factors in resistance in their project plans. That's probably the thing that takes most of the time is actually to get to work with that resistance and get past that resistance, you know, and sometimes you don't get past it. But you will find a way to work with it at least still." (INT-9)*

Holistic Approach, Holistic Challenges

In general, systemic design is often seen as a holistic approach, and this holistic nature also extends to the challenges faced in systemic design work. One of the most profound challenges highlighted by some interviewees is the combination of creating something new while still tackling the constraints of the existing system.

These constraints from the old, the current system can be manifested in the form of a mindset geared towards emphasizing outputs and delivery, rather than fostering an

[22] Translated from Finnish into English

environment conducive to learning and experimentation, which is considered a fundamental component of systemic design. Another interviewee shed light on this aspect, saying,

> *"And when you're trying to create a space for learning and experimenting and trying and working on a process that is something doing something new, right with people that you don't work with usually you know this takes a lot of time and it takes a lot of mental space and kind of bandwidth that is very difficult to create in an environment where everything is basically incentivized by delivery." (INT-10)*

This is linked with financial models that often fail to support systemic work. Addressing systemic issues necessitates adopting a new perspective to understand the underlying problems, rather than fixating on predetermined outcomes. However, the current financial models don't often support this kind of approach. An interviewee illustrated this by stating,

> *"Perhaps the funding model is also somewhat of a challenge in that it's not based on, like, achieving a certain outcome, because to address systemic or ecosystem issues, it's necessary to accept that we don't start from an agreed-upon end result, but rather we start by exploring the problem, and the possible solution emerges along the way.* [23] *(INT-2)*

Moreover, systemic design has a set of unique challenges by being a novel approach. While practitioners aim to create something new, they concurrently find themselves in the position of shaping the field itself. This role requires considering sometimes even things that may feel small but have a bigger impact. One interviewee reflected on their experiences as follows:

> *"We made some of the usual mistakes. We started using lots of jargon and the system stuff is unfortunately full of it [--] alienated quite a lot of people. It's still by and large framed often very much as with the Western perspective, so it really does not resonate in many contexts. And you know, there's always the danger, you know, portfolio and systems become a new design thinking, right? So it's like yet another magic thing [--] to solve all the problems, right?" (INT-5)*

Lastly, it's essential to acknowledge the inherent difficulty in bringing about change, a challenge that extends to both institutional and individual contexts. This difficulty is articulated by one interviewee:

[23] Translated from Finnish into English

> *“One of the biggest problems I think is that making daring commitments is very difficult and change is just difficult. That's actually one of our biggest problems. We don't really know how to deal with change institutionally and individually.” (INT-9)*

5 The Path to Systemic Design in Organizations

In this chapter, a synthesis of the interview results and the literature review is presented in order to create a path to systemic design in organizations. It includes four distinct elements.

The first element, the exploration of systemic design perspectives is intended to clarify the concept of systemic design itself and provide an understanding of what a systemic design approach/perspective can look like. This is largely derived from the different perceptions of systemic design introduced in Chapter 4.1. The second element, the incorporation of a systemic design framework aims to present a more holistic picture of systemic design, focusing particularly on how to engage in systemic design and the essential requisites involved. Insights from the interviews, including discussions on methodologies, key considerations in systemic design, challenges encountered, and the organizational role, inform this section. Both of these elements are important aspects when we are talking about systemic design in organizations. In order to enhance systemic design in an organization, it is important to build up an organization’s understanding of what systemic design is, why and when it is used, and what the approach could look like (Kaur, 2021).

The third element, the inclusion of a systemic design maturity model seeks to provide a structured way to assess the organization’s position in the spectrum and contribute to a nuanced understanding of the implications associated with systemic design within the organizational context. Drawing primarily from existing literature on other maturity models, with insights from the interviews as its foundation, it seeks to be a practical tool to assist organizations in initiating their systemic design journey. The fourth element, the matrix aims to visually present how different systemic design perspectives require varying levels of organizational maturity to be effectively implemented.

By combining these four elements, this chapter aims to provide an insightful package that not only helps to understand what systemic design is but also offers practical information for organizations seeking to implement systemic design approaches.

5.1 Systemic Design Perspectives

As observed in the literature review, systemic design is a term often used with varying interpretations with not one universal definition. One common definition characterizes it as a

combination of systems thinking/approaches and design thinking/approaches (e.g. Sevaldson and Jones, 2019; Jones and Van Ael, 2022; van der Bijl-Brouwer, 2023). However, these definitions of systemic design still leave room for various interpretations of what it actually means. The empirical findings of this study echoed the diversity of perspectives on systemic design. Synthesizing these results, six distinct perspectives on systemic design emerged. These six perspectives to comprehending systemic design are proposed to contribute to the ongoing efforts aiming at a deeper understanding of the concept.

Perspective 1: Systemic design as designing a product or service with a wider system in mind

In this approach, the systemic design is seen as a consideration of a broader system. Designers recognize that products exist within broader systems and environments (Buchanan, 2019). When designing a product or service, it involves a comprehensive understanding that the implications extend beyond the immediate scope of the design. It considers the effects on communities, society, the economy, and the environment, taking them into consideration (van der Bijl-Brouwer, 2023). See Figure 11.

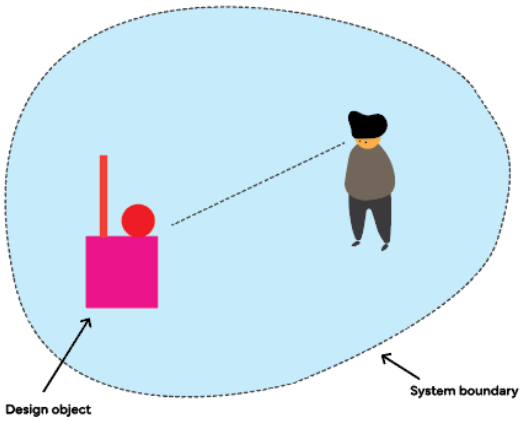


Figure 11: Systemic design as designing a product or service with a wider system in mind

Perspective 2: Systemic design as designing around customer-focused life events

In this approach, the customer's journey and life events take center stage. Life events are events that require individuals to engage with services offered by multiple government authorities. An example of a life event would be the birth of a child, getting married, or the death of a family member. Creating services around the life events and experiences of users is especially interesting for governments in their attempts to provide public services, especially in the field of eGovernment where life events were first introduced (Gros, 2020). Therefore, designing around life events is strongly linked to digitalization and designing digital services. Life events are seen as pivotal opportunities to foster collaboration among

different institutions, all working cohesively towards a shared objective: meeting the needs of the customer. This approach emphasizes inter-agency collaboration and the exchange of information between these entities. The role of a designer is perceived as either someone who keeps sight of the broader perspective or as a facilitator in nurturing deeper collaboration. This approach is similar to Perspective 1 in a way that it often aims to create a single service within a system rather than transforming the system or creating a new system. See Figure 12.

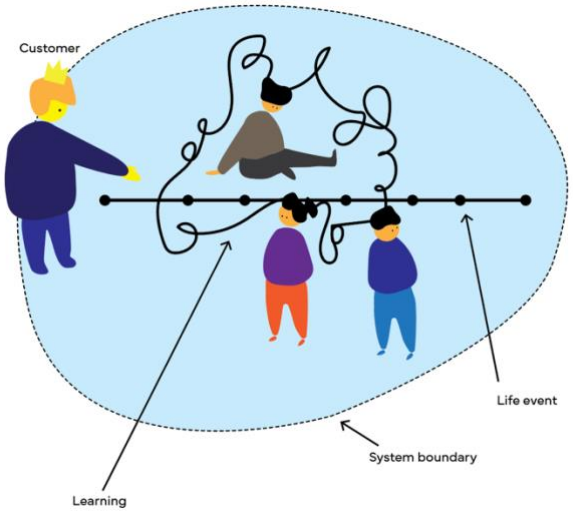


Figure 12: Systemic design as designing around customer-focused life events

Perspective 3: Systemic design as addressing complex problems

In this approach, the starting point is a complex problem that unites diverse stakeholders in their quest to seek ways to address the problem. It emphasizes the significance of identifying the root cause(s) of the problem rather than attempting to address superficial symptoms (van der Bijl-Brouwer, 2023). As designers delve deeper into understanding these complex issues, they inevitably encounter the systemic nature of the challenge. These kinds of problems are often wicked problems, problems related to sustainability, such as climate change or environmental degradation, or societal problems, such as poverty. This approach can align with Perspective 4: Systemic design as a portfolio of interventions by, for example, having a complex problem as a starting point and moving on to a portfolio of interventions to understand the problem space. It can also align with Perspective 2: Systemic design as designing around customer-focused life events. See Figure 13.

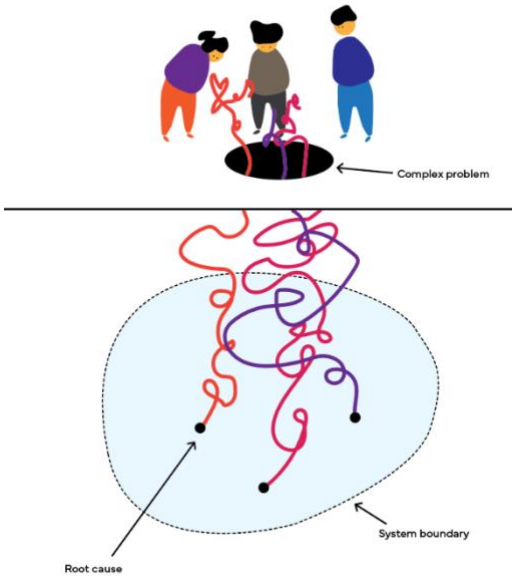


Figure 13: Systemic design as addressing complex problems

Perspective 4: Systemic design as a portfolio of interventions

This approach focuses on achieving systemic change through the implementation of multiple interventions that draw learnings from one another. Typically, it commences with either addressing a complex problem or building upon the existing portfolio of projects. "*The portfolio is a platform for strategic learning and action: to understand the dynamics that occupy the problem space, and over time more accurately understand the aligned interventions.*" (UNDP, 2022 p. 3). It encourages collaboration among diverse system stakeholders or as UNDP (2022) calls it, it is a communal process that invites different stakeholders into the design process itself. The ultimate objective is a transformative shift across the entire system. See Figure 14.

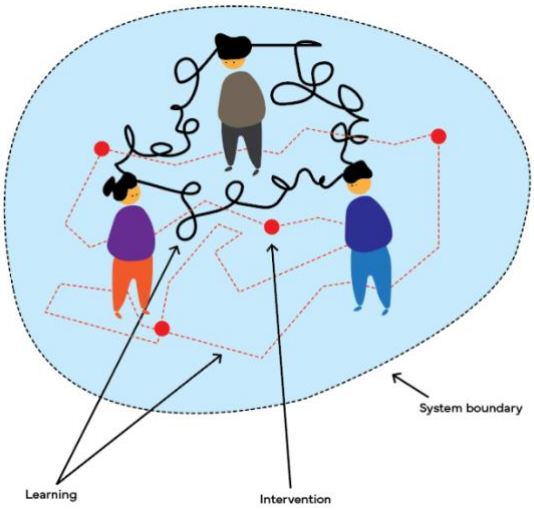


Figure 14: Systemic design as a portfolio of interventions

Perspective 5: Systemic design as novelty emerging from interconnectedness

This approach places a strong emphasis on novelty and innovation. The starting point does not necessarily revolve around an existing problem; rather, the thinking aims to start and remain at the systemic level rather than being problem-centric. It is asking what is the system to be changed rather than what is the problem to be changed. The focus lies in understanding the interrelationships and interconnectedness within the system, with innovations viewed as emerging from these connections. To achieve that, one must move away from problem-solving and influence the system instead (Dorst, 2019). See Figure 15.

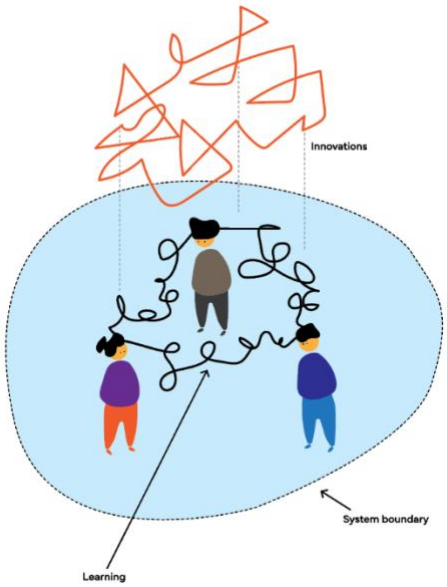


Figure 15: Systemic design as novelty emerging from interconnectedness

Perspective 6: Systemic design as in-between systems

This approach highlights the significance of independent actors who operate without being constrained by the current system's limitations. Established institutions are often bound by specific requirements and agendas tied to the existing system. Consequently, acting independently offers a chance to operate in a sort of in-between space within society, business, and the public sector, filling gaps that may otherwise remain unaddressed. See Figure 16.

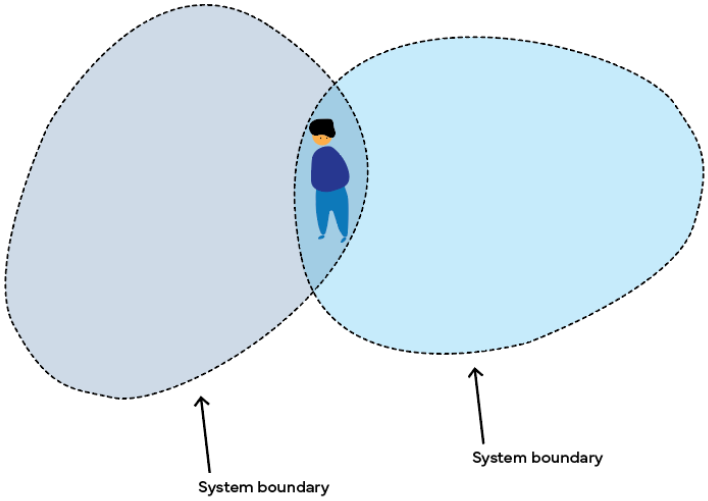


Figure 16: Systemic design as in-between systems

As mentioned earlier, there are multiple ways of understanding what systemic design means. There are differences regarding how you attempt to make the change (e.g. different starting points for the change) as well as how much of change you attempt to make (e.g. incremental change vs. transformational change). These six proposed perspectives mostly address the first one (how to make the change) while for example, the 'system-conscious design' and 'system-shifting design' proposed by Drew et al. (2021) might be more suitable for categorizing the second one (how much of the change). Some of the presented perspectives may be more inclined to call designers to only consider the context of the whole system rather than redesigning a whole system (Kaur, 2021). However, even with aiming at transformation, it might be difficult to say whether the change is considered a system shift/transformation or not and different interpretations exist. Also, the proposed perspectives are not necessarily mutually exclusive. The definition of systemic design leaves much room for interpretation on the kinds of change concerned.

Moreover, it's not always straightforward what level of design is a designer working on. According to Figure 3, 'Boundaries of the Four Design Domains' by Jones and Van Ael (2022), systemic design is a domain atop of other domains, namely artefactual, products and

services, and organizational, characterized by the highest levels of complexity. However, as the proposed perspectives indicate, systemic design, or at least design perceived as systemic, also occurs in other domains. Organizational complexities (D3.0) might be confused with the complexities of the system (D4.0), which itself is not surprising as there might be changes needed at different levels. This was also observed in the interviews. However, it's essential to note that organizational change itself is not the primary goal of systemic design (Jones and Van Ael, 2022), but it rather serves as an enabler for systemic design.

Additionally, there are varying understandings regarding the role of a user depending on which perspective holds dominance. For example, interviewees primarily aligned with Perspectives 1 and 2 acknowledged a singular user within the system, while those emphasizing Perspectives 4, 5 and 6 avoided concentrating on a single user and aimed at operating at the system level. Interviewees focused on perspective 3 exhibited mixed viewpoints. Despite literature suggesting that systemic design does not focus on a single user, in practice, this often occurs. For example, designers at the Australian Taxation Office still perceived a distinction between users and other stakeholders, indicating a need for additional emphasis on connecting the users to the broader ecosystem (Kaur, 2021).

5.2 Systemic Design Framework

This framework draws inspiration from existing frameworks but primarily relies on the empirical findings of this study, i.e. the interview results. There are some systemic design frameworks found in the literature. For instance, the Systemic Design Framework by the Design Council (2021) is based on the double diamond model, and it includes six principles, four key roles, types of design activities, and enabling activities. Additionally, there is a framework proposed by Ryan (2014) and Costa Junior et al. (2019) that are both described in more detail in the literature review in Chapter 2.5. This framework is not aimed to replace the existing ones but rather to complement them.

While this framework doesn't offer a detailed, step-by-step methodology, it aims to present a comprehensive overview of systemic design, focusing particularly on how to engage in systemic design and the essential requisites involved. The framework has four layers, methodology, learning, collaboration, and organization, each of them representing a crucial element for systemic design. These are themes that emerged from the interviews. See Figure 17 for a visual illustration of the framework.

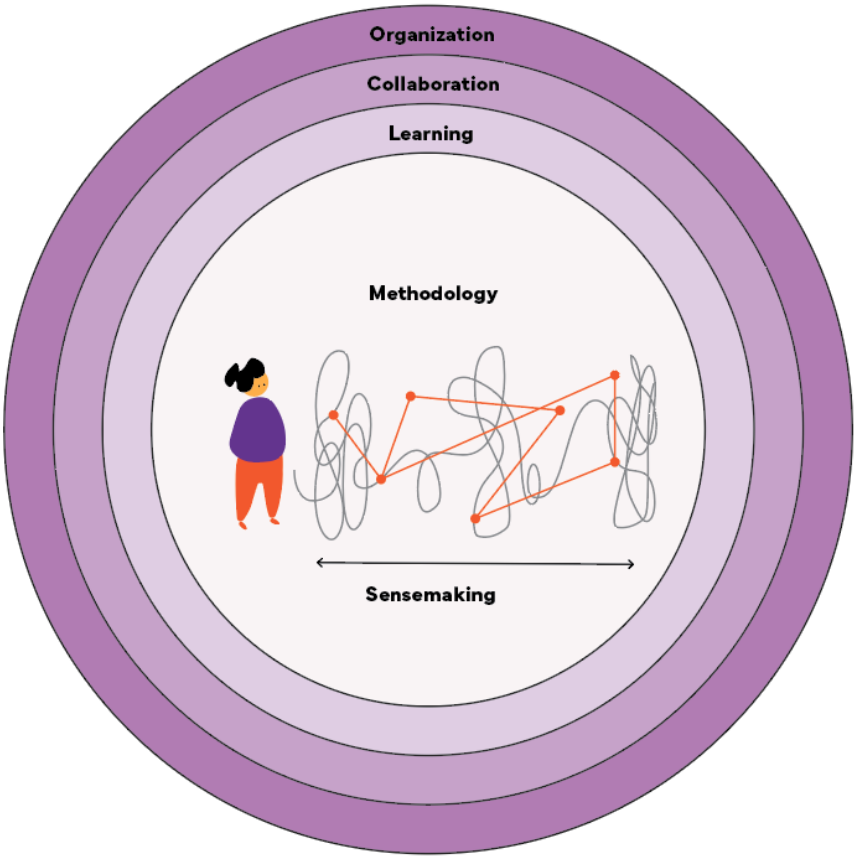


Figure 17: Systemic design framework

Methodology

Systemic design methodologies are discussed in a variety of ways both in the literature and in interviews. Systemic design experts have suggested not settling into a fixed methodology (Sevaldson and Jones, 2019), but rather using an approach based on principles (van der Bijl-Brouwer and Malcolm, 2020). This was also observed in the interviews in which participants emphasized the flexibility of the methodology used and/or didn't have a fixed methodology. Therefore, this framework doesn't propose a fixed sequence of methods from initiation to the end but rather discusses the specific characteristics of systemic design methodologies that emerged from the empirical findings.

Prevailing perspectives tend to oversimplify reality, preferring linear, single-solution approaches even for issues that demand a deeper understanding and recognition of their complexities. As seen in Chapter 4.2, regardless of the chosen methodology, the initial step involves acknowledging and visualizing the system and its inherent complexity. However, navigating through this complexity can be challenging and overwhelming. Insights from the interviews revealed that one way to manage this is to find a way to abstract complexity, making it manageable ('workable'). Without this abstraction, one risks getting stuck with the

details. Additionally, most methodologies include a phase to explore possibilities and come up with alternatives to the current reality, thus futures and foresight methods are often included. Ultimately, the objective of any selected systemic design methodology is to guide practitioners through this process. See Figure 18 for a visual illustration of the process.

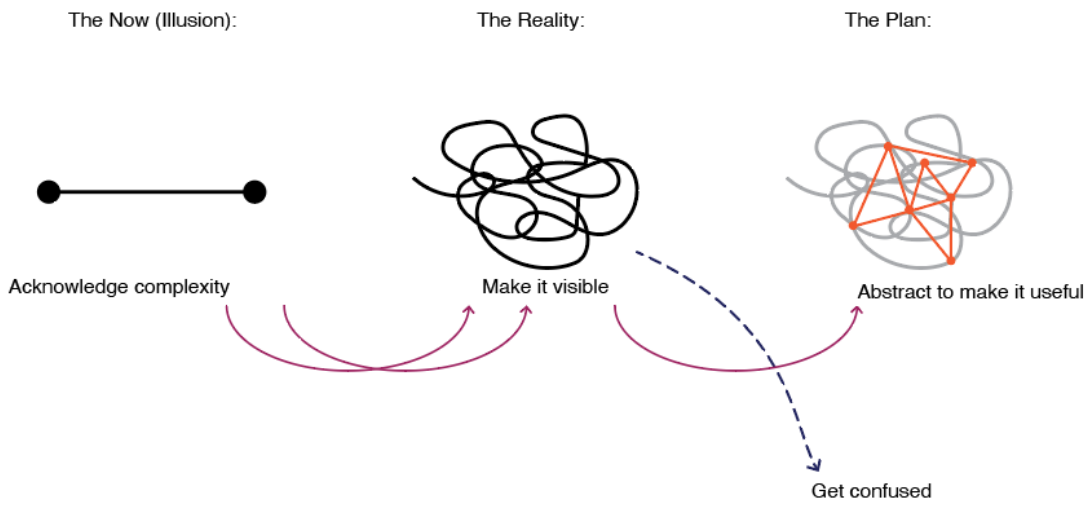


Figure 18: Systemic design methodology

When discussing methodology, it's important to address the unique role of a designer, which appears distinct. Particularly, interviewees engaged in transformative systemic change (Perspectives 4, 5 and 6) emphasized how the designer needs to be able to step away from the traditional role of a neutral facilitator. Traditionally, design has been seen as politically neutral (Vink, 2019), with designers often seen as neutral facilitators. However, when working with complex, systemic issues, there is not a singular truth that you can conclude and act upon; instead, multiple narratives exist to help make sense of the complexities, including the designer's perspective. Any methodology of systemic design requires a designer to be comfortable with never getting to know the complete picture and their own role in shaping it. This notion is supported by some existing literature, for example, Vink (2019) suggests that design is inherently political. Particularly in systemic work, designers are encouraged to take a stance and actively strive for alternative intentions rather than merely serving as neutral facilitators (Drew et al., 2021).

Another distinct element regarding systemic design methodologies is how it can be seen as embodied experience. The empirical evidence suggests that this is still a minority perspective, but two interviewees specifically talked about how systemic design should not only include cognitive techniques but embodied methods as well. There is some literature to support this view. For instance, Vink (2019) discusses the embodied nature of (service) design practice and how "*it involves insights gained through one's senses, actions, and interactions*

that happen through the movement of actors' bodies with support from physical artefacts" (Vink, 2019 p. 134).

Learning

Learning was demonstrated to be an integral and essential part of systemic design both in literature and by interviewees. As Seveldson (2022, p. 33) explains, "*complex issues are often never understood, but we might have a chance to understand them sufficiently if we dare to intervene, to learn from how the system reacts to our interventions, and continue to iterate based on those learnings*". In practice, and as the insights from the interviews reveal, learning is part of systemic design methodologies, including sensemaking, and it also refers to a learning mindset, culture and practice as well as demonstrating impact and monitoring and evaluation.

With systemic design, there's a profound recognition that we don't possess all the answers, and thus the acknowledgment of the unknown and constant learning is an integral part of systemic design. This requires a certain mindset and environment both at the individual and organizational level to do collective learning within the organization (within the team and between teams) and outside the organization with collaborators. Seppälä (2022b) discusses different scales of learning and has divided them into four: individual learning, team learning, learning organization, and learning ecosystems. In terms of systemic change, especially, the learning ecosystems play a crucial role.

Interviewees reported various challenges at different learning scales, but mostly at the individual and organizational levels. Challenges regarding the individual level referred mostly to a mindset of having all answers and also at the organizational level in which an environment does not acknowledge uncertainty. Challenges in the organizational level learning also included difficulties in integrating learning as a primary output, especially when organizations are primarily incentivized by delivery.

When the focus is more on learning rather than meeting predefined (delivery) targets, it directly influences how one demonstrates impact and monitors and evaluates progress. Evaluating systems change is a big challenge (Vester Haldrup, 2023) and an evolving field with no straightforward solutions or definite answers. This was also observed in interviews as no interviewee was at the stage who would have figured it out. Interviewees who had the most experience with (transformative) systemic change were still learning what it means to evaluate systems change and just emphasized how it should be incorporated early on in the process. UNDP (2023) advises three steps: start with the conceptual framework that makes sense for you; identify ways of measuring and tracking change in the different elements of the system; and interrogate why these changes have come about.

Collaboration

Collaboration is a crucial element of systemic design. Regardless of how one perceives systemic design, attempting it in isolation is simply unfeasible. Yet, the discourse on collaboration tends to lack specificity (Steinberg, 2020). It includes a spectrum of elements, ranging from 'knowledge sharing among collaborators' and 'the participation of stakeholders across existing system boundaries' (Jones and Van Ael, 2022) to ‘being collective’ (Drew et al. 2022), and ‘strengthening human relationships’ (van der Bijl-Brouwer and Malcolm 2020). The same was observed in the interviews, where collaboration discourse ranged from sharing information with stakeholders to shifting away from hierarchical decision-making toward collective efforts with shared power. However, often in the context of transformative systemic change, the question revolves around bringing different disciplines to the table. Rather than simply optimizing solutions, the goal is rather to foster synthesis and create new kinds of options (Steinberg, 2020). In this framework, the term ‘collaboration’ is limited in conveying the full extent of its meaning in this framework; it encompasses many crucial elements such as power dynamics, diversity, multiple perspectives, inclusion, and collective effort.

The findings suggest that power plays an important role in systemic design. The more transformational change is aimed at, the more evident the role of power becomes and especially those interviewees with more extensive experience in systems change emphasized the role of it. This is in line with the literature. According to Drew et al. (2022) designers should facilitate fundamental shifts in a system's purpose, power, relationships, and resource flows as part of driving systemic transition. Some interviewees, for example, discussed the implications for an organization in scenarios involving shared power, which could result in the organization losing some of its power – how it affects the organization and its actions and position within the system. The issue of power is not to be ignored by those either who are not necessarily aiming at a total transformation of the system, but rather designing with the system in mind. Kähkönen (2014) argues that power imbalance may prevent intensive collaboration as the actor in a dominant position may not be willing to form collaborative relationships with other actors or avoid intensive collaboration.

Based on the empirical findings of this study, it can be said that the challenges of collaboration manifest at various levels, including the individual (where people may lack the necessary collaboration skills or work in environments that do not support collaboration), within organizations (often characterized by silos), and within ecosystems (where organizations might struggle with collaboration or prioritize their individual interests over broader systems benefits). Interviewees discussed all these types of challenges in the interviews. Designing collaborative efforts to effect system change is a reflective process that demands changes in organizational structures, mindsets, and individual behavior.

Catalyst2030 (2022) proposes three fundamental principles for effective systems-change collaboration: cultivating a collective identity, considering the context, and reconfiguring power dynamics.

Organization

By default, systemic design is holistic and interdisciplinary, and it inherently involves a transformation that touches upon various aspects of an organization. There is limited research on organizational aspects of systemic design in the literature, yet the findings of this study show how these aspects can either serve as significant facilitators or obstacles to systemic design. For example, as shown in Chapter 4.3, interviewees discussed extensively the challenges associated with systemic design, expressing concerns primarily about organizational limitations in supporting systemic efforts and even hindering such attempts.

Empirical findings suggest that certain organizational aspects are necessary for success in systemic design. It is crucial to involve senior managers. Systemic design is a collaborative effort that, by nature, impacts different facets of the organization. Therefore, securing buy-in from the upper level of the organizational hierarchy is essential. This was emphasized by several interviewers. The risk of failure significantly increases if they are not engaged. The literature confirms this viewpoint. For example, Bailey (2012) argues that for an organization to acknowledge the usefulness of design, it requires vision and support from top-level management. The organization must recognize the need to adopt a design approach and implement the factors that will allow it to happen.

Even though the involvement and support from the top-level management are crucial it is not always enough. The insights from interviews revealed that additionally, it is essential to recognize that power is not always concentrated solely at the upper levels of the organizational hierarchy. Instead, it can be distributed across various sectors within the organization, such as specific functional units, or even external entities like donors. Identifying those entities who hold significant power and gathering their support, or at least a critical mass of it, is a fundamental strategy.

Several studies are focusing on embedding design capabilities in large organizations (Ulloa, 2020). For example, Bailey (2012) discusses how building the service design capability throughout the organization is important, enabling them all to move forward together. Similarly, Kaur (2021) emphasizes the importance of ensuring continuous capability and knowledge-building mechanisms to enhance systemic design within organizations. Empirical insights align with existing literature, as several interviewees stressed the importance of involving others and dedicating a part of their work to the capacity building of others.

Essentially this layer of the framework has various elements that are common in any organizational transformation including leadership support, communication, stakeholder engagement, change planning, capability building, etc. although truly integrating systemic design into an organization can be more complex than other organizational transformation efforts. What makes the systemic design more complex is its extension beyond the organization's boundaries, such as system-wide benefits versus organizational benefits and navigating the inherent uncertainty associated with systemic design. While some studies suggest that design transformation could be combined with other ongoing transformation initiatives of the organization, such as digitalization (Björklund et al., 2020), it is unclear whether this would be the case with systemic design.

5.3 Systemic Design Maturity Model

The current literature on incorporating systemic design into (public) organizations is limited, with much of it restricted to academic and theoretical discussions (Kaur, 2021). This maturity model has been developed to provide a more tangible contribution to this discourse.

Inspired by the Design Ladder introduced by the Danish Design Centre (Dansk Design Center, 2015; OP, 2020), this model is a synthesis of empirical findings and existing literature. Additionally, it draws inspiration and guidance from various maturity models, including an extended version of the Design Ladder (Hoedemaeckers, 2016), the Co-Design Maturity model (Blomkamp, 2022), and the Organizational Maturity Model for EX&CX Centric Organization (Liu, 2023).

The model has five stages in which each stage represents a phase in the organization's engagement with systemic work. The model presents the journey, from the initial total absence of systemic awareness to a profound systemic transformation. While it is not an assessment tool, it should help to reflect the organization's position in the spectrum and thus, foster a more nuanced understanding of systemic design's implications and potential transformations within the organizational context. See Figure 19 for a visual illustration of the systemic design maturity model.

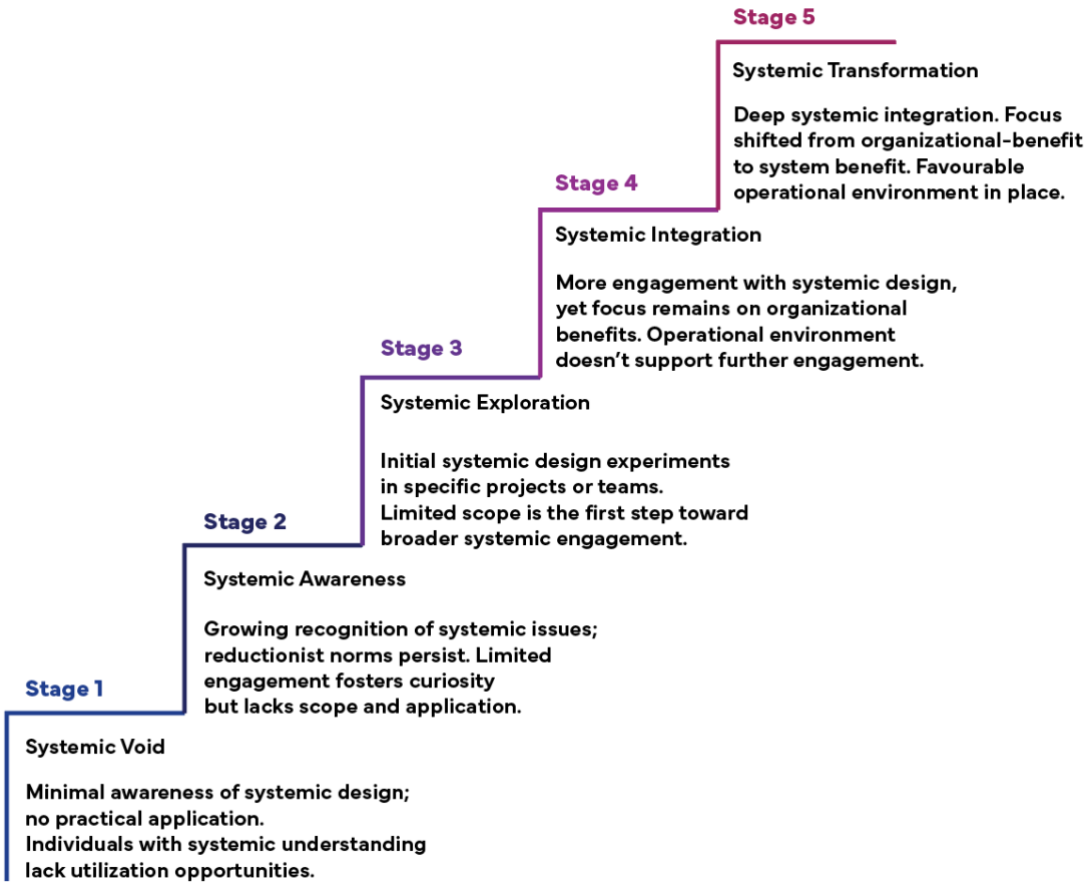


Figure 19: Systemic design maturity model

Stage 1: Systemic Void

Systemic work is entirely absent from the organization's discourse and operations. The organization does not recognize systemic design as a part of its operations. While there might be individuals within the organization having a systemic understanding, their insights are not utilized and opportunities to apply systemic design even at the level of exploration are nonexistent.

A designer in this context would typically try to bring more systemic elements to their own work.

Stage 2: Systemic Awareness

The organization is at the initial stage of engaging with systemic design. There is a partial recognition that certain problems or issues show systemic characteristics and existing approaches are not enough to address them. There is a curiosity about delving into systemic design, but systemic perspective plays little role in the process. The prevailing norm within

the organization is reductionist, and while there might be attempts to seek external contributions the tendency is to work in isolation. The application of systemic design in actual projects or processes is limited. The key aspect of systemic design, learning, primarily occurs at the individual level (Seppälä, 2022b).

In this context, a designer would typically try to infuse more systemic elements into their own work and areas under their influence. Simultaneously, they would seek to raise awareness about the systemic nature of issues within a broader scope of the organization. Extending the focus of learning beyond the individual level, specifically aiming for team-level learning, can help in introducing systemic thinking to the organization.

Stage 3: Systemic Exploration

The organization is in a phase of initial experimentation with systemic design. This involves conducting exploratory efforts in certain projects or processes. While there is a level of engagement with systemic design methods, this exploration is still limited in scope, often confined to specific projects. Systemic design practices may be concentrated within a specific unit or team, such as the organization's innovation team. Consequently, systemic design is mostly practiced by a limited number of people in the organization.

The key aspect of systemic design, learning, primarily occurs within a team (Seppälä, 2022b) where experimentation is taking place. In this stage there's a shift from curiosity to active exploration, but within a restricted space.

In this context, a designer would typically try to incorporate more systemic elements into both their individual work and the collaborative efforts of their team. It would also include active engagement with other teams within the organization, requiring a substantial amount of influencing type of work. Trying to extend learning from the team level to the organizational level, i.e. teams learning from other teams and potentially from other actors in the ecosystem as well would support moving to another stage of systemic design.

Stage 4: Systemic Integration

There are more people interested in and practicing systemic design and systemic design is integrated into a larger part of the organization. It has become a more integral part of approaches to projects and problem-solving in general and systemic design principles and methodologies are applied more systematically when deemed appropriate. There is cross-functional collaboration, and no significant barriers are impeding collaboration across different departments. There is also collaboration with other actors in the ecosystem, but the organization and its benefits stay at the center of the focus. The organization has not yet been able to shift its thinking from organizational benefits to systems benefits, i.e. focus on

the interests of the entire system and considering how decisions affect the system as a whole. The systemic level work is also considered challenging because the operating environment does not support it, so the organization is stuck between the current restrictions and its interest in doing more systemic work.

The key aspect of systemic design, learning, extends beyond individual teams, fostering learning between teams within the organization (Seppälä, 2022b).

In this context, a designer would focus on influencing decision-makers within the organization and the broader ecosystem. Since the work is still relatively organizational focused, trying to extend the learning more widely to the ecosystem, i.e. learning happening through co-creation, can help systemic work in general as well as influencing the organization itself.

Stage 5: Systemic Transformation

There is a profound integration of systemic design into the organization's core. The organization operates with a systemic mindset, having undergone a transformative process that embeds systemic and design practices throughout its operations. This transformation most likely has influenced the organization's strategy, enabling it to adopt a systemic perspective and move away from a solely organizational-focused approach. At this stage, the focus has moved away from the organizations to the ecosystem.

The key aspect of systemic design, learning, occurs at the ecosystem level (Seppälä, 2022b). The transformation at this stage revolves around how to facilitate collective learning within the entire ecosystem, and how one's organization learns and co-evolves alongside it.

To reach this level, an enabling environment for system-level working must be in place. This includes elements such as a financing model and policies that enable and support systems-level thinking and operations.

A designer in this context would typically be a thought leader in the field and support others in their efforts in systemic design. The primary emphasis of their work would lie on the ecosystem level.

5.4 Matrix of Organizational Maturity and Systemic Design Perspectives

Different systemic design perspectives require different levels of organizational maturity. For instance, designing a product/service and simply keeping a wider system in mind (Perspective 1) may not disrupt an organization's existing way of operating, whereas aiming for novelty emerging from the interconnectedness and interrelationships of the system (Perspective 5) requires a profound dedication to the systemic way of thinking and acting in the organization. In Figure 20, each of the six systemic design perspectives (introduced in Chapter 5.1) is

categorized based on its requirement for organizational maturity concerning systemic work (introduced in Chapter 5.3).

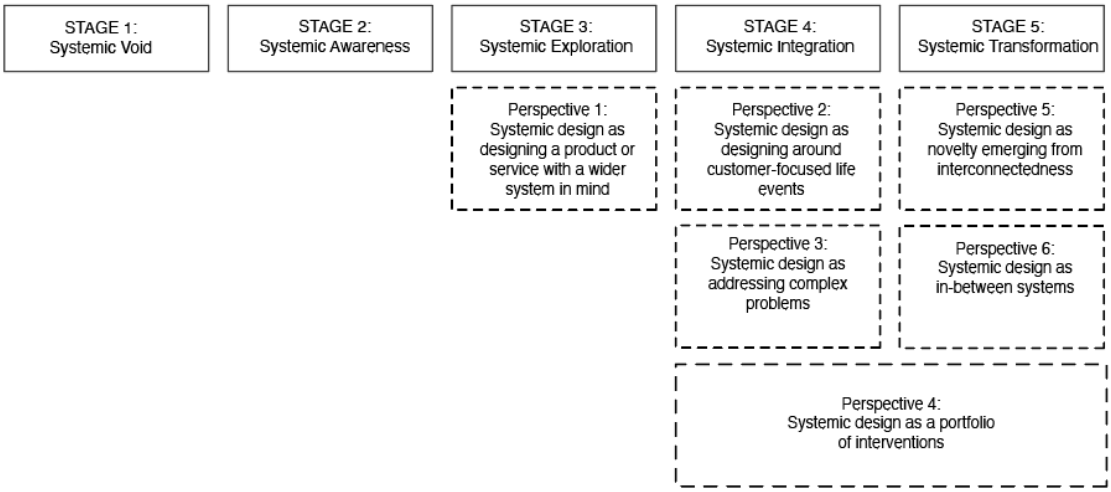


Figure 20: Matrix of organizational maturity and systemic design perspectives

In this matrix, Perspective 5 (novelty emerging from interconnectedness) and Perspective 6 (in-between systems) are categorized within the highest organizational maturity level, Stage 5, because both of those perspectives require deep systems-level thinking. One has to move away from problem-focused thinking (Dorst, 2019) and focus on the system itself and its interconnections and interrelations. This also means moving away from individual users and stakeholders. This requires the organization to act at the system level to facilitate collective learning within the entire ecosystem. At this stage, the focus has moved away from the organizations to the ecosystem and, in line with Otto Scharmer's matrix of social evolution (Scharmer, 2015) from a networked way of organizing to an ecosystem co-creation.

Perspective 2 (designing around customer-focused life events) and Perspective 3 (addressing complex problems) fall under Stage 4 which demands a relatively advances level of systemic maturity within the organization. Perspective 2 involves bringing together multiple actors and focuses on collaboration in the system to enhance customer benefits. Unlike Perspective 5 and 6, it recognizes an individual user. At Stage 4 the focus of the organization is still very much on the organization's benefit instead of the interests of the entire system. While there may be networked stakeholder groups involved, the mindset hasn't expanded to the ecosystem level yet, as outlined in Otto Scharmer's matrix of social evolution (Scharmer, 2015). Additionally, Perspective 3, which entails systemic design to address complex problems, also falls within Stage 4. However, complex problems are widely used as a starting point in systemic design, thus leading to overlaps with other perspectives.

Perspective 4, systemic design as a portfolio of interventions is placed under Stages 4 and 5 as it usually starts by addressing a complex problem (closer to Perspective 3) or building upon the existing portfolio of projects (closer to Perspective 5). It would be difficult to implement this type of systemic work within an organization having a strong reductionist way of operating.

Perspective 1 (designing a product or service with a wider system in mind) is categorized within Stage 3 as Perspective 1 can potentially be implemented in an organization that doesn't fully support systemic design. Even though the design considers the effects on the environment, i.e. communities, society, the economy, and the environment (van der Bijl-Brouwer, 2023), it doesn't necessarily systemically seek external contributions or challenge the organization's reductionist way of operating.

This matrix provides a simplified representation of the different organizational needs of each systemic design perspective, but the reality is far more nuanced. The six perspectives presented may not, and most likely not, neatly correspond to the stages shown in the matrix. Instead, they often intersect with and overlap each other. However, the matrix aims to visually present how different systemic design perspectives require varying levels of organizational maturity to be effectively implemented.

Additionally, as discussed in Chapter 5.3, where each stage of organizational maturity was described, it becomes evident that as systemic maturity increases, the emphasis shifts toward how an organization relates to, operates within, and influences the system. Consequently, it becomes more of a leadership issue and less a design issue. While this thesis primarily focuses on (systemic) design, it acknowledges the limitations of design in effecting systemic change in general.

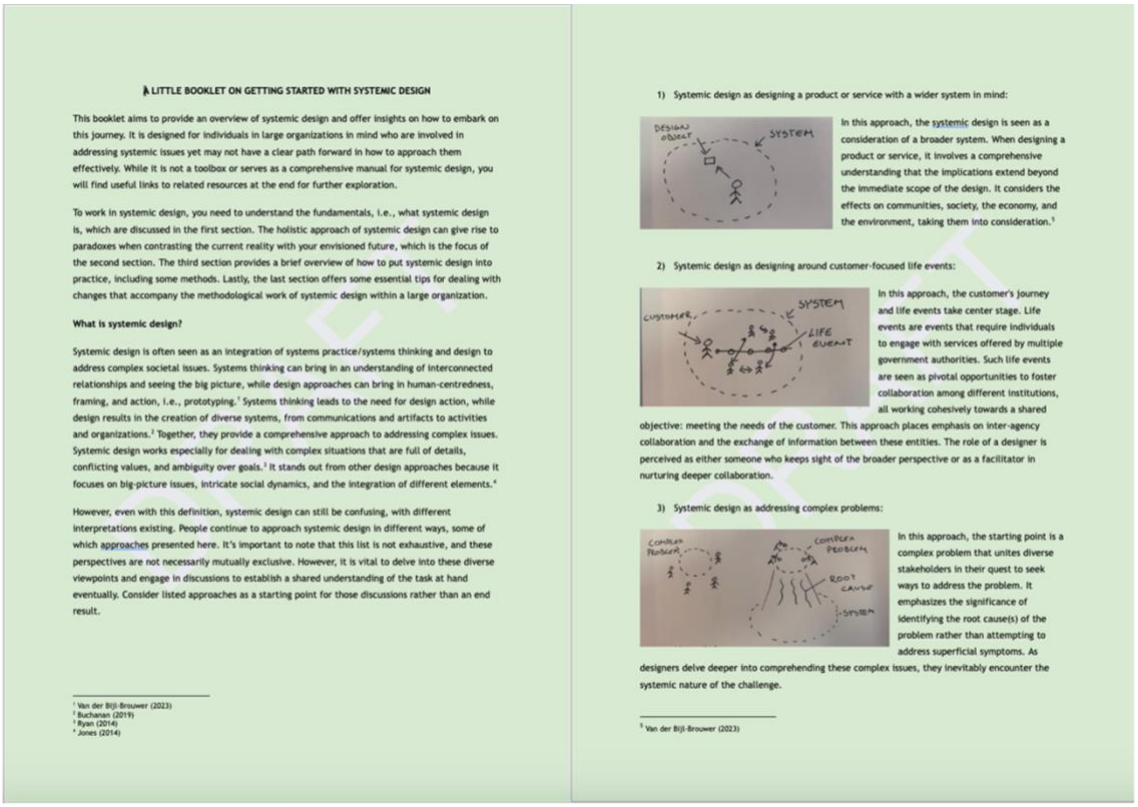
6 Systemic Design Booklet

This chapter presents the final outcome of the thesis, a systemic design booklet, and outlines its development process. A link to the booklet is shared at the end of this chapter.

The purpose of this thesis was to provide knowledge and understanding of systemic design and package it in a format that is both accessible and digestible. This was intended to assist designers and others in incorporating systemic perspectives into their work and initiating the integration of systemic design within the organization. The majority of the new insights generated were presented in the previous chapter (Chapter 5), and these, along with some supplementary information, were synthesized into a more user-friendly booklet.

The booklet aims to serve as an introductory guide to systemic design, a topic often perceived as complex and sometimes overwhelming, and potentially help to get started with systemic design. The intention was to cater to designers (and others) at varying levels of familiarity with the topic: those unfamiliar can gain an introduction, while those more knowledgeable can utilize the material to effectively communicate their work both internally and externally.

The development process of the booklet was iterative with regular discussions held with the focal point of the commissioning organization throughout. The initial version was created using Google Docs, incorporating handwritten drawings. See Figure 21 for sample pages from the first draft of the booklet. It was distributed among 40 individuals within the commissioning organization, including in-house designers, those interested in design, members of the innovation and foresight teams, as well as development professionals. Additionally, it was shared with two external individuals: a subject matter expert and a learning and development specialist. The objective was to gather feedback on the content's usefulness, strengths, areas for improvement, and potential impact on their work. The feedback form can be found in Appendix 2.



A LITTLE BOOKLET ON GETTING STARTED WITH SYSTEMIC DESIGN

This booklet aims to provide an overview of systemic design and offer insights on how to embark on this journey. It is designed for individuals in large organizations in mind who are involved in addressing systemic issues yet may not have a clear path forward in how to approach them effectively. While it is not a toolbox or serves as a comprehensive manual for systemic design, you will find useful links to related resources at the end for further exploration.

To work in systemic design, you need to understand the fundamentals, i.e., what systemic design is, which are discussed in the first section. The holistic approach of systemic design can give rise to paradoxes when contrasting the current reality with your envisioned future, which is the focus of the second section. The third section provides a brief overview of how to put systemic design into practice, including some methods. Lastly, the last section offers some essential tips for dealing with changes that accompany the methodological work of systemic design within a large organization.

What is systemic design?

Systemic design is often seen as an integration of systems practice/systems thinking and design to address complex societal issues. Systems thinking can bring in an understanding of interconnected relationships and seeing the big picture, while design approaches can bring in human-centredness, framing, and action, i.e., prototyping.[1] Systems thinking leads to the need for design action, while design results in the creation of diverse systems, from communications and artifacts to activities and organizations.[2] Together, they provide a comprehensive approach to addressing complex issues. Systemic design works especially for dealing with complex situations that are full of details, conflicting values, and ambiguity over goals.[3] It stands out from other design approaches because it focuses on big-picture issues, intricate social dynamics, and the integration of different elements.[4]

However, even with this definition, systemic design can still be confusing, with different interpretations existing. People continue to approach systemic design in different ways, some of which approaches presented here. It's important to note that this list is not exhaustive, and these perspectives are not necessarily mutually exclusive. However, it is vital to delve into these diverse viewpoints and engage in discussions to establish a shared understanding of the task at hand eventually. Consider listed approaches as a starting point for those discussions rather than an end result.

[1] Van der Bijl-Brouwer (2023)
[2] Buchanan (2019)
[3] Ryan (2014)
[4] Jones (2014)

1) Systemic design as designing a product or service with a wider system in mind:

In this approach, the systemic design is seen as a consideration of a broader system. When designing a product or service, it involves a comprehensive understanding that the implications extend beyond the immediate scope of the design. It considers the effects on communities, society, the economy, and the environment, taking them into consideration.[5]

2) Systemic design as designing around customer-focused life events:

In this approach, the customer's journey and life events take center stage. Life events are events that require individuals to engage with services offered by multiple government authorities. Such life events are seen as pivotal opportunities to foster collaboration among different institutions, all working cohesively towards a shared objective: meeting the needs of the customer. This approach places emphasis on inter-agency collaboration and the exchange of information between these entities. The role of a designer is perceived as either someone who keeps sight of the broader perspective or as a facilitator in nurturing deeper collaboration.

3) Systemic design as addressing complex problems:

In this approach, the starting point is a complex problem that unites diverse stakeholders in their quest to seek ways to address the problem. It emphasizes the significance of identifying the root cause(s) of the problem rather than attempting to address superficial symptoms. As designers delve deeper into comprehending these complex issues, they inevitably encounter the systemic nature of the challenge.

[5] Van der Bijl-Brouwer (2023)

Figure 21: Sample pages from the first draft of the booklet

A total of 12 individuals provided feedback: 10 from within the commissioning organization who filled in the feedback form, and two external individuals who provided verbal feedback. In summary, the booklet was considered a valuable resource, particularly as an overview and

as an introduction to the topic. For example, respondents reported that they could use the booklet as a basis for discussion at the beginning of a collaborative project. However, some respondents, particularly those with greater expertise, expressed a desire for deeper insights and strategic perspectives. In response, a maturity model was developed offering insights into the integration of systemic design within organizational contexts. Additionally, further adjustments were made based on received feedback, including the addition of reflective questions to enhance its utility and finalized visualizations. This more finalized version of the booklet was also shared with the team for their feedback. Adjustments were primarily made to enhance the layout and improve the overall readability of the booklet.

The final version of the systemic design booklet is available here: https://bit.ly/3WQTv6H. It is open for anyone to read and utilize for their benefit (while the author still holds copyrights over its content). This is also in alignment with the commissioning organization's aim for broad applicability and accessibility.

7 Conclusions

The aim of this thesis was to explore systemic design as a field and provide valuable insights into its implementation within organizations. The world faces complex problems requiring systemic approaches, but organizations do not always know how to. This study was undertaken at the request of Kela, who is interested in delving deeper into addressing systemic issues and has also identified a gap in the knowledge in this field. Data was collected from individuals with diverse experiences in systemic design or equivalent systems-oriented work across multiple organizations. Based on the results, the path to systemic design in organizations was created, which is detailed in Chapter 5. In response to the aim of this thesis, this study has addressed it through two research questions. The answers to these questions can be summarized as follows:

RQ1: How do different actors across multiple organizations perceive systemic design?

Systemic design is perceived in various ways. Six systemic design perspectives emerged from this study, as listed in Figure 22 (See more details of the perspectives and a visual illustration of each perspective in Chapter 5.1). These perspectives are not mutually exclusive.

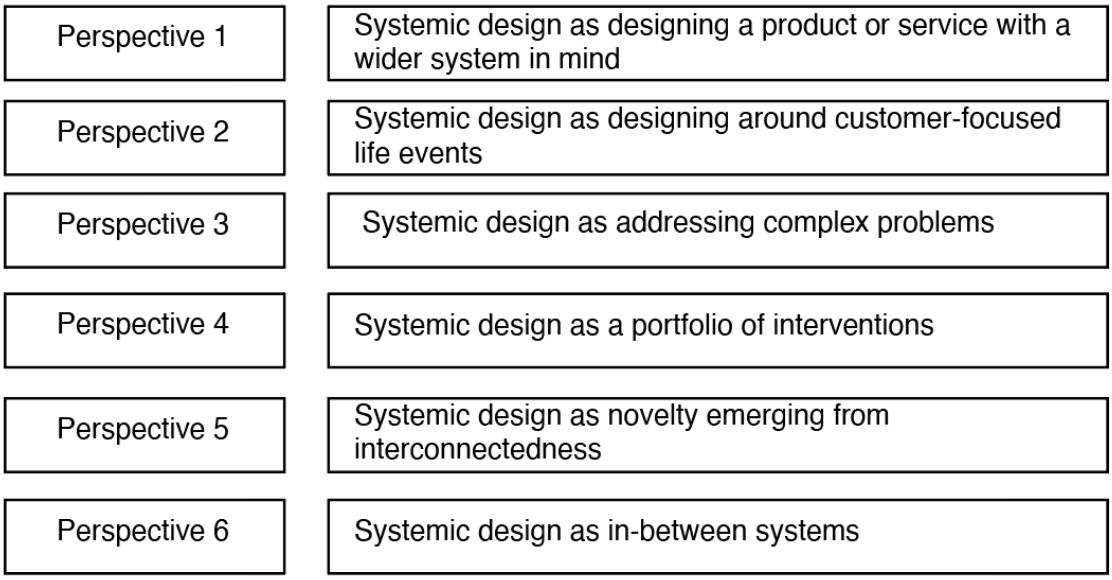


Figure 22: Six perspectives of systemic design

RQ2: What approaches can organizations adopt to integrate systemic design practices into their operations?

Empirical evidence suggests an approach based on principles and crucial elements instead of specific methodologies or frameworks for systemic design. In this study, these elements—methodology, learning, collaboration, and organization—were identified. They form the basis of a four-layer systemic design framework, offering a comprehensive overview of systemic design, particularly emphasizing how to engage in systemic design and the essential requisites involved (see Chapter 5.2).

- Methodology: This focuses on acknowledging and understanding the system, making sense of it, and generating new options for the future.
- Learning: Learning is crucial in systemic design in various ways. It encompasses systemic design methodologies, including sensemaking, as well as a learning mindset (e.g. continuous learning and acknowledgment of not knowing), learning culture (organizations prioritizing learning), and practice (learning throughout the process). It also involves demonstrating impact and monitoring and evaluation. System-level learning plays a key role.
- Collaboration: Collaboration involves crucial elements such as power dynamics, diversity, multiple perspectives, inclusion, and collective effort. System-level collaboration, especially across different disciplines, is vital. The focus should be on creating transformative partnerships that are less transactional.

- Organization: Organizations should shift focus from organizational benefits to system-wide benefits and navigate uncertainty. Top-level management support is crucial, and it's important to recognize where the power lies (which is not always the same).

Theoretical contributions

By conceptualizing six different perspectives on systemic design (see Chapter 5.1), accompanied by illustrations, this study offers a nuanced understanding of how systemic design is perceived. As discussed earlier, in the literature, a common definition of systemic design characterizes it as a combination of systems thinking/approaches and design thinking/approaches (e.g. Sevaldson and Jones, 2019; Jones and Van Ael, 2022; van der Bijl-Brouwer, 2023). Additionally, systemic design can also be called by different names, such as systems-led design, design for complexity or systems or systemic innovation (Blomkamp, 2022). The results of this study align with the literature in that interviewees also referred to systemic design by various names. However, the study provides more nuanced insights into the common definition of systemic design. It reveals significant differences among these six perspectives, particularly in terms of how change is initiated (e.g., starting points) and the extent of change attempted (e.g., incremental vs. transformational). Additionally, despite literature suggesting that systemic design does not focus on a single user (e.g. Dorst, 2019), this is often the case in some perspectives.

The development of a systemic design framework (see Chapter 5.2), informed by interviews, offers a structured approach to understanding and implementing systemic design. As mentioned earlier, systemic design frameworks exist in the literature, such as the Systemic Design Framework by the Design Council (2021), and frameworks by Ryan (2014) and Costa Junior et al. (2019). While there are similarities with these existing frameworks, for example, the focus on principles instead of a fixed set of methodology, the most notable difference in the framework is the explicit inclusion of an 'organization' layer. The findings of this research show that the organization plays a key role, with many challenges associated with systemic design being linked to organizational limitations that either support or hinder systemic efforts. A significant issue highlighted by the study is the misalignment between organizational and systemic interests, hindering the achievement of long-term systemic goals. Organizations must look beyond their operations and understand their role within the system (Singh, 2022). However, the study reveals this to be challenging, as systemic work may be perceived as outside their mandate or scope of work or threatening the organization's existence.

The research findings highlight the critical role of collaboration and learning in systemic design, while also revealing significant challenges at both institutional and individual levels, aligning with existing literature. Regarding collaboration, the literature emphasizes equitable

partnerships while acknowledging the complexity and competition in working with others (Design Council, 2021). Furthermore, the findings underscore the importance of recognizing power dynamics, consistent with insight from Drew et al. (2022) regarding the need to reconsider or redistribute power. In terms of learning, Seppälä (2022b) discusses the importance of learning ecosystems, where learning takes place at the interfaces of organizations. However, the findings indicate challenges in this regard, as the mindsets and the organizational environment prioritize outputs and delivery over continuous learning. This underscores organizational-related issues as significant barriers to systemic design.

Creating a maturity model specifically tailored to systemic design (see Chapter 5.3) fills a gap in the existing literature as the current literature on incorporating systemic design into (public) organizations is limited. While literature on customer-focused approaches in organizations may be somewhat applicable, it may fall short in addressing the needs of systems-wide work. For example, Singh's thesis (2022) demonstrated, that the customer-centric lens is insufficient to encompass the ecocentric lens. The created maturity model is novel knowledge as there are no other maturity models identified, or at least not within the scope of the current research, that specifically target systemic design. For instance, the extended version of the Design Ladder by Hoedemaeckers (2016) adds systemic change as a stage on top of the original four stages of the Design Ladder by the Danish Design Centre. However, the maturity model proposed in this study focuses on systemic design as a whole — a five-stage journey, from no systemic awareness to profound systemic transformation. Additionally, this study reflects the six perspectives in relation to organizational maturity (see Chapter 5.4) and concludes that different systemic design perspectives require varying levels of organizational maturity to be effectively implemented.

Practical contributions

The development purpose of this study was to provide a practical understanding of systemic design and its integration into an organization. The study has a dual benefit for the commissioning organization. One, the research provides general insights and new knowledge about the topic for the benefit of the commissioning organization. Two, this information has been turned into a practical booklet. The booklet is designed to support designers and others in the organization in incorporating systemic design into their work and initiating the integration of systemic design within the organization at large. While there are multiple ways to integrate new practices into an organization, in this case, the emphasis was placed on providing designers and others with the necessary information through this booklet.

7.1 Limitations and Further Research

Research is often evaluated through reliability (replicability of the measures) and validity (accuracy of measures), however, Saldaña (2011) argues that in the qualitative paradigm,

credibility and trustworthiness are more appropriate factors to consider. There are several factors influencing the credibility of the research. In this regard, like any study, this one is not without limitations. The number of interviewees was limited which might have led to a narrow perspective on the topic. In general, a broader scope requires more participants (Morse, 2000 cited in Braun and Clarke, 2013) and as the scope of this study was broad, a higher number of interviewees would have allowed for a more comprehensive exploration of the topic. Additionally, with a larger sample size, it would have been possible to achieve saturation, the point when nothing new is coming up (Richards, 2015) ensuring that no new significant insights emerged from further interviews.

Despite employing selection criteria for participants, interviewees came from diverse backgrounds across various organizations, both within and outside Finland. The contexts in which participants worked varied significantly, as did their perspectives and levels of experience with the topic. Additionally, some participants used different terms, such as systems innovation and portfolio design or approach, instead of systemic design. Because of this diversity, the data collected in the interviews may be fragmented. Therefore, the opinion of a single participant can have a significant influence and thus potentially skew the overall interpretation of the findings. This has influenced the study results and may limit the depth and generalization of the findings, meaning how well we can apply them to the wider population (Braun and Clarke, 2013). Choosing other interviewees might have provided different results.

This study most likely has been influenced by the researcher's unconscious biases or assumptions. Bias is when the researcher might have unintentionally influenced the results (Braun and Clarke, 2013). This is not unusual as, "*all social research has bias, because researchers always take in assumptions and experience*" (Richards, 2015 p. 29). Even though an effort to reflect on biases was made, there is a possibility that those biases and underlying assumptions have influenced the interpretation of the results, and thus this work. Additionally, data collection and analysis processes utilized two languages, Finnish and English, which has influenced the nuanced meanings of the translated texts.

As with any research, this study opened opportunities for new research that could address some of the above-mentioned limitations. First, conducting in-depth case studies of organizations at a more mature stage in their journey to integrating systemic design into their operations would be beneficial for better understanding the organizational implications of systemic design. Such case studies would allow for a more in-depth exploration of systemic design practices and their implementation within a real-world context.

Second, while this thesis aimed to provide both theoretical insights and practical tools, these have not been tested in real-life contexts. Therefore, conducting a longitudinal study to

research the implementation and effectiveness of these frameworks and models in organizations over time would be beneficial.

Third, each of the six systemic design perspectives could be further researched to study their similarities and differences more comprehensively.

7.2 Reflections

This study turned out to be both broader and narrower than I expected. Initially, the focus was more on organizational aspects and the integration of systemic design into organizations. However, it became apparent early on that before doing so it was necessary to make some sense of systemic design itself. As a result, a significant portion of my time was dedicated to exploring the concept and its various interpretations before I was able to focus on the organizational aspects. Consequently, the study also became narrower, as I was not able to delve into organizational aspects as deeply as I had hoped.

Throughout the research, I often debated the balance between complexity and simplicity. While practicality, and thus a certain degree of simplicity, is beneficial for organizations, presenting such a topic in the context of one thesis without oversimplifying it was challenging. The risk of trivialization was present throughout. I aimed to strike a balance that respects the complexities of the topic while making it useful for organizations.

I have taken quite a few liberties. While this thesis is about systemic design, it could also be seen as relevant to systems work in general. Most of the participants of this study were not strictly systemic designers per se, but all of them worked on systemic issues in one way or another – some more ‘designerly’ than others. I have chosen to categorize them under systemic design. However, I believe the lines between different systemic approaches are somewhat blurred, and many systems approaches overlap with each other.

I don’t think and neither does this thesis suggest that systemic design is a magic wand to our complex systemic problems but rather one approach among others. Systemic design is a relatively new and continually evolving field. What I have presented in this thesis is tentative and incomplete. I hope that it contributes to the ongoing discourse on systemic design and systems change in general.

Lastly, I would like to thank the commissioning organization, and particularly Janne Mattila, for the opportunity to delve into this complex yet interesting topic, all the interviewees who generously shared their time, knowledge, and experiences, and my supervisor Ruusa Ligthart for all her advice throughout the process. I’m also grateful to the systems expert Mikael Seppälä for his introductions and insights, and to H. Park for his contributions to the illustrations.

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ChatGPT by OpenAI has been used for editing and improving the readability and clarity of the text in this thesis.

Figures

Tables

Appendices

Appendix 1: Interview guide

Aim

The aim is to explore ways to integrate systemic design into the organization; understand the challenges of systemic design, and identify approaches, methods, skills, etc. that would enable a greater impact at the systemic level.

Introduction

- Introduction
- The interview will be recorded and used for note-taking and transcription purposes. The recording will be deleted upon completion of the final work.
- Interview responses will be anonymized, and answers cannot be linked to the interviewees.
- The interview will last approximately 1 hour.
- There are no right or wrong answers, I am interested in your thoughts and experiences.

In the interview, I will be talking about systemic design, but your work or job title doesn't have to be in design. By systemic design, I mean an approach or method that seeks to understand and address complex problems by considering the interconnectedness and interdependencies of systems.

Questions

About the interviewee

1. Could you start by telling me a little bit about yourself?
2. What is your job description? What are your areas of responsibility? How long have you worked in this organization/role? Whom do you work with (collaborators)?
3. What does systemic design mean to you?

Systemic problems

4. What thoughts do systemic problems evoke in you?
5. To what extent are systemic problems on your organization's agenda?
6. To what extent do systemic problems manifest in your own work? Can you think of any examples of systemic problems you have encountered in your work?

Systemic design /addressing systemic problems

7. Does addressing systemic problems in any way fall within your job description?

   a. If yes, how?
   b. What methods do you use?
8. What challenges have you faced? What is difficult?
9. What works? What is easy?
10. Has your approach changed over time? If yes, how and why?
11. Can you think of any examples?
12. Do you believe that organizational context and specificities play a significant role in systemic design? In other words, would the challenges and opportunities of systemic design be different if you were working in a different organization?
13. Related to the interconnections and interdependencies of the system, how do you interact with the operating environment? How do you interact within the organization?
14. What would help you (better) address systemic problems? What needs to change?
15. How do you envision an ideal situation?

Innovation and systemic design

16. How do you see the relationship between systemic design and innovation?

Finally

17. Is there anything else you would like to share about this topic (systemic problems, systemic design, or innovation and systemic design)?

Appendix 2: Feedback form

Palautekysely/Feedback form: A little booklet on systemic design

Please review the draft of the booklet (https://tinyurl.com/ymf7veve). After reviewing it, please answer the following questions. You can answer in English or Finnish. Thank you for taking the time!

Lue esite systeemisestä muotoilusta (https://tinyurl.com/ymf7veve) ja vastaa sen jälkeen allaoleviin kysymyksiin.Palautekyselyyn voi vastata suomeksi tai englanniksi. Kiitos osallistumisestasi!

1. To what extent are systemic issues part of your work?

Kuinka paljon systeemiset ongelmat ja niiden kanssa työskentely sisältyvät työhösi?

	1	2	3	4	5	
No involvement / hyvin vähän	○	○	○	○	○	Extensive involvement / laajasti

2. Please indicate your level of experience in the field of systemic design

Miten arvioisit kokemuksesi systeemisestä muotoilusta?

- ◯ No experience / ei kokemusta
- ◯ Beginner / alkeet
- ◯ Intermediate / keskitaso
- ◯ Advanced / edistynyt
- ◯ Expert / asiantuntija

3. How much did the booklet provide you with new information?

Kuinka paljon esite tarjosi sinulle uutta tietoa?

	1	2	3	4	5	
No new information / Ei uutta tietoa	◯	◯	◯	◯	◯	A significant amount of new information / Runsas määrä uutta tietoa

4. What do you think about the length of the booklet?

Mitä olet mieltä esitteen pituudesta?

- ◯ Too short / Liian lyhyt
- ◯ Just the right length / Sopivan pituinen
- ◯ Too long / Liian pitkä

5. What aspects of the booklet did you find most useful?

Mitkä esitteen osa-alueet olivat mielestäsi hyödyllisimpiä?

6. Were there any parts of the booklet that you found less useful? If yes, please specify.

Oliko esitteessä osia, jotka olivat sinusta vähemmän hyödyllisiä? Jos kyllä, niin kerro tarkemmin.

7. Was something unclear? If yes, please specify.

Oliko jokin asia epäselvä? Jos kyllä, niin kerro tarkemmin.

8. Are there any sections or topics that you felt were missing and should be included in the booklet?

Onko jotain osioita tai aiheita, jotka mielestäsi puuttuivat esitteestä ja tulisi siihen sisällyttää?

9. What benefits could the booklet have for your work?

Mitä hyötyä esitteestä voisi olla työssäsi?

10. Do you know how to apply the information from the booklet in your work? If not, what else would you need?

Tiedätkö miten soveltaa esitteen tietoja työssäsi? Jos et, niin mitä muuta tarvitsisit?

11. Do you have any other comments, suggestions, or ideas to improve the booklet?

Onko sinulla muita kommentteja, ehdotuksia tai ideoita esitteen parantamiseksi?

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