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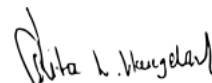
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Abstract

Given the context of a multi-actor innovation project, this case study aims to study the experience of the representative actors involved to answer our research question. The aim of the thesis was to identify how a short-term multi-actor project, characterized by spanning interests and partly conflicting agendas, can contribute to sustainability-oriented innovation. Our analysis revealed how the three robust action strategies *participatory architecture*, *multivocal inscription* and *distributed experimentation* come into play, specifically, how these are operationalized through certain key criterias in the multi-actor project. We found that the multi-actor project partially aligns with the strategies that the robust action framework anticipates. Our analysis further revealed that the robust action strategies framework could benefit from being extended to include an additional underlying supportive structure, which we label *towards a system understanding*, comprising two subcategories, *robust meaningmaking* and *shared system understanding*. Ultimately, we argue that by extending the current robust action strategies framework, the process of tackling grand challenges becomes more attainable throughout an ongoing iterative and dynamic process. Theoretical implications, limitations, and future research are discussed.

Part I: Introduction

1.1 Introduction

We have become, by the power of a glorious evolutionary accident called intelligence, the stewards of life's continuity on earth. We did not ask for this role, but we cannot abjure it. We may not be suited to it, but here we are. (Gould, 1985, p. 431)

As Gould emphasizes, humankind must deal with a new ecological responsibility in which we are not equipped to tackle (Ergene et al., 2021). We are living in a time referred to as the Anthropocene, characterized by a dominant human influence on the planet. Simultaneously, it is important to consider that these harmful ecological conditions we are facing today are a result of political and economic regulations and actions pursued to exploit natural resources for the benefit of a few.

Sustainability was put on the agenda already in 1987 because of the Brundtland report and can be defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987). More than 33 percent of global greenhouse gas emission can be attributed to human activities related to production, processing, and packaging of food (The UN, 2021). Accordingly, food production is a resource-intensive activity with detrimental consequences for the environment. Despite the economic wealth, access to healthy food is still an issue globally. Public health issues such as obesity and diabetes have emerged because of unhealthy food and poor eating habits. Failing to grapple with such complex and profound challenges can create severe consequences for future generations (Steffen et al., 2015). These challenges can be referred to as grand challenges, as it is impossible to locate a single cause or answer due to the interconnected nature of the various elements (Grewatch, 2021).

As a response to grand challenges, sustainability-oriented innovations have gained increased attention in recent years. Sustainability-oriented innovation (SOI) does not simply consider economic returns but incorporates a social and environmental dimension as well (Adams et al., 2016). Scholars argue that SOI can be

considered a key strategic approach to enable sustainable development (Fichter & Clausen, 2016; Hall & Vredenburg, 2003). Lately, individuals, organizations and NGO's and other stakeholders have become involved in sustainability efforts (Etzion et al., 2017). The context is thus defined by a shift towards multi-actor efforts in which sustainability innovation is created in collaboration, rather than by the individual firm (del Rio et al., 2010). Novel collaborations are essential for system transformation; dialogue is created, legitimacy is fostered, and knowledge is acquired, and novel solutions emerge (Adams et al., 2016).

This master thesis aims to explore how a short-term multi-actor project characterized by spanning interests and partly conflicting agendas can contribute to sustainability-oriented innovation. Even though our research question addresses SOI on a general level, our emphasis is on SOI as an integrated collaboration that has the potential to foster system transformation. Through a collaboration with Æra Strategic Innovation, we investigated the project Matfloken (Food Floke), an innovation project conducted from August 2019 to March 2020 (Æra, n.d.-b). Floke, which can be translated into grand challenges or wicked problems, are open innovation projects transforming societal challenges into business opportunities across industries and organizations (Æra, n.d.-a). The goal of the project was to gather representatives from different parts of the value chain to diagnose the problems related to the Norwegian food system, ultimately seeking to achieve systemic change. Through our master thesis we examine whether SOI was achieved in the project, particularly whether system transformation is possible through a short-term multi-actor project, characterized by divergent actors.

Our master thesis will be a qualitative case study, guided by an iterative, highly intuitive, and open approach. Our analysis will be based on in-depth interviews with representatives from Æra, as well as participants from Matfloken. Through this case study, we will explore how the robust action framework can be utilized to tackle grand challenges.

1.2. Research question

In response to the pressing need to understand how novel collaborations can generate radical solutions and system transformation, our research question is as follows:

How can a short-term multi-actor project, characterized by spanning interests and partly conflicting agendas contribute to sustainability-oriented innovation?

1.3. Outline of thesis

To answer our research question, the remainder of this master thesis is structured as follows. Part II reviews the theoretical background. The chapter gives a brief overview of grand challenges. We elaborate on the literature on sustainability-oriented innovation as an integrated collaboration process aimed at accomplishing system change. Further, we give a brief overview of design thinking as an innovation practice. In the final part of the chapter, we situate multi-actor perspectives in the literature by elaborating on robust action strategies. In part III, we give an overview of the methodological framework, including the research context, followed by the design and data collection, data analysis and ethical considerations. Part IV is the presentation and analysis of our empirical data, highlighting the presence of three robust action strategies and their impact on sustainability-oriented innovation. We also suggest an extension of the robust action framework, proposing two additional categories. Finally, in part V of the thesis, we summarize and discuss the findings, before highlighting the implications, limitations, and suggestions for future studies.

Part II: Theoretical background

2.1. Introduction

This section will review the literature related to Grand Challenges, Sustainability-Oriented Innovation (SOI), Design Thinking (DT) and Robust Action Strategies. First, we engage in understanding sustainability as a grand challenge and outline its three shared characteristics to shed light on the complexity and ambiguity of multi-actor projects such as Matfloken. This underlines the existence of spanning interests and partly conflicting agendas associated with grand challenges. Second, we will elaborate on the SOI literature and how it relates to grand challenges. Even though our research question addresses SOI on a general level, our emphasis is on SOI as an integrated collaboration process that has the potential to foster system transformation. Third, we explore design thinking as an innovation practice. We further outline design thinking as a beneficial approach to innovation projects, characterized by actors with diverging interests. Lastly, we will elaborate on the multi-actor perspective Robust Action Strategies as an approach to tackling grand challenges and achieve radical systemic innovation. We have chosen this framework since it offers an alternative way of understanding grand challenges through multivocality, and the non-committal strategies. Therefore, this theoretical framework will be more extensively reviewed to analyze how a short-term multi-actor project can contribute to SOI.

2.2 Sustainability as a grand challenge

Sustainability challenges can be conceptualized as grand challenges (Gehman et al., 2022; Howard-Grenville et al., 2020) or wicked problems (Head & Alford, 2015). Throughout this master thesis, we will apply the term grand challenges. The fundamental principles underlying a grand challenge are “the pursuit of bold ideas and the adoption of less conventional approaches to tackling large, unresolved problems” (Colquitt & George, 2011, p. 432). Essentially, grand challenges are unresolved problems with far-reaching societal implications (Gehman et al., 2022). Matfloken is a multi-actor project that aims to contribute to solving a grand challenge, namely creating a sustainable food system. Although grand challenges is an umbrella term for various and diverging challenges, Ferraro

et al. (2015) argue that grand challenges fundamentally share three common characteristics. Namely, *complex*, *uncertain*, and *evaluative*.

The complexity of grand challenges emerges from the multiple interactions and associations (Ferraro et al., 2015). While the blame is often directed towards single organizations or industries, the root cause of the grand challenges are often systems, institutions, and networks (Sterman, 2001). Furthermore, the problems are characterized as dynamic and nonlinear. One example is the dilemma concerning lowering livestock consumption to reduce greenhouse gas emissions, and as such, raises the question of how harmful that would be to the cultural landscape in Norway. This illustrates how proposed solutions often generate new problems, requiring even more innovative solutions and further adjustment (Ferraro et al., 2015; Gehman et al., 2022).

Grand challenges are also characterized by radical uncertainty as scientists cannot predict the future state of the world (Ferraro et al., 2015; Gehman et al., 2022). This implies that future consequences cannot be enumerated or assigned probabilities, making it difficult for actors to grasp the full repercussions. As such, it is hard to provide a clear solution and direction for action (Ferraro et al., 2015; Gehman et al., 2022). Regarding sustainable food systems for example, there exists a lot of conflicting information about the potential consequences deriving from the production and consumption of food; thus, making it difficult to comprehend the future consequences.

Finally, grand challenges are evaluative, implying that there is no clear-cut definition (Ferraro et al., 2015). The challenges cut across institutional boundaries, and thus, diverse actors can have radical and conflicting assessments. Grand challenges can be described from an economic perspective, a social perspective or as a political issue but none of these are purely right or wrong. In multi-actor projects, actors have diverse perspectives to what the problem is, and what constitutes an appropriate solution. Therefore, one single evaluation cannot be decisively demonstrated. Overall, these three characteristics pose a significant organizational challenge. As such, tackling them requires finding new ways of working together across boundaries, such as through the robust action strategies, which will be presented later in this chapter.

2.2.1. Sustainability-oriented innovation as a pathway to solve grand challenges

In the following, we will elaborate on how the growing concern related to grand challenges has resulted in a greater emphasis on creating sustainable development. As a result, organizations are encouraged to explore ways to come up with sustainable solutions, and as such the role of sustainability-oriented innovations has become increasingly important. We have chosen to apply the definition from Adams et al. (2016) that refers to sustainability-oriented innovation (SOI) as “making intentional changes to an organization’s philosophy and values, as well as to its products, processes or practices, to serve the specific purpose of creating and realizing social and environmental value in addition to economic returns” (p. 181). SOI does not unfold in a vacuum but is rather embedded in a larger system. As such, SOI is influenced by multiple factors, such as technological enhancement, market forces, policies and regulations as well as public opinion (Buhl et al., 2019; Horbach et al., 2012).

Firms engaging in SOI are likely to encounter difficult challenges that are particularly relevant for SOI development, such as integrating a vast number of stakeholders, defining an appropriate innovation scope as well as comprehending the underlying user needs (Buhl et al., 2019). A key question to sustainability is what type of innovation activities organizations must participate in to become sustainable (Adams et al., 2016). Further, sustainability is not about being sustainable or not, it is rather about the journey towards becoming sustainable. There will always exist uncertainty and ambiguity concerning the outcomes and impact of sustainable innovation (Hall et al., 2011). This is further supported by Lubberink et al. (2017) who emphasizes that disruptive and complex innovations may have short-term benefits, however, also fostering dilemmas and unintended consequences in the long term. This implies that even high-potential innovations wither away due to the lack of integrating ethical and societal concerns.

In their influential work, Adams et al. (2016) draws a distinction between three approaches or levels of SOI. First, *operational optimization* refers to the process of increasing efficiency through reactive, incremental improvements. This is referred to as *doing the same things but better* (Adams et al., 2016) and is characterized by being largely internal and insular in nature, thus centered around

efficiency gains and complying with existing laws and regulations. Most companies embrace this innovation approach, as moving beyond organizational optimization demands a more radical approach that considers the complexity and ambiguity (Adams et al., 2016). Second, *organizational transformation* refers to a fundamental shift in mindset and purpose for organizations centered around creating shared value and providing wider benefits for society (Adams et al., 2016). This is referred to as a *doing good by doing new things*, and is less insular, yet it remains largely internally oriented but extends to external stakeholders as well.

Beyond these are the highest levels of SOI, namely *systems building* (Adams et al., 2016). This is referred to as *doing good by doing new things with others*, which implies that no single actor or firm can create sustainable value alone. Rather, there is a need for integrated collaboration that might foster system transformation. This illustrates the role of multi-actor projects, such as Matflokken when trying to tackle more profound, and complex issues that strive to create system change. However, solving such challenges require organizations to abandon the current economic paradigm that emphasizes profit maximization to reshape the purpose of organizations as a part of society (Dyllick & Hockerts 2002; Esslinger 2011; Stubbs & Cocklin, 2008). Furthermore, Gaziulusoy (2015) also highlights the importance of emphasizing systems thinking, long-term orientation and radicality to foster truly sustainable innovation. Systems thinking requires innovators to shift their focus from the individual organization's performance to the system. By incorporating systems thinking, innovators can more fully comprehend the grand challenges by looking beyond the individual parts and create linkages between distal connections that are dynamic in nature (Gaziulusoy, 2015; Grewatsch et al., 2021). Thus, potentially stimulating evolutionary dynamics at the system level. Due to the complexity of system innovation, there is also a need for adopting a long-term orientation (Gaziulusoy, 2015). This long-term perspective greatly exceeds the time frame usually applied by firms. Furthermore, there is a call for a shift from the focus on incremental innovations that solely creates symptomatic and short-term solutions, towards more radicality. They argue that incremental innovations simply allow the problems to continuously manifest elsewhere in the system (Cillo et al., 2019; Gaziulusoy, 2015).

Due to the collaborative nature of Matfloken and the ambition to create system transformation, we find it appropriate to apply the framework proposed by Adams et al. (2016) to evaluate how system thinking and radicality impacted the project. Since long-term orientation is highlighted as a prerequisite for such sustainable innovation projects, we want to investigate how the short time span of Matfloken impacts the extent to which system change can be attained.

2.3 Innovation practices

When facilitating Matfloken the design thinking methodology was applied. Thus, we consider it relevant to explore how design-thinking can be an appropriate innovation approach for this multi-actor project, which is characterized by divergent interests. Furthermore, we want to explore the literature behind design thinking and its role in generating sustainability-oriented innovations. The last decade we have seen an increased focus on developing appropriate processes, tools and methods to succeed with SOI, and tackle complex challenges, such as design thinking (Buhl et al., 2019; Carlgren et al., 2016; Shapira et al., 2017). Design thinking can be defined as “a human-centered, iterative problem-solving approach that involves stakeholders from various backgrounds” (Buhl et al., 2019, p. 1251). Design thinking was early proposed as a solution to wicked problems, which is equivalent to grand challenges. The wicked problem approach was proposed by the designer and mathematician Horst Rittel in the 1960’s. He argued that problems raised by designers were wicked in nature: “A class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision-makers with conflicting values and where the ramifications in the whole system are thoroughly confusing” (Buchanan, 1992, p. 15).

2.3.1 Design thinking in multi-actor projects with divergent interests

This master thesis is centered around investigating multi-actor projects that aim to tackle highly complex challenges through collaboration. In line with Adams et al. (2016), several scholars argue that truly sustainable innovations are hard to accomplish within a single firm, thus collaboration with other organizations is necessary (Anttonen et al., 2013; Cappa et al., 2016; Desouza et al., 2008). As sustainable innovations are iterative, rather than linear, they require continuous

interactions between relevant stakeholders. As such, sustainable innovation can be considered an ecosystem where internal organizational actors collaborate with external and divergent stakeholders (Foxon & Pearson, 2008).

Design thinking as a methodology can bridge the gap between actors with conflicting interests, as it increases trust, builds partnership, and leads to higher engagement (Liedtka et al., 2017). Thus, enabling enables stronger innovation outcomes. By involving relevant stakeholders and consumers in the process of creating and generating solutions, design thinking fosters a broad commitment to change (Liedtka, 2018). Further, the structure of design thinking enables actors with divergent interests to collaborate and create agreement about the outcome of each phase. The design thinking process creates a common platform for innovation and facilitates the interaction between the actors (Liedtka, 2018). Further, it enables the actors to reach shared insights and challenge each other's perceptions, and as such, mitigating the risk of bias. This illustrates the rationale behind choosing design thinking as the innovation methodology in multi-actor projects, such as Matfloken.

The core of collaboration processes is to draw upon other actor's insights, and to fill knowledge gaps; thus, brokering and nexus work can play an important role to play. Brokers are actors that can fill the knowledge gaps between different industries (Hargadon & Sutton, 1997). Designers in such multi-actor projects can function as brokers through using their skillset to generate new meaning (Verganti, 2003) and enable facilitation of the activities in multi-actor projects (Aguirre et al., 2017). Nexus work can be defined as "brokerage requiring synthesis or integration, rather than just communication or transference of ideas" (Lingo & O'Mahony, 2010, p. 47). This implies that designers play an important role in creating an integration in between innovation phases to facilitate a collective creative outcome.

2.3.2 Generating sustainability-oriented innovation through design thinking

Buhl et al. (2019) explored why and how design thinking can foster SOI by generating four prepositions which constitute a starting point to how DT can constitute a solution to SOI challenges. The main elements of DT are *user-focus*, *problem framing*, *visualization*, *experimentation* and *diversity* (Carlgren et al., 2016). The user focus and the diverse stakeholders help create sustainable

solutions that are capable of meeting user needs (Buhl et al., 2019). Furthermore, the iterative experimentation enables positive sustainability effects while limiting the risk of innovation failure. This framework aims at guiding practitioners who engage in SOI development in a way that reduces complexity and provides a means to overcome the challenges. Scholars argue that DT can create systemic solutions to grand challenges (Brown & Wyatt, 2010; Dewberry & Sherwin, 2002). Yet, research so far has been dominated by more conceptual rather than databased studies. Buhl et al. (2019) highlights that it remains unclear whether DT can generate radical system innovation, especially since the emphasis is on planet-centric rather than human-centric demands. Carlgren et al. (2016) highlight that DT is mostly used for creating incremental innovation. Ultimately, more research is therefore needed to establish how DT can generate SOI on a system level.

2.4. Multi-actor perspectives

In part 2.3, we outlined DT as an approach to tackle grand challenges by its ability to create a common platform for actors with divergent interests. The robust action strategies are also outlined as a significant framework for tackling grand challenges. In the following we will elaborate on the robust action framework and how it is relevant for tackling complex cases through collaborative efforts, such as Matfloken.

Traditionally, robust action can be defined as *noncommittal actions that keep future lines of action open in strategic contexts where opponents are trying to narrow them* (Padgett & Powell, 2012, p. 24). Its origins can be traced back to Eric Leifer (1983, 1991), who applied the term in his analysis of chess players and their strategies (Ferraro et al., 2015). Leifer claimed that the difference between novices and chess masters was not their ability to predict numerous future moves, but rather the ability to plan future moves that support a given strategy, while upholding the flexibility of improvisation based on the opponents moves. Padgett and Ansell (1993) advanced the understanding of robust action strategies, emphasizing the multivocality: “the fact that single actions can be interpreted coherently from multiple perspectives simultaneously, the fact that single actions can be moves in many games at once, and the fact that public and private motivations cannot be parsed” (p. 1263). Several scholars have highlighted that

multivocality is critical in linking robust action and to foster innovation (Furnari, 2014; Hargadon & Douglas, 2001; Padgett & McLean, 2006; Sgourev, 2013). In sum, these research studies highlight how robust action is utilized as a framework across networks, while also cultivating positive collective outcomes, rather than to the benefit of the individual.

We have already presented the three common characteristics of grand challenges as outlined by Etzion et al. 2017, Ferraro et al. (2015) and Gehman et al. (2022). These authors have also outlined three distinct robust action strategies through their robust action framework, which can be found in table 1. These strategies are suggested as an approach to tackle grand challenges. The robust action strategies are *participatory architecture*, *multivocal inscription* and *distributed experimentation*. Together, these strategies may foster novelty through the ongoing, iterative process. Initially, the robust action model was grounded in a pragmatist approach (Gehman et al., 2022). However, the authors later realized that a more radical approach was appropriate. Thus, they argue that embracing a flat ontology is crucial to comprehend the grand challenges. The robust action strategies are considered to be *purposive sets of action undertaken by focal actors* (Ferraro et al., 2015, p. 372).

Strategy	Participatory architecture	Multivocal inscriptions	Distributed experimentation
Definition	A structure and rules of engagement that allow diverse and heterogeneous actors to interact constructively over prolonged timespans	Discursive and material activity that sustains different interpretations among various audiences with different evaluative criteria, in a manner that promotes coordination without requiring explicit consensus	Iterative action that generates small wins, promotes evolutionary learning, and increases engagement, while allowing unsuccessful efforts to be abandoned
Dimension	Structural	Interpretive	Practice
Key characteristics	<p>Facilitate prolonged, meaningful engagement with counterparts</p> <p>Promote coordination and iteration</p> <p>Reduce the risk of disengagement when faced with diverse interests</p> <p>Ensure that no voices are excluded</p> <p>Ensure continuity of actors</p>	<p>Flexible interpretations</p> <p>Tangible artifacts</p> <p>Create a common ground for discussion</p> <p>Fosters more novel solutions</p> <p>Support the inclusion of more stakeholders</p> <p>Ability to generate diverse responses</p> <p>Adopts a broad approach to the problem</p>	<p>Small wins are defined by the participants themselves</p> <p>Small wins can come in different shapes</p> <p>Generates successive larger wins</p> <p>Iteration, repetition, and continuous learning uphold engagement</p> <p>Learning from failures</p>

Table 1 - Overview of extended robust action strategies. Note: Adapted from *Tackling grand challenges pragmatically: Robust action revisited* (p. 373), by Ferraro et al., 2015, Organization Studies.

Participatory architecture is a structural dimension which brings various stakeholders together, both at a certain point in time but also over time (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). As previously mentioned, creating a sustainable food system can be categorized as a grand challenge. The three facets of a grand challenge require the involvement of a vast number of stakeholders (Dietz et al., 2003; Ostrom, 1990). Grand challenges further require a long-term perspective (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022) Accordingly, the robust action framework posits that prolonged engagement is the real challenge, not initial engagement. Ultimately, participatory architecture aims to provide the means for creating the needed structure and stakeholder engagement over time for multi-actor projects, such as Matfloken.

Multivocal inscriptions is considered as an interpretative dimension which allows for collaboration without the need for explicit consensus (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022) To what extent *multivocal inscriptions* can create a change hinges on the ability to substantiate the events into different tangible results. Prolonged engagement does not itself result in action, thus there is a need to create inscriptions such as scripts, routines, norms, and guidelines to guide stakeholders' actions (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). If multiple plausible interpretations can be created, new problems can emerge while including more actors (Beunza & Stark, 2004; Kaplan, 2011). Multivocal inscriptions entail both discursive and material activities. Jointly, these activities promote coordination without requiring explicit consensus, which is particularly relevant for multi-actor projects, such as Matfloken that are characterized by conflicting agendas.

Distributed experimentation emphasizes local experimentation where the focus is not solely on problem-solving but also enhancing the actors problem-solving skills (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). Due to the complexity, uncertainty and evaluative nature of grand challenges, there is no clear solution, yet action is still needed. Iteration, repetition, and continuous learning, based on success and failures, will preserve engagement and sparks further experimentation (Dietz et al., 2003; Simon, 1996). As such, distributed experimentation can generate momentum and thus, potentially encourage larger wins in the long haul.

Jointly, the three robust action strategies can be significant strategies to tackle grand challenges (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). They are considered complementary; thus, it is possible to achieve joint results which would be otherwise unattainable. *Participatory architecture* ensures the necessary structure, the involvement of heterogeneous actors, and creates collaboration across boundaries and time. Even when consensus is hard to obtain, *multivocal inscriptions* can facilitate the discursive and material necessary for prolonged engagement. Together, *distributed experimentation* and *multivocality* enhances prolonged engagement, mitigating the risk of the likely disengagement due to divergent interests and opinions. Furthermore, *distributed experimentation* assures repeated learning and the accomplishing small wins, through both trial and error. By allowing heterogeneous actors to interact, novelty is more likely to emerge, thus fostering further experimenting.

Ultimately, the authors argue that the three robust strategies can be significant strategies for tackling grand challenges (Ferraro et al., 2015; Gehman et al., 2022). The three robust action strategies are interlinked in an iterative process, they become increasingly resilient and adaptive when faced with uncertainty and multivocality. The model does not propose a final solution, but rather emphasizes *repeated participation, inscription, and experimentation, continuously generating novelty and sustaining engagement* (Ferraro et al., 2015, p. 378). This means that the robust action framework does not aim to reach a conclusion but is rather a continuous process that generates novelty.

In the beginning of this section, we outlined how both DT and the robust action framework can be valuable approaches to tackle grand challenges. However, we would argue that the non-committal actions and multivocality set forth by the robust action framework adds an interesting different dimension in the pursuit of solving grand challenges. Both approaches emphasize a structure that enables diversity, iterativity, experimentation and sustained engagement. Furthermore, rather than being perceived as linear steps both approaches have overlapping spaces and strategies (Brown & Wyatt, 2010; Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). However, while design thinking applies a strong user-focus, robust action offers an alternative path to understanding the grand

challenge through multivocality. We would argue that when dealing with sustainable innovation on a system level it is less appropriate to apply the user-focus proposed by DT. As such, the multivocal dimension of robust action strategies may be more valuable for multi-actor projects aimed at tackling grand challenges.

Part III: Methodology

3.1 Introduction

In business research, the most common approach is to choose standardized ways of conducting research and use these as templates for guiding the data collection and analysis (Pratt et al., 2022). However, there are important limitations related to relying on such templates (Locke et al., 2022). Influential scholars (Locke et al., 2022; Pratt et al., 2022) suggest that one should shift from a focus on templates towards uncovering the inner workings of the iterative process that is imperative to qualitative research. Even though it is beneficial for outlining the temporal unfolding of research projects, such formulas inhibit the researcher's ability to iterate as procedures such as coding are understood as a stepwise process. As such, templates can create a perception of a linear research practice, thus neglecting the iterative aspect of the research process. For this reason, we have chosen to not limit ourselves to following a specific template, such as for example grounded theory. We believe that by allowing ourselves to be more flexible, we have been able to stay truer to our data and ensure a more iterative process.

Alvesson and Sandberg (2013) highlights that the most prominent approach to management research is to identify and construct a gap in existing research. This gap-spotting mode is outlined as highly problematic as it rarely leads to influential studies. They further emphasize that there is a need to step away from a one-sided cultivation of consensus-seeking towards cultivating consensus-challenging management studies. As such, we have strived to activate a consensus-challenging mindset by not restricting ourselves to specific theoretical frameworks in the early stages of the process. Furthermore, we have focused on challenging the assumptions and premises made by previous research.

In this chapter, we outline the empirical process. First, we begin by presenting our research context, introducing our case organization Æra Strategic Innovation and the case study project Matflokken. Second, we outline our chosen research design and explain the data collection, where we have interviewed participants in the multi-actor project. Third, we outline our data analysis process based upon

iterative coding. Finally, we consider the ethical aspect of this study, focused on ensuring the protection of our interviewees.

3.2 Research context

The foundation for this master thesis is the collaboration with Æra Strategic Innovation. Æra Strategic Innovation is an independent innovation- and design studio with 19 employees that have sustainability-oriented innovation as a focal point (Æra, n.d.-c). Æra offers services within strategic innovation to clients, and through cross-sectorial innovation projects. The employees consist of economists, designers and social anthropologists and strive towards identifying ways in which business consolidates with societal solutions (Æra, n.d.-c). Æra started the Floke initiative in 2015 after recognizing an urgent need for collaboration across sectors, and common tools to help overcome the immense challenges that the world is facing (Æra, n.d.-a). Floke, which can be translated into grand challenges or wicked problems, are open innovation projects transforming societal challenges into business opportunities across industries and organizations. Thus, Floke are profoundly complex issues that demand cooperation across sectors. Æra has facilitated eight different Floke projects since 2015 (Æra, n.d.-a). In all their Floke projects, they apply the design thinking methodology.

This master thesis will be a case study of the innovation project Matfloken; an innovation project conducted from August 2019 to March 2020, eight months in total (Æra, n.d.-b). The main goal of the innovation project was to identify obstacles and opportunities related to three food-related issues: What we eat, food waste and the food production system. Through this collaboration project a portfolio of ideas to how the issues can be tackled in the future was developed. An important aspect of the project was also to facilitate knowledge sharing, learning and enhanced competencies related to the food industry to equip organizations for future, necessary sustainability-oriented innovation projects. The project resulted in three strategies (Æra, n.d.-b). The first strategy, “From confusion to dialogue”, which encapsulates the need for reducing complexity for the consumers, avoid blameful, doomsday prophecies and rather create credible voices within the industry. The second strategy, “New eating habits for a new era”, addresses the need to empower the consumer with the opportunity to make better decisions related to food. The third strategy, “A market for diversity”, addresses the need to

exploit the potential of Norwegian food production, embrace local production and stimulate a greener development in Norwegian agriculture. During Matfloken, several concepts were developed and experimented on. However, not all concepts were pursued, which we will further elaborate on in our findings.

The project group consisted of 14 representatives from different parts of the food industry in Norway: Tine, Orkla Foods Norway, Nofima, Nortura, Hoff, Millum, Coor, Miljødirektoratet, Landbruksdirektoratet, SiO Mat og drikke, Norsk Landbrukssamvirke, Oslo Kommune Bymiljøetaten, NHO Mat og Drikke and Folkelig (Æra, n.d.-b). The process was managed and facilitated by Æra. Our case study will be based on interviews with representatives from Æra as well as interviews with representatives from the participating organizations.

3.3. Research design and data collection

The project will be a qualitative case study of Matfloken. This strategy is appropriate when the objective is to understand a phenomenon in a context-specific setting, such as a "real world setting where the researcher does not attempt to manipulate the phenomenon of interest" (Patton, 2002, p. 39). Thus, as our aim is to understand the experiences made by the participants in Matfloken, we found case study to be appropriate. The purpose of a case study is to understand the specific topic within its real-world context and thus involve an in-depth inquiry into the complex phenomenon (Yin, 2003). To build the case, we chose to conduct semi-structured interviews.

Initially, we set out to explore the role design thinking played in sustainability-oriented innovation. Accordingly, we aimed to present how the design-thinking methodology can enable sustainability-oriented innovation through a project like Matfloken. After meetings with our co-supervisor, we shifted our focus towards how organizations can develop capabilities and build competence to succeed with SOI in the long term through a design-oriented approach. As such, design thinking became secondary to learning and innovation in practice. This was our starting point when engaging in the data collection. However, we remained open towards different interpretations of our data and thus, did not engage in literature at this point in time.

In terms of data collection, we conducted 12 semi-structured interviews, consisting of six to eight open-ended questions, with additional follow-up questions that enabled us to gain richer answers. These questions aimed to make the interviewees relive their experiences from the project Matfloken. As the project had taken place two years prior to data collection, it was exceedingly important to ask questions encouraging the interviewees to revisit their memories. This was done by explicitly encouraging them to go back in time and reflect. Several interviewees highlighted that they had a hard time remembering but as the conversation unfolded, it became evident that they were able to talk from their experiences and provided rich stories. However, we acknowledge that the long timespan might influence the interviewees' ability to recall experiences and memories. Through the process, we conducted synchronous interviews, both online using Zoom and physical interviews. We acknowledge that there are potential limitations to conducting online interviews, namely technical issues, or unfamiliarity with the video platform. We ensured to schedule extended meetings to combat such pitfalls. The synchronicity of the interviews made the interviews seem more like a conversation about a topic that both parties found intriguing and engaging, and where we focused on having a curious and open approach towards the stories they shared. As such, we created a trusting environment in which the interviewees felt safe, and we were able to capture nuances of their stories. When appropriate, we shared stories told in other interviews to gain more in-depth knowledge and a richer perspective. During every interview, one of us was the main interviewer while the other listened actively and tried to formulate follow-up questions to eliminate ambiguity and gain a deeper understanding of the interviewees' experiences.

The 12 interviewees were sampled through purposive sampling. Purposive sampling emphasizes the research question and is commonly used in qualitative research (Bell et al., 2019). As such, our findings will not be generalizable to a population. By choosing an information-rich case we increase the probability of gathering insights and in-depth understanding (Patton, 2002). There are several strategies which can be utilized to select such information-rich cases. However, the strategies are not mutually exclusive (Patton, 2002). By applying intensity sampling, one increases the chance of collecting excellent or rich examples of the phenomenon in question. Our intention was to gather insight into the experiences

and insights acquired through the participation in a sustainability-oriented project. Thus, we increase the chance of collecting rich data by choosing an organization such as Æra, which arguably can be considered one of the leading firms within the field of sustainability-oriented innovation in Norway. They specialize in strategic innovation, with an emphasis on sustainability (Æra, n.d.-c). As for the case, there were several reasons for choosing Matfloken; First, it is less technical than previous projects requiring less extensive knowledge of design-oriented tools and design expertise. Second, Matfloken had fewer participants, it is a recent project from the year 2020, and more importantly, it was also recommended as a suitable project for our purpose.

When selecting interviewees, we relied on Æra's knowledge of Matfloken and its participants. As such, we have located employees at Æra which have been significant for the facilitation of Matfloken and/or had an important designer role. The participatory organizations were selected based on who had been actively involved in the project while also maintaining a suitable representation of the value chain. Such a strategy is in line with snowball sampling (Bell et al., 2019). We relied on Æra's expertise to identify interesting interview participants. Our intention was to collect an information-rich sample which hopefully would give us further insight into the learning process of the individuals involved in Matfloken. Ultimately, our sample represented individuals from different institutional logics and with differing levels of expertise.

The data collection ran over five phases. The first phase entailed the pilot interviews conducted with two representatives from our case organization, Æra. Both interviewees had been actively engaged in Matfloken. In the second phase, we conducted two pilot interviews with representatives from two participatory organizations. At this point, we had developed two different interview guides for Æra and the participatory organizations respectively. In the third phase, we subsequently conducted six interviews with participatory organizations representing different parts of the food system in Norway. Based on our preliminary findings from the second phase, we revised our interview guide, using less academic and abstract terms to make the conversation flow better and make the interviewees more comfortable. This enabled us to better capture richer stories and made it easier to connect with the interviewees. In the fourth phase, we

conducted the last two interviews with other representatives from Æra. These two representatives had also been actively involved in all phases of Matfloken. Prior to this phase, we had revised our interview guide to comprehend and incorporate the stories that we had learned through all the previous phases.

3.4 Participants

Four participants from Æra participated in this study. These four had different positions within the organization and the innovation project, Matfloken. Even though they have different experiences and competencies within the field of sustainability and innovation, they are all a part of an organization founded upon sustainability as a focal point. Eight representatives from various organizations that participated in Matfloken also took part in this study. Their responsibility and field of expertise varied, which we perceive as a strength for this master thesis, as we were able to capture more nuances through our interviews. Particularly since our final research question centers around the fact that the project consists of participants with partly conflicting agendas and spanning interests.

Table 2: Overview of participants	
Name	Field of expertise
Sarah	Sustainability
Ken	Design
Liam	Project Management
Susan	Design and Sustainability
Olivia	Management
Leo	Marketing
Kate	Product Development
Kevin	Management
Louis	Sustainability
Anton	Research and Strategy
Anders	Marketing
Christina	Innovation

3.5 Data analysis

Through our analysis, we have aimed to work systematically but at the same time allowing for iterativity and tolerate the necessary level of messiness required. As such, we have not pursued inert coding, which would imply that we viewed coding as a static, procedural process (Locke et al., 2015). Following inert coding could potentially have inhibited learning and promoted replication of existing research, thus, potentially activating self-confirming bias by following predetermined codes. Its counterpart, iterative coding, in which practices provide emergent concepts or adjusted or additional questions illuminating specific phenomenon of interest (Locke et al., 2015). Live coding is an iterative form of coding in which coding, codes, and data influence each other, and as such, are interdependent and inseparable. In our master thesis, we have followed an iterative coding approach. As seen in the following, our coding process has been highly iterative and involved a certain degree of “messiness”. We have followed a highly intuitive process, which means that we pursued the next needed analytic input to ensure progression, thus not following any fixed process (Locke et al., 2022). However, we do not consider our process to fully align with live coding procedure since we, in the final stages of the coding, utilize an existing framework to generate codes.

Locke et al. (2022) identifies groups of coding actions which they label *coding moments*. These are *making codes*, *organizing to code*, and *putting patterns together*. In the following, we summarize how our coding process relates to the different coding moments. We have selected the relevant coding actions presented by Locke et al. (2022), however, we have also added additional coding actions, which was relevant for our coding process.

The data analysis consisted of multiple steps: The first step was to conduct an overarching, open coding process which resulted in 10 categories. When making these codes, we drew solely on data as a source of ideas and labels. When organizing to code, we used prior analytical artifacts (Locke et al., 2022), such as memos and lists to structure and shape the 10 generated codes. At this stage, we did not constrict ourselves to a single theoretical framework. During the initial phases, we were uncertain of the direction and which theoretical frameworks we would apply. We found the uncertainty quite frustrating due to a lack of a

structure, and particularly since it was upheld through the first phases of the process. However, as the coding process unfolded, we were better able to see and discuss the relation among data, codes, and ideas. Further, we drew on existing literature and realized that design thinking emerged as a more secondary perspective since our findings did not go beyond existing research.

The second step of our data analysis represented a vital shift in our research process, as we realized that the multi-actor perspective was lacking in our theoretical foundation. This was further supported during our meeting with our supervisor. We shifted our focal point from the individual participatory organization towards the multi-actor project Floke. As such, we explored the literature on robust action strategies more in-depth. Additionally, we discovered a potential for extending the robust action framework. With this in mind, we restarted the coding process by drawing on the literature, generating four categories based on the robust action framework. Three of our codes were based on the robust action strategies derived from the literature on the field: *Participatory architecture*, *multivocal inscription* and *distributed experimentation*. As such, we used the existing definitions when analyzing our data. When putting patterns together (Locke et al., 2022), we juxtaposed patterns across our data and the selected theoretical framework, thus creating a fourth category, participatory contract.

The third step involved making codes by revisiting the data to refine the prior made code (Locke et al., 2022), participatory contract. In this process, we discovered that the category was too broad. Through revisiting our data and the theoretical framework, we conceptualized two additional new categories, *robust meaningmaking* and *shared system understanding*. These categories emerged because we realized that there was a general lack of emphasis on meaningmaking and the system perspective within the robust action framework.

The last step was characterized by refining our codes and juxtaposing patterns across data (Locke et al., 2022). As we adjusted our new categories through discussion, we simultaneously redefined our understanding of the existing robust action strategies. Thus, we revisited our data to better fit our redefined conceptualization of the robust action strategies. To better conceptualize the

linkages between our final five categories, we developed a figure, which we later refined.

Ultimately, we experienced the coding process as both iterative and “messy” as we shifted our focus several times, and continuously redefined our codes and our understanding of them. A highly beneficial part of our coding process was the long timespan. When making codes, we did not stress the process but rather kept a long-term focus, thus ensuring a deeper and richer understanding of our codes and the theoretical framework. Therefore, we consider the maturing process as an additional and important coding action. Another important aspect of our process was the fact that the coding always occurred as a collective process. This implies that we never coded individually, but rather that it was executed as a collaborative process. This resulted in continuous discussions, which strengthened our understanding of our data and our codes. Furthermore, our independent approach to theory allowed us to cultivate a consensus-challenging mode throughout the process. This resulted in two additional categories that both challenge and extend the existing robust action framework. In order to increase the robustness of our findings, we engaged in conversations with our supervisor and co-supervisor. The purpose was to allow them to elaborate and verify our categories and findings.

3.6 Ethical considerations

Certain ethical considerations were made during the process of writing this master thesis. Particularly, considering the handling of the participants’ personal information. First, we submitted a formal and required application to the Norwegian Center for Research Data (NSD), which has been approved. Second, all participation was voluntary, and we ensured anonymity by not disclosing names of interviewees or the names of the participatory organizations. Prior to the interviews, a letter of information and a declaration of consent was e-mailed to the interview objects to provide sufficient information about the purpose of the interview. This document entailed information about the research project, the rationale behind selecting them as participants for the specific study, and how the information would be handled during and after the master thesis process. The participants were also allowed to withdraw from the project at any time and were not asked to provide sensitive information or information about third parties. The

recordings, the transcripts and the codes are safely stored. Finally, in accordance with NSD's guidelines, all personal data will be deleted post grading.

Part IV: Findings

4.1 Introduction

Through our analysis, we found the Robust Action framework to be applicable to the experiences and statements of our interviewees. In addition to the authors' definition of the three robust action strategies; *participatory architecture*, *multivocal inscriptions* and *distributed experimentation*, we have created our own key criterias to analyze Matfloken. These can be found in table 3 along with definitions of the extended framework. Further, through our analysis, we found that the robust action framework lacked an underlying supportive structure which we have labeled *towards a system understanding*, comprising *robust meaningmaking* and *shared system understanding*. In addition, we discovered that the original robust action strategies to some extents were cultivated through Matfloken, yet some challenges are highlighted. In table 4, we present the benefits and challenges related to the extended robust action framework found in our data.

Strategies	Definition	Key evaluation criterias
Participatory architecture	The structure that supports iterative interaction between heterogeneous participants, where the aim is meaningful prolonged engagement over time.	The structural dimension Diversity Composition of actors Continuity of actors Mandate and authority Level of trust
Multivocal inscriptions	Discursive and material activity that sustains different interpretations among various audiences with different evaluative criteria, in a manner that promotes coordination without requiring explicit consensus.	Broad or narrow process Tangible artifacts (i.e., material activities) Shared narrative of concepts, insights and terminology (i.e., discursive activities)
Distributed experimentation	Distributed experimentation refers to the iterative action that results in small wins through participatory engagement.	Small wins Iteration, repetition and feedback Learning from failures

**Underlying supportive structure:
Towards a system understanding**

Robust meaningmaking	Anchoring and facilitating an ongoing inquiry about higher purposes and a sense of meaning through a collective process – to be cultivated and revitalized in the long term.	Experienced meaningmaking Navigating conflict through meaningmaking Organizational meaningfulness
Shared system understanding	A fundamental shared understanding of systems building that allows for working towards a higher purpose. This shared understanding evolves over time.	Moving beyond the organization as a focal beyond Incremental or radical changes The evolvement of system understanding over time

Table 3 - Overview of extended robust action strategies. Note: Adapted from *Tackling grand challenges pragmatically: Robust action revisited* (p. 373), by Ferraro et al., 2015, Organization Studies.

Strategies	Benefits	Challenges
Participatory architecture	Having heterogeneous actors to some extent while accomplishing a high level of trust, which ensures meaningful prolonged engagement. Thus, creating potential for novelty to emerge.	Having a frequent turnover threatens the trust which has been built up. A lack of diversity in the project threatens the possibility for novelty to emerge. Ultimately, both aspects create setbacks for progression.
Multivocal inscriptions	Even when consensus was hard to obtain, physical artifacts annotated the process, as such uniting the participants and creating agreement about the development in each phase. Thus, contributing to prolonged engagement.	The inability to uphold the multivocality regarding the fundamental terminology “sustainable food” threatens sustained engagement.
Distributed experimentation	Generated both tangible and intangible small wins, which may encourage larger wins in the long haul. Thus, generating momentum and continuous development.	The Covid 19 pandemic caused a significant loss of momentum.
Underlying supportive structure: Towards a system understanding		
Robust meaningmaking	The participants experienced individual meaningmaking.	The conflict indicates that the participatory organizations lacked a coherent shared meaning. There was a friction between the individuals’ experienced meaningmaking and organizations meaningmaking.
Shared system understanding	The ambition behind the project was to create system change. Shared system understanding seemed to be maturing over time through increased knowledge and collaboration.	The participants were mostly focussed on return on investment and new profitable products. There is an unwillingness to change the profitable system. The concepts developed are merely incremental innovations.

Table 4 - Overview of the extended robust action framework in relation to Matfloken

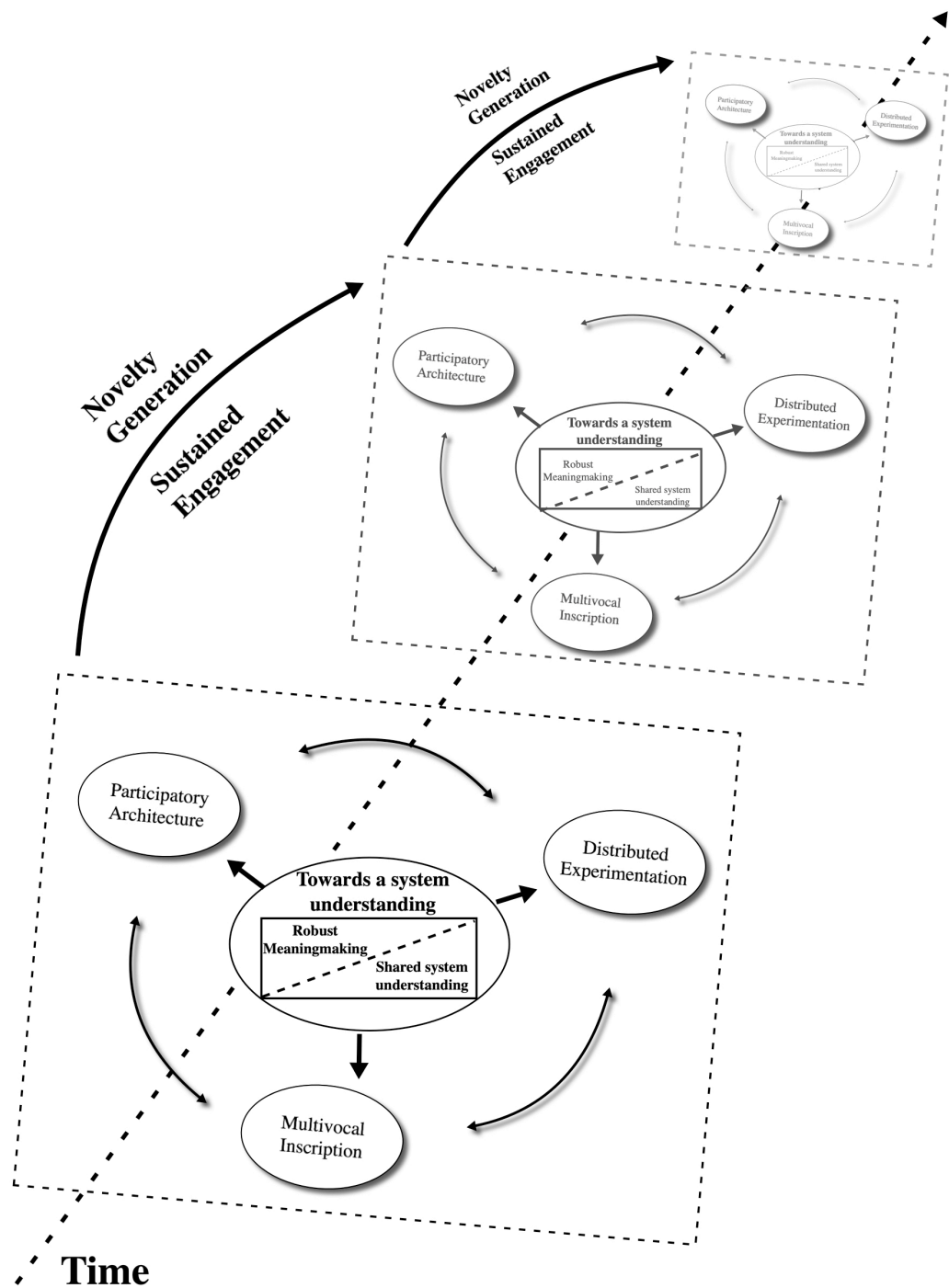


Figure 1 - Overview of extended robust action strategies. Note: Adapted from *Tackling grand challenges pragmatically: Robust action revisited* (p. 379), by Ferraro et al., 2015, Organization Studies.

We offer an extended theoretical model which incorporates both the new contributions and the original robust action strategies, and the linkages between them. Fig. 1 outlines the extended theoretical model of robust action strategies. We have extended the model with an underlying supportive structure, labeled *towards a system understanding*, comprising *robust meaningmaking* and *shared system understanding*. First, we consider it to be beneficial to facilitate *robust*

meaningmaking in such a multi-actor project. By *robust meaningmaking*, we refer to anchoring and facilitating an ongoing inquiry about higher purposes and a sense of meaning that should be cultivated and revitalized in the long term. This does not imply that the sense of meaning should be defined prior to the project, but rather that it can be discovered and redefined as the project unfolds. Second, by *shared system understanding*, we refer to a fundamental shared understanding of systems building that allows for working towards a higher purpose. This implies that a system is more than simply the sum of its parts, as such it is not sufficient to examine the parts in isolation. Such an understanding of system complexity makes it easier to identify the levers for change. Further, we consider this systemic understanding to be evolving over time as the project unfolds. One could imagine that cultivating robust meaningmaking over time could evolve into a fully shared system understanding. We would argue that *robust meaningmaking* and *shared system understanding* creates a stronger foundation for tackling grand challenges. *Shared system understanding* makes a particularly important contribution by highlighting that a system is more than simply the sum of its parts, as such it is not sufficient to examine the parts in isolation. However, as it is difficult to achieve a *shared system understanding*, *robust meaningmaking* can function as a starting point that may guide actors towards a more fully shared system understanding.

These two underlying supportive structures should be considered as intertwined, and not mistaken for being two single entities. It is vital to facilitate meaningmaking that allow actors to look beyond the individual organization, which ultimately may lead to a fully cultivated shared system understanding. We would argue that the current robust action framework allows actors to pursue individual goals. However, we posit that when tackling grand challenges, there is a need for the underlying supporting structure that guides the actors towards a system understanding. The respective underlying structures are also interlinked with the other, respective robust action strategies. *Robust meaningmaking* and *shared system understanding* provides a fundamental sense of higher purpose that facilitates prolonged engagement and contributes to navigating conflicts that may occur due to the heterogeneous *participatory architecture*. Furthermore, the two underlying structures ensure that while maintaining the *multivocal inscription*, the actors can move beyond individual gains. As for *distributed experimentation*, a

robust meaningmaking and *shared system understanding* will provide a clearer direction while also ensuring a higher level of radicality.

Our extended model of robust action strategies show that the strategies and underlying structure will evolve over time, which is in line with the robust action framework. As the original theoretical framework, we consider all aspects to be intertwined and interconnected in an iterative and dynamic, continuous process. In our Fig.1 of the extended robust action model, we illustrate the interconnectedness, by positioning the two additional subcategories in the middle. By adding these additional categories, we perceive the model to be more robust and adaptive while possibly enabling more radicality and system transformation.

In the following, we will present evidence for the extended robust action framework, as well as evidence that supports the existence of the three original robust action strategies. The three initial robust action strategies will be analyzed using the existing robust action framework, as such, drawing on theory while also incorporating our own evaluative criterias. When we present our contribution to the framework, we draw on our findings, which will later be supported by applying existing literature. Ultimately, we will outline how robust action strategies are intertwined and how time, complexity and novelty impact the multi-actor project.

4.2 Participatory architecture

In table 3, we outline the definition of *participatory architecture*, referring to it as a structure that supports interaction between heterogeneous participants, where the aim is meaningful prolonged engagement over time. To evaluate how participatory architecture comes into play in Matfloken, we will apply the key criterias outlined in table 4. Given the aim of Matfloken to foster long-term engagement, we will evaluate the structural dimension of the project.

Furthermore, as Matfloken is a cross-sector collaboration project aimed at achieving radical solutions, we consider it as vital to evaluate the representation of diverse actors and the composition of these. As this long-term engagement is vital to achieve radical solutions, we will also evaluate the extent to which continuity was upheld. Additionally, through our data, we discovered important elements that can further strengthen the *participatory architecture* and cultivate prolonged

engagement over time, thus extending the definition of the strategy. We have identified mandate and authority as well as trust to be vital to ensure prolonged engagement and to ensure the possibility of reaching a level of radicality in innovation projects.

The structural dimension of Matfloken

The multi-actor project, Matfloken, has different structures that impact the process, such as the methodology as well as the prescription for the expected evolution of the Floke process. The latter has been adjusted with time and experience. During our iterative coding process, it became evident that “riggen” was used by the facilitators as an umbrella term for participatory architecture, as the next interviewee highlights. Furthermore, the facilitators themselves, Æra, admit that they have not yet discovered the optimal “rigg” for projects such as these. As Ken, a representative from Æra explains:

“So, we need to create a “rigg” that allows for both, that is, that you can let participants who want to work together do that, but also take into consideration who should work together, or at least have a dialogue. Maybe we should have tweaked it, that is, spent more time internally to decide who should be connected. Or if we should have had a longer discussion with the participants themselves to decide who should work with whom ... We had sort of established the groups for concept development, but they were also allowed to move around if they disagreed or found a better fitting concept. Maybe we should have done that “rigg” differently.

Furthermore, through our data, we found that both the project description and the innovation brief aimed to create the necessary structural dimension for Matfloken. As such, this innovation brief aims to function as an anchor for the structural dimension of the project. As Sarah explains:

The take-off is important, so the project description is critical. It tells us what the Floke is and what direction we are exploring. And the innovation brief is important. I think that phase is critical as it is our starting point. It tells us how high to jump and in which direction.

Through these stories we see that there are some structural elements in place. It is important to note that the structural dimensions mentioned are not an exhaustive list. Rather, we have emphasized the elements highlighted by the interviewees. Looking to literature, participatory architecture aims to create a structural dimension that fosters long-term engagement and enable heterogeneous actors to collaborate (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). Such structural elements become the “rules of the game”, thus allowing actors with highly different perspectives and interests to meaningfully interact over time (Ferraro et al., 2015). As such, the structural dimensions, and rules of engagement in Matfloken can influence the interaction and action throughout the process.

Diversity and composition of actors

Given the aim of Matfloken to foster cross-sector collaboration to achieve radical innovation on a system level, a representation of diverse actors over time is vital. On a purely practical level, we have therefore evaluated the level of diversity and continuity of actors in the multi-actor project. The multi-actor project consisted of diverse actors, including private, public, voluntary and interest organizations as well as a research institute. The value-chain was mainly represented through producers, conglomerates, facility management and service companies, as well as stakeholders representing important voices within the food system in Norway. As Kevin elaborates:

It is vital to have a representation of various voices and perspectives to capture the value chain as a whole ... In my opinion, they were able to include various actors from both public, private, and voluntary organizations. It is also important for the learning process. Otherwise, you get an echo chamber if one part of the value chain is represented.

Even though some participants mentioned that the representation of the value chain was sufficient, others point that there could have been more diversity and that vital parts of the value-chain were not represented in Matfloken. As Kate explains: “It would have been cool to include the grocery chains in the project”. Sarah further highlighted that “We should have included Gartnerhallen or Bama”. Some highlighted that it is not simply the diversity of participants which is vital, but also the diversity of representatives within their own ranks. As Olivia reflects:

You need to include people from the production line, buyers, i.e., broader competence. You need to include some seniors ... The disadvantage is that you might get some people who function more as brakes, but the knowledge they have is important. The facilitators need to be able to identify and explore this knowledge.

As these stories show, including additional participatory organizations and increasing the number and diversity of the actors from each participatory organization can contribute to strengthening the multivocal inscriptions. This is aligned with the literature, as Ferraro et al. (2015) that the greater the complexity of a specific grand challenge, greater diversity amongst stakeholders is needed. By allowing even more heterogeneous actors to interact, novelty is more likely to emerge, thus fostering further local experimentation.

Continuity and trust

As outlined above, Matfloken aims to foster cross-sector collaboration to achieve radical innovation on a system-level, thus, engagement over time is vital. For this reason, we have evaluated the level of continuity of actors in the multi-actor project, which was one of the most prominent challenges that the project faced. It was highlighted by representatives from Æra that the lack of continuity of actors was particularly an issue. Some changed jobs while others were relocated internally in the firm, and as such, did not complete the process. Furthermore, some participatory organizations abandoned the project. As Anton highlights:

Organization X stopped showing up to the meetings after a while. They just did not show up. I felt that he did not feel accommodated. Maybe he felt that it would not lead to anything, I do not know.

As we outlined in our extended understanding of participatory architecture, trust is perceived as vital for ensuring prolonged engagement. When actors are diverse and have different perspectives on the issue at hand, it increases the need for having a strong foundation based on trust. This is vital because it enables participants to interact more openly over time and as such increases the probability of novel solutions to emerge. Thus, we evaluated the extent to which trust can emerge. As Anders explains:

I was impressed by the level of cooperation achieved, and the fact that we had such an open dialogue as well as transparency between the participants... At work, one tends to think in silos...To be able to increase transparency is a good thing, but it is more demanding. It is demanding because you need to know the limits. What you can disclose and not. And what you can share and not. It is not a free flow, that is impossible.

As such, despite the divergent interests, the participants were able to reach a level of trust and an open dialogue, which we consider as highly important in such innovation projects. Because of the frequent replacement of actors, however, several related challenges arose, such as threatening the established level of trust and openness, as Ken, a representative from Æra explicitly highlights:

What was critical was the replacement of participants which occurred along the way... Suddenly, another person arrives, who does not know that person, and then you realize that a lot centers around personal dynamics, that you are able to facilitate the process and create a space for trust to emerge ... As we learned through that process as well, that we must be even more clear regarding the roles which the participants chose to include in the process, that we have to clarify that these roles or people need to be consistent in the organization, it is essential for “riggen” to survive. So that is something we learned that we must be better at ensuring that the people who are included in the project have the capacity and the desire to stay throughout the entire process.

Due to the frequent replacements, this structure was threatened and thus caused long-lasting repercussions for the project. As Sarah highlighted:

And what happened was that the new participants were those who disagreed on the brief. So really, it was supposed to be other people from the organization, but they were replaced at the last second. It seemed that they had not been properly onboarded by their colleagues, they did not know what this project was about.

One can argue that the frequent replacements of actors ultimately disrupted the level of trust, flow and iterativity in Matflokken. As such, one can wonder if more radical ideas could have emerged if it were not for the frequent interruptions taking the attention away from the creative process. This is aligned with the

literature, as a key challenge for such multi-actor projects is to prevent premature termination to sustain engagement (Ferraro et al., 2015)., Gehman et al. (2022) emphasizes that it is imperative to uphold engagement over time and allow diverse actors to interact constructively over prolonged time spans. Particularly, since grand challenges require a long-term perspective, the participatory architecture must ensure that heterogeneous actors engage in a series of interconnected events, thus setting in motion a continuous process.

Mandate and authority

Given the aim of the multi-actor project, we have also identified mandate and authority to play an important role when it comes to ensuring the possibility of reaching a level of radicality in innovation projects. Through our analysis we therefore identify whether the actors had the proper mandate and authority as a decision-maker representing each participatory organization. Anders reflected as such:

My organization has been very supportive of my involvement in this project. I was sort of appointed to this mandate, and they trusted my decision-making. Choices needed to be made throughout the process ... What is important to you? What is important to our organization, from my perspective?

One representative from Æra highlights the importance of ensuring that actors have the proper mandate and authority to engage in more system-oriented innovations and to ensure that the chosen concept is further developed after Matfloken is completed.

Evaluating the overall participatory architecture in Matfloken

Overall, we learned through our data that Matfloken to some extent fulfills the criteria of participatory architecture. As these stories show, it is important to have a structural dimension to ensure sustained engagement. However, one can question whether the structural dimensions were sufficient in this situation due to the complex nature of this particular project. The project consisted of heterogeneous and diverse actors, yet it is highlighted that certain actors were missing. Even though the group consisted of diverse actors, they managed to gain a certain level of trust. However, the frequent turnover impacted this established

trust and the dynamics of the group as well as created setbacks for progression. As Æra admits, there is a need for refining the existing “rigg”. We would argue that this could increase the potential for novelty to emerge and foster more experimentation. Looking at the literature, *participatory architecture* creates a foundation by initiating structure and ensuring the involvement of heterogeneous actors, which enable long-term engagement (Ferraro et al., 2015). However, it is important to note that all the three robust action strategies are complimentary; thus, it is possible to achieve joint results which would be otherwise unattainable. As such, participatory architecture in isolation will not be sufficient to tackle the complex grand challenge at hand.

4.2 Multivocal inscriptions

In table 3, we outline the definition of *multivocal inscriptions*, referring to it as inscriptions that consist of discursive and material activities that can be interpreted flexibly. To evaluate how multivocal inscriptions come into play in Matfloken, we will apply the key criterias outlined in table 4. Given the aim of Matfloken to create radical solutions through collaboration with diverse actors, *multivocal inscriptions* can facilitate the discursive and material activities necessary for prolonged engagement even when consensus is hard to obtain. This implies that effective multivocal inscriptions in multi-actor projects must be able to sustain an array of different evaluative criterias and as such promote coordination. We define material activities as the tangible annotations which ensures that the development of the project is not erased but documented. We define discursive activities as the shared understanding of the terminology and insights derived throughout the process. We will demonstrate how the tangible artifacts (i.e., material activity) impacted the multi-actor project. When we evaluate discursive activities, we evaluate whether actors have developed a shared narrative of concepts, insights, and terminology, thus extending the definition of multivocal inscriptions. This understanding of discursive activities goes beyond what we have derived from literature as discursive activities are not explicitly explained by the authors behind the robust action strategies. The discursive activities that will be evaluated through our analysis is the meaning and understanding of the term “sustainable food”. Furthermore, we evaluate whether the process was interpreted as broad or narrow.

The impact of tangible artifacts

Through our interviews, we discovered that the interviewees frequently mentioned and referred to tangible artifacts developed throughout Matfloken. As Louis put it: “It is sort of a library, the book we received: A plate of possibilities. A sort of library of possible concepts to develop further. So, when the timing is right, it is easy to find the book”. Furthermore, interviewees also highlight different artifacts, such as the innovation brief, posters and post-it notes. Some interviewees even revisited the artifacts during the interview. Furthermore, Christina stated that:

I was really fascinated by the fact that they designed this small book that we could scroll through ... This physical proof, even though it had a cost, and it left a footprint, made it more difficult for people to go back and say that something should have been done differently. It made us truer towards the process. Also, when you have that book it is simply easier to find information than going into a sharepoint file. It was designed in a user-centric manner so that you could easily send it to other companies. It sorts of lived its own life. By adding these 5-10 percent extra resources, it became a complete delivery adding great value.

Leo highlights how the material activities were generated throughout the innovation process, which further enabled them to create a direction for the project. He explains:

There are a lot of different processes going on here. The insights phase with all the small insights and everything was combined into key insights and then we proceeded to think about how we could use it. How can we put it together to create a suggestion for a direction or project?

These outlined physical artifacts enabled the participants to more easily absorb all the new information and insights. As such, it became a physical proof of each phase, thus preserving the process. These artifacts annotated the process in such a way that it united the participants and created agreement about the development in each phase. This is aligned with the literature which states that such material activities can guide action and behavior *if* they allow for flexible interpretation (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). Further, the tangible artifacts have the potential to promote the necessary coordination between the heterogenous participants, even when consensus is hard to obtain. It

is important to note that we do not consider this to be an exhaustive list of physical artifacts, but rather the artifacts emphasized by the interviewees during our interviews.

Shared narrative of concepts, insights, and terminology,

Despite the sufficient level of material activities in Matflokken, *multivocal inscription* requires discursive activity that sustains different interpretations of the terminology “sustainable food”. Through our interviews, we discovered that the actors voiced different perceptions of “sustainable food”. Several interviewees voiced that they realized that there is no definite answer to *what* sustainable food is. Rather they learned *how* to navigate and discuss the conflicted subject. Some shared that they perceived the discursive activity as being open for interpretation. As Leo elaborates: “We learned that “sustainable food” is not clear-cut, you yourself need to extract the most valuable information”. Susan highlighted: “We do not necessarily have to agree. We do not have to share the same views and opinions. But we must somewhat agree on what we are actually dealing with”. These stories demonstrate that the discursive activity to some extent allowed for multiple, plausible interpretations.

Even though some of the actors had developed a shared narrative of the terminology, we discovered that there were challenges relating to the discursive activity. One of the challenges was the inability to fully capture the multivocality of the term *sustainable food*. This implies that some experienced the process as somewhat narrow and not able to capture the various perspectives of the participatory organizations. As a result, a few participatory organizations chose to exit before project completion. As Olivia explains: “I got in the middle of this process that led to conclusions which I did not approve of ... So, I was not very present in the remaining half of the project”. The fact that some participatory organizations chose to leave the project, automatically resulted in less flexible interpretations. As such, we argue that the process became narrower than anticipated by the robust action strategies. As one interviewee states: “It was not always transparent how we achieved our results. Æra did a lot backstage. So, it was not always clear what happened.” Furthermore, Æra acknowledges that they themselves influenced the process:

Hundreds of ideas emerge from our idea workshops, then we can consider these ideas here (editor's note: backstage) after the workshop and filter out half of them because they are bad ideas. That is how we can control the process. That is how we increase the quality of the deliveries and prime the group. It is not that we have all the answers in advance and just want to foster our own ideas, that is not what I mean, but we quickly realize what is a bad idea and does not fit with the Floke process. Often ideas emerge that do not belong. So, balancing being a facilitator and having an opinion, is what we can do backstage. This works 90 percent of the time, 10 percent of the time it backfires, and we have forgotten an idea. Which usually works out well. But it is of course a bit risky, since we ask for opinions from the group and then we do not follow up. So, people can feel that something is missing, but that is where we mean that you have bought a product from Æra as process leaders, thus you need to trust that we know what we are doing. Because we do this every day.

Furthermore, Sarah states that some participants felt that their perspectives and voices were not sufficiently included in the process: "You should not silence people's perspectives. But I remember that in the first workshop, there was one person who said "this is not the correct brief. I cannot recognize our perspective in this brief"". Several interviewees highlighted that some conclusions had been made early on without considering other alternatives. Therefore, one can question whether such a facilitation practice might make the distributed experimentation narrower. However, we learned through the process that Æra perceived their involvement as necessary to ensure progress and radical innovation. It is also important to keep in mind the short timeframe of the Floke projects and the complexity of this particular Floke. As such, one can argue that a certain level of influence was necessary to ensure progression even though it is not in line with the robust action framework per se.

Looking to the literature, with the Brundtland report it became evident that to create the link between environment and development, it was important that sustainability as a concept could be interpreted in a vast number of ways (Robinson, 2004). Ultimately promoting additional engagement and a common ground for discussion (Sneddon et al., 2006). We argue that the same argument can be made for "sustainable food" in Matfloken. As such, multivocal inscription may facilitate collaboration within and between the multiple participatory

organizations in the project, without a need for explicit consensus (Bechky, 2003; Bowker & Star, 1999; Mody & Nelson, 2013).

Evaluating the overall multivocality in Matfloken

Overall, we learned through our data that Matfloken to some extent fulfills the criteria of *multivocal inscriptions*. Even when consensus was hard to obtain, physical artifacts annotated the process, thus uniting the participants creating agreement about the development in each phase. This may have contributed to prolonged engagement. This multivocality provides to some extent a common ground for discussion, which is vital when dealing with such complex and evaluative challenges (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). However, the inability to capture the multivocality of the terminology threatens the sustained engagement as participants chose to exit the project, possibly silencing contradicting voices. Drawing on literature, *multivocal inscriptions* does not crumble under scrutiny but rather resists repeated probing by diverse actors that hold different perspectives and interests (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). Furthermore, multivocality stresses the importance of preserving the diversity of voices and divergent opinions to foster *distributed experimentation* (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). Due to the complex and evaluative nature of grand challenges, it is vital to have *multivocal inscriptions* that can capture the vast perceptions and opinions while not silencing any contradictory voices (Ferraro et al., 2015). Therefore, we consider that the inscriptions in the multi-actor project, Matfloken, did not fully allow for multiple and flexible interpretations, thus potentially hindering novel solutions and the inclusion of diverse stakeholders. However, considering the short timeframe one can question whether it was in fact necessary to make multivocality narrower to ensure progression. Sustaining the engagement of heterogeneous participants as well as ensuring multivocality is not sufficient to create novel and radical innovation (Etzion et al., 2017), one also needs experimentation.

4.3 Distributed experimentation

In table 3, we outline the definition of *distributed experimentation*, referring to the iterative actions that result in small wins through participatory engagement. To evaluate how distributed experimentation comes into play in Matfloken, we will apply the key criterias outlined in table 4. Given the aim of Matfloken to create

novel and radical solutions, it is necessary to engage in local experimentation; thus, allowing novel solutions and new pathways to emerge in complex projects. For this reason, we evaluate the extent to which the participants can achieve small wins through discussions and experimentation. We have also considered the amount of iteration, repetition, and feedback, and to what extent the participants were able to learn from their failures. Ultimately, the momentum of distributed experimentation is likely to have repercussions even after the project is finished.

Small wins

Through our interviews, we identify several small wins. Small wins can take many forms, such as for example concrete concepts that were realized. Food Revolution is an example of one concept that was fully pursued after the project was finished. The concept of Food Revolution is a collaboration between four of the participatory organizations, where the aim is to create a platform for testing plant-based products through collaboration between producers of sustainable products and providers of food service avenues. Thus, producers are better able to make plant-based products that are tailored to customer's needs. Furthermore, it was highlighted that the group behind Food Revolution were particularly successful in their teamwork; thus, also constituting a small win. As Ken highlights: "Food Revolution was exemplary. The group was highly engaged in the concept they had developed, and they had a good group dynamic. They also had the time and resources internally to follow up." Based on this statement, one can wonder if Food Revolution became such a success due to the excellent team dynamic and the prolonged engagement. Furthermore, other interviewees highlighted other small wins such as gaining increased first-hand knowledge about the consumers. This was particularly helpful since it allowed them to interact and gain insight directly from the consumers which had a significant impact on their later sustainability efforts.

Other small wins were less tangible, as Susan explains: "I think the most important accomplishment was the implementation of a new mindset. And a new approach to sustainable innovation. To be honest". Susan, a representative from Æra further elaborates on the design thinking methodology: "We have developed a methodology that forces them to take a different perspective. And that might be the strongest experience for most of them", thus, functioning as a small win in the

process. Furthermore, it is evident that the actors have gained an extended network and new social relations, thus enabling them to reach out to each other more easily. Such a small win can have long-term repercussions as it enables further collaboration and knowledge sharing. Overall, the examples illustrated show that small wins can take many different shapes. Ultimately, they all have the potential to contribute to generate momentum that might make larger wins more attainable. Literature emphasizes that momentum is created by the small wins accomplished; thus, fueling more debates and experiments (Etzion et al., 2017).

Momentum and long-term repercussions

An interesting feature with Matfloken is its ability to generate momentum and continuous development and thus, potentially encourage larger wins in the long haul. Some concepts were immediately realized while others' ideas "are stored in the backpack for later", as Louis reflects. Thus, ultimately, the momentum of *distributed experimentation* is likely to have repercussions even after the project is finished. These repercussions can be hidden or difficult to measure. Sometimes organizations must go through a process of maturation before being able to take the idea further. An example of such repercussions is the plant-based restaurant concept Såd, a product conceptualized after taking part in Matfloken. As such, it was not a concrete concept derived from the process, but rather a long-term repercussion.

Some interviewees highlighted that the momentum was threatened by the Covid-19 pandemic, as the final phase of the project was hampered by the infection control measures. Usually, each Floke project is concluded with an event where participating organizations and other relevant stakeholders are present. The cancellation of this event inhibited new actors from becoming involved or following up on unrealized ideas. Looking to the literature, momentum has the potential to generate interest among various stakeholders and as such, support the inclusion of additional stakeholders (Etzion et al., 2017). As such, the pandemic caused a significant loss of momentum and power, eliminating an important opportunity to further involve new stakeholders that could have contributed to solving the grand challenge.

Iteration, repetition, and feedback. Through our data, we evaluated the amount of iteration, repetition, and feedback. Kevin highlighted that the process of generating ideas was too swift, from coming up with an idea to choosing which idea to pursue:

I wish there would have been more focus on the idea generation process in the second phase. That we could have had several rounds of brainstorming. Or spent more time. It is not like it is always appropriate to spend so much time on the idea generation process. But in my opinion, it went a bit too fast from coming up with ideas to selecting an idea.

Thus, we would argue that there could have been a greater degree of iteration, repetition, and feedback in the stages after the idea generation. Another interviewee put forth an interesting approach to improve the structure of the project as he noted that the 8-month long process was too fragmented. Thus, risking losing rich discussions and insights due to a lengthy process. He suggested including one or more innovation sprints in the multi-actor project. One can reflect upon whether this would be a valuable addition that would ensure more iteration, repetition, and feedback. Looking to the literature, Etzion et al. (2017) emphasizes the importance of allowing for a high degree of iteration, repetition, and feedback during such a process to ensure prolonged engagement and pursue further experimentation.

Evaluating the overall distributed experimentation in Matfloken

Overall, we learned through our data that the participants were to a large extent engaged in distributed experimentation. Aera were particularly skilled in facilitating the process. The project generated both tangible and intangible small wins, which may encourage larger wins in the long haul. Looking to the literature, when dealing with such complex, uncertain and evaluative challenges, several solutions will emerge and as such, it is not clear from the beginning how to best proceed (Ferraro et al., 2015). These small wins offer an opportunity to enable participants to pursue successive, larger wins in the long-term (Etzion et al., 2017). As such, generating momentum and continuous development. Furthermore, even though Covid-19 created a loss of momentum, one can argue whether this unrealized potential would be realized regardless. As Sarah, a representative from

Æra states: “There is never a right time for the kind of innovation we wish to accomplish”.

The interconnectedness of the robust action strategies in Matfloken

Looking to the literature, *participatory architecture* ensures the necessary structure, the involvement of heterogeneous actors, and long-term commitment (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). Even when consensus is hard to obtain, *multivocal inscriptions* can facilitate the discursive and material necessary for prolonged engagement. Together, *distributed experimentation* and *multivocality* enhances prolonged engagement, mitigating the risk of the likely disengagement due to divergent interests and opinions. Furthermore, if all the three robust action strategies are in place, they have the potential to complement and further strengthen each other (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). They can become increasingly resilient and adaptive when faced with uncertainty and multivocality: thus, making it possible to achieve joint results which would be otherwise unattainable. Based on our findings, we would argue that the multi-actor project, Matfloken, to some extent is not fully able to achieve this complementary effect. This implies that the multi-actor project and outcomes did not reach its full potential. However, we must bear in mind that robust action strategies call for a process of repeated participation, inscriptions, and experimentation to generate novel solutions (Ferraro et al., 2015). This is arguably hard to achieve for a project with such a short time frame.

4.4. Extended framework: Towards a system understanding

As outlined above, we offer an extended theoretical model which incorporates both the new contributions and the original robust action strategies and the linkages between them. We have created one umbrella term, *towards a system understanding*, comprising two subcategories, *robust meaningmaking* and *shared system understanding*. The main category, *towards a system understanding* provides a fundamental common direction for the multi-actor project.

4.4.1 Robust meaningmaking

Through our data it became evident that Matfloken through its purpose “What will tomorrow's meal look like?” is able to foster meaningmaking. This overall purpose strives towards creating a long-term change in the food system, focusing

on both improving public health as well as ensuring that the food system is aligned with nature's premises (Æra, n.d.-b). This ambitious purpose can ignite a spark of hope and optimism amongst participant and participatory organizations. As such, we would argue that the current robust action framework lacks the focus on robust meaningmaking. We have therefore added the additional subcategory, *robust meaningmaking* which we will elaborate on in the following. Our definition of the first additional category is as follows: Anchoring and facilitating an ongoing inquiry about higher purposes and a sense of meaning through a collective process – to be cultivated and revitalized in the long term.

On a practical note, this would involve creating a sense of meaning, in which all participatory organizations can interpret flexibly to align with their own perspectives and interests. By having this shared purpose, the focus goes beyond the individual organization, thus emphasizing a collective process. This does not imply that the participatory organizations need to have the same motivation and ambition for participating in the project. But rather that the participants have a perception of the higher purpose behind their participation in the project. To evaluate how *robust meaningmaking* comes into play in Matfloken, we will apply the key criterias outlined in table 4. Through our analysis we will therefore evaluate to what extent the participatory actors experienced meaningmaking throughout the process. Furthermore, we explore whether individual meaningmaking can navigate conflict. Lastly, we evaluate whether there have been any unforeseen consequences related to meaninglessness and the long-term repercussions.

Experienced meaningmaking

Firstly, regarding the experienced meaningmaking during Matfloken, we found that several interviewees had reflected on their initial thoughts and engagement surrounding their participation. Some interviewees highlighted that having an open innovation process, creating collective solutions and system change to the benefit of society were aspects which initially attracted them to participating in Matfloken. As Louis explains:

So, it leads to concrete, tangible solutions and not simply small insignificant things that few are aware of. But rather great and meaningful

things that affect many people. And that has been our experience in other Floke processes as well ... And it is highly motivating to see that it leads to something, that one actually makes a difference. It is not simply a think tank. Things continue to evolve in the aftermath of the project.

Furthermore, Kevin explains: “For me, it is about making a difference. I am triggered by injustice, so that has been my motivation”. These participants emphasize how they hope to impact other individuals or the wider society through their participation. Even though we cannot measure the effect of the meaningmaking in Matfloken, the interviewees' stories indicate how the actors are driven by meaningfulness.

Organizational meaningmaking

Despite the meaningmaking experienced by the individual participants, we discovered through our data that the participatory organizations seemed to lack an underlying higher purpose regarding their participation in the project. Through our data, it also became evident that the shared meaningmaking must also permeate the participatory organizations, not only the individuals, to navigate conflict. As Leo stated:

A project such as this costs a lot of money. So, when we participate in such a project, we always want an outcome. We always want results. Learning is not enough. It must have a concrete outcome.

Another interviewee outlined that to think about possible concepts, all participatory organizations must see a long-term potential for revenue to be motivated to pursue the concept further. This implies that even though the participants in Matfloken experienced meaningmaking on an individual level, they still represent organizations that favor corporate interests. This could result in friction between the newly established meaningmaking and the interests of the participatory organization itself. We would argue that when organizations are primarily focused on achieving outcomes that support their own agenda, difficult conflicts are more likely to emerge. Through our data, we observed an apparent conflict between those who felt that meat was a central part of sustainable food versus those who advocated a plant-based approach. As Anton explains:

But it became evident during the process that we had different stances, particularly regarding agriculture and sustainability. Matfloken was originally called Kjøttfloken (Editor's note: Meat Floke). And that is how many people within agriculture feel nowadays, that red meat is the big villain. But the situation is so much more differentiated than that, particularly in Norway. I think that for global scholars, this is correct. But Norwegian meat is not the villain at all. So, we had a lot of discussions in the beginning. How do we define it? No one has been able to agree. What is sustainability in the food industry?

Such conflicts, we argue, might require a shared higher purpose that can be interpreted flexibly and capture all perspectives. Importantly, we do not suggest that multi-actor projects should be free of conflict. Quite the opposite, we believe that conflicts are likely to arise in such multi-actor projects characterized by divergent interests. However, we would argue that creating a sense of meaning for every participatory organization could make it easier to navigate conflict in a way that allows for multiple perspectives to be included. We would argue that when organizations have spanning interests, it is even more vital to cultivate meaningfulness.

Friction between the individual and the organization's meaningmaking can potentially have some unforeseen repercussions. Through our data, we found that an unforeseen potential consequence of Matfloken was that people quit their jobs after participating. As Sarah, a representative from explains:

There can be several reasons for why people quit their jobs. But sometimes we see that these people become increasingly impatient. They are often change agents that have seen something. That the company needs to change to become a meaningful workplace. They use Floke as a tool to realize their visions for the company. And they go through a Floke and come back and say: "hey, look at how much potential we have to create something new." And then the organization says something like: "But that is not something we will focus on". So, I think people have been through an internal process and then they are like "This is not for me. Because now we have seen all these possibilities and it is in this direction the world must go to become more sustainable. So, if you are not in on it, this is not for me." We have heard different versions of this story. Maybe not as brutal as I just said, but I think that people have an awakening when it

comes to sustainability. I do not know what it is, but what is it that is important in this life?

As such it seems like Matfloken ignited a spark within some of the actors, which led them to make radical changes in their work life, thus allowing them to dedicate themselves to sustainability to a greater degree. The process of Floke seemingly made them impatient for change, which constitutes an important repercussion. Olivia explains how she resigned her job to start her own company working more actively towards a more sustainable future:

Then I just quit right away. Then my colleague in the Communications Department said: Let's just start something on our own. So, when he dared to venture out on his own, I decided to follow along. So, we have kept it going for a year now. It's my dream job.

Making such radical choices may allow them to pursue larger and more impactful wins that might be impossible to implement in their current organization. This turnover, however, might influence the impact that the multi-actor project has on the participatory organization. As Sarah, a representative from Æra reflects:

The organization loses the unique insights that the individual has gained, the personal relations, and the individual insights about the topic and the innovation processes, all these epiphanies gained along the way. It stays with the individual, not with the organization.

Overall, through our analysis, we found that the participants experienced individual meaningmaking. However, the conflict indicates that the participatory organizations lacked a sense of higher purpose regarding their participation in the project. We also found that there was a friction between the individuals' experienced meaningmaking and organizations meaningmaking, thus resulting in loss of prolonged engagement.

Linking robust meaningmaking to the literature

The robust action strategies are “noncommittal actions that keep future lines of action open in strategic contexts where opponents are trying to narrow them” (Padgett & Powell, 2012, p. 24). This framework entails strategies that provide

structure, allow for divergent voices and local experimentation to tackle grand challenges. As already outlined, it became evident through our analysis that the robust action framework does not include the dimension of robust meaningmaking. We would argue that incorporating such a dimension into the existing framework has the potential of strengthening the ability to tackle grand challenges

Drawing on literature, meaningful work is something we all desire (Bailey & Madden, 2016). It can enhance motivation, performance, commitment, and satisfaction. The pursuit of meaning is so strong, that even in bleak moments, people will search for meaning in their life (Frankl, 1959). Scholars have highlighted that meaningfulness is in fact more significant than financial rewards and promotions (Bailey & Madden, 2016). Furthermore, meaningfulness has been revealed to be deeply personal and relates to how the work contributes to the wider society. One important quality of meaningful work is the extent to which work is considered self-transcendent; thus, individuals experience works as more meaningful when it has a purpose that goes beyond the individual themselves (Bailey & Madden, 2016). Furthermore, another important quality relates to how work has a meaning, not only at work, but also in the personal sphere. By incorporating meaningmaking into the framework, it may cultivate prolonged engagement and increase meaningfulness for individual actors and participatory organizations. Importantly, we consider meaningmaking to be dynamic and thus evolving over time. This implies that meaningmaking is conceptualized, revitalized, and refined as the project progresses. Furthermore, this subcategory is in line with the existing robust action strategies which emphasize the importance of flexible interpretations (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022).

Ergene and colleagues (2021) highlights the importance of not simply considering corporate interests where nature is seen as a resource for economic growth and profitability. Rather, nature should be considered to have its own intrinsic value, thus there is a need for alternative ways of organizing and redefining the role of the organization in the Anthropocene. As such, “mitigating harms and doing less bad will not be enough as these approaches still rely on the industrialized production and consumption towards the impossible goal of unlimited economic

growth” (Ergene et al., 2021, p. 1323). Furthermore, Bailey & Madden (2016) identify several factors that foster meaninglessness, where *disconnecting people from their values* was highlighted as the most prominent. This implies that when there is dissonance between personal and organizational values, a sense of meaninglessness is likely to emerge.

4.4.2 Shared system understanding

The ambition of Floke is to create system transformation (Æra, (n.d.-c). Every edition of Floke addresses a specific societal challenge. By viewing challenges as possibilities and mobilizing a broad platform for collaboration, the project aims to generate novel insights and solutions. As such, we would argue that the current robust action framework lacks the focus on system understanding. We have therefore added the additional subcategory, *shared system understanding* which we will elaborate on in the following. We define *shared system understanding* as follows: a fundamental shared understanding of systems building that allows for working towards a higher purpose. It involves working towards a higher purpose than the outcomes of the individual organization.

To evaluate how *shared system understanding* comes into play in Matfloken, we will apply the key criterias outlined in table 4. Through our analysis, we evaluate whether the participants were centered around the organization as the focal point or rather the system. Next, we evaluated whether the changes were incremental or radical in nature. Further, we will consider whether system understanding evolved over time in Matfloken. Lastly, we also evaluate whether there existed some underlying structural challenges.

Moving beyond the organization as a focal point

As outlined above, the aim of Floke is to create system transformation. As Sarah, a representative form Æra explains:

And of course, we want to see if it is possible to achieve system change. That is what we aim for, but it is not easy to accomplish. But that is the ambition in all of our projects. Can we sketch out the future food system through a project like Matfloken? I do not know if we were able to achieve this, but at the end the actors were able to envision a different attractive future for the food system.

We evaluated whether the participants were centered around the organization as the focal point or if they were able to grasp the system. From Æra's perspective, Floke is about creating an open, assumption-free innovation process. Thus, the aim is to challenge the established narratives and the conventional way to conduct business, ultimately potentially changing systems. As Susan, a representative from Æra highlights:

The portfolio of solutions does not aim to solve the problem. The purpose is rather to demonstrate that the systemic challenges can shift towards something better, but then we need to focus on the solutions along the whole value chain. We need a complete package of interventions and be able to see the different parts of the systemic challenges. It is a demonstration of *how* we need to work, rather than the solution itself. It was never intended to be the solution. We believe in stating an example. We think it is important that something is realized, but in fact this is secondary to us. The reason why we still spend so much time and effort on Floke is because we need to raise awareness in the industry. The effort to innovate within one's current lane, which is close to what we do today, cannot result in sustainability. The idea can only be optimized, not create change.

Further, Kate explained that: "So I wanted to be clear on the fact that we need to make a shift away from naivety and achieve something which is tangible and greater". Yet even though one actor expressed thoughts of system thinking, our data revealed that most of the participatory organizations did not share this understanding of the systemic challenges. Rather, the emphasis was more on the organization as a focal point. It is evident that for many of the participants in Floke, the aim is to develop concrete concepts or products. Ken, a representative from Æra highlighted: "When it comes to system innovation, for some organizations it is about generating concrete concepts and products or product lines." Furthermore, we discovered that several of the participants were mostly centered around return on investment or new profitable projects. As Leo stated:

A project such as this costs a lot of money. So, when we participate in such a project, we always want an outcome. We always want results. Learning is not enough. It must have a concrete outcome.

Other interviewees outlined that to think about possible concepts, participants must see a long-term potential for revenue to be motivated to pursue the concept further. Thus, we argue that the system perspective generally appeared to be lacking in Matfloken. One can argue that systemic change might have been prevented by a constant focus on results and realizable outcomes for individual organizations. These stories indicate that most of the participants first and foremost consider financial gain as the most important outcome of the project.

Shared system understanding to evolve over time

Our extended model of robust action strategies, which also includes the dimension of time, shows that system thinking can and will evolve over time. Even though the participatory organizations do not have the initial systemic mindset, we would argue that it may mature during the process of iteration, acquired knowledge and collaboration. As Christina explains:

In the beginning of the project the actors were very focused on their own home court, and where they can achieve change. So that is something one notices, and that is why it is important to take our time in the starting phase. Then each of us evolve from focusing on our home court to working together on the same playing field. One notices that and the difference between the actors' level of maturity. That is, to what extent they have participated in such projects previously.

Another interviewee highlights that the insight phase fostered a shift in maturity to become more nuanced in their opinions and adopt new ways of perceiving the problem. As such, it is evident that it is a dynamic, evolving, adaptive process. These stories show that time is an important aspect of the sustainability-oriented innovation processes. Thus, the process of understanding the system complexity is continuously evolving. Furthermore, it is important to take into consideration the complexity of the system at stake, indicating the need for long-term orientation.

The underlying structural challenges

Through our data, we identified several underlying structural challenges that could potentially impact the extent to which a system understanding emerges. Ken, a representative from Æra, highlights that what inhibits solving the grand challenges is the system itself:

But in the Floke projects it becomes evident that what really hinders solving the Floke is the system itself. In a way, it is new models for collaboration. One needs to start there before one can outline concrete concepts.

Which arguably constitutes a common challenge when working towards system transformation, regardless of which system one is dealing with. Furthermore, Susan, another representative from Æra reflects upon the system dimension as such:

Food has a system, right, all the way from the ecological system around harvesting, to production and sales on the other end. One can claim that such a system has an interest in upholding itself, that is, the system becomes rigid. It becomes almost like a regime; you can call it. Few regimes are as stuck as the food system in Norway. It is centered around self-interest and optimized for volume and price ... In practice the system has few reasons to change and will therefore only respond to pressure from the outside. That is why my initial thought was that this Floke would be highly conflicted. Many organizations have so much to defend and uphold. And there is another dimension: there is an extremely influential cultural aspect regarding food, which makes it particularly challenging. So, it is not only about how we have designed the system, but there also exists a social system

As such, there seems to be a fundamental unwillingness to change the current food system. Which also speaks to the complexity of this particular Floke. Another challenge that became evident was the influence of the financial structure on Matflokken. Through our data, we discovered that there is a differentiated financial model for the participants, that is, some participants have the role as main partners, thus investing more in the project. While other participatory organizations pay a smaller fee in accordance with the size of the organization. Public organizations were invited in without partaking in the financial plan, which influenced their perception of their role in the project. As Louis states:

We came to a set table, and we were there to contribute to a positive change. That is why I felt that it was not appropriate to have a lot of opinions about which concepts the group should pursue. It should be up to them, as they eventually are the ones that ultimately own the concepts.

Another interviewee highlighted that some of the more sensitive and controversial topics were handled a bit too carefully because some of the more heavily invested sponsors had a greater self-interest in preserving the status quo. Furthermore, as is pointed out by another actor, the financial structure of the project itself can increase the pressure to deliver potentially profitable results. As such, one can question whether the financial structure of the project may have lowered the motivation to develop a shared system understanding. In accordance, other interviewees highlighted the general issue of the food system in Norway, namely that parts of the value chain lack the necessary incentives to change such a profitable system. Additionally, many consumers favor the status quo, thus making it even more challenging to achieve a system transformation. Kate highlights the problematic aspect of simply relying on consumers and their conscience to drive systemic change:

I resent the belief that it is the consumers' guilt who will determine how sustainable the food production is, i.e., that their consumer behavior will create a different demand. It does contribute and it is important. But it is not enough to drive systemic change fast enough. There must be incentives.

This statement highlights that organizations must play an important role in changing the current system rather than leaving it up to the consumers. However, it is also highlighted that such systemic change cannot simply be left up to organizations to solve. Most organizations must chase profit and financial gains to survive. As such, one can question whether there is a need for governmentally driven regulations to incentivize and facilitate systemic change for the food system. As Kate reflects:

Having good intentions is a damn poor driver on its own. It needs to be supported, preferably regulatory, it needs to be a demand, a contingency. I strongly believe in governmentally driven regulatory corporate responsibility. Because good intentions often lead to greenwashing, which is appalling. This is what has influenced the first phase of Matflokken, just bullshit really ... When something goes from being trendy at Grünerløkka to being a commodity that everyone needs to implement because there exists a regulatory contingency.

Such incentives could potentially foster system transformation, simply by making it a requirement. However, Holling (2001) highlights that regulations are inert and static and might as such act as an inhibitor for organizations and other actors who pursue system transformation. Therefore, since organizations can change more rapidly, it might not be beneficial to implement regulations. In fact, organizations might be better equipped to ensure evolutionary progress in the field of sustainability. Another interesting feature was that several interviewees from Æra questioned whether the design methodology is sufficient in order to tackle grand challenges. As Susan, a representative from Æra explains:

We believe there is something fundamentally problematic with this way of thinking. Because grand challenges can seldomly fit into such a linear process, so even though it is so-called iterative, it is still linear.

This statement is aligned with our argument in the theory section, suggesting in line with Carlgren et al. (2016) that design thinking is first and foremost applied for creating incremental innovation. This is further supported by Gaziulusoy (2015), who argue that there is a lack of design and innovation approaches which enable structural, systemic, societal transformations. For this reason, it could be fruitful to explore other methodologies that can better tackle grand challenges and allow for even more iterativity.

Incremental vs. radicality

The previously mentioned realized projects, Food Revolution and Sâdd, can be described as incremental improvements to business as usual. Food Revolution is a direct result of Matfloken and is simply a means to achieve product optimization. However, since this is an ongoing process, we acknowledge that we might not know the full repercussions of the project yet. Drawing on Adams et al. (2016), we would argue that Food Revolution can be characterized as *operational optimization*, the first level of SOI. However, Food Revolution is a result of a collaborative effort where different actors representing various parts of the value chain have come together, and as such, we recognize that the project goes beyond exploiting internal resources and capabilities found in the first level of SOI. Sâdd is also an example of an incremental improvement since it involves creating a plant-based restaurant rather than transforming the organization.

Overall, through our analysis, we found that the ambition behind the project was to create system change but it became evident that the participants were largely focused on return on investment and new profitable product development. Even though it is difficult to measure the extent to which participants have a shared system understanding, we would argue that the fundamental focus on outcomes and realizable projects indicate a lack of system perspective. Furthermore, there seems to be an unwillingness to change the current system. However, we would argue that the shared system understanding seemed to be maturing over time through increased knowledge and collaboration. We also identified several structural challenges that impact the extent to which the participants in Matfloken can experience system understanding. Finally, we also identified the concepts developed to be merely incremental innovations rather than systemic.

Linking shared system understanding to the literature

As already outlined, we identify that the robust action framework does not include the dimension of *shared system understanding*. In our literature review, we outlined the different levels of SOI, with particular emphasis on the system perspective. Drawing on literature, this perspective emphasizes how a radical shift in thinking is required, namely thinking beyond the organization itself (Adams et al., 2016). This systems perspective constitutes the highest level of SOI. This perspective further states that no single actor or firm can create systemic sustainable value alone, thus emphasizing collaboration as a prerequisite for systemic transformation. Grewatsch et al. (2021) further emphasize that it is not sufficient to examine parts of the systems, for example the organization, to comprehend the grand challenge. Thus, a system can be more than simply the sum of its parts. We argue that pursuing system change requires an understanding of the fact that one works toward something that requires organizations to go beyond the governing economic paradigm of today (Dyllick & Hockerts 2002; Esslinger 2011; Stubbs & Cocklin 2008), namely less focus on profit maximization. Thus, organizations need to add equal value to societal and environmental considerations to tackle grand challenges.

In our initial engagement with the data and the literature, it became evident that the system perspective arguably was not the focal point of the robust action

strategies framework. As such, it appeared necessary to include an additional dimension that fully cultivates the system perspective. We would argue that incorporating such a dimension into the existing framework has the potential of strengthening the ability to tackle grand challenges. Importantly, we consider *shared system understanding* to be dynamic and thus evolving over time. Furthermore, the nature of grand challenges entails a long-term perspective (Ferraro et al., 2015). Thus, the robust action framework also emphasizes the long-term perspective and involvement over time (Etzion et al., 2017; Ferraro et al., 2015; Gehman et al., 2022). This implies that the system perspective is subject to change and refinement throughout the process. The robust action framework does not aim to reach a conclusion but is rather a continuous process that generates novelty and prolonged engagement. As such, one must bear in mind that such a short multi-actor project, such as Matfloken, can only go so far in developing system understanding.

Even though the concrete outcomes of Matfloken merely qualify as incremental improvements, we argue that Floke as a platform has the potential of creating societal change by achieving the highest level of SOI in the long term; thus, requiring a series of temporally and spatially interconnected events (Ferraro et al., 2015). *Shared system understanding* advances the contribution made by robust meaningmaking as it enables actors to truly grasp the system complexity, thus, making the levers for change more apparent. We argue that by extending the current framework for robust action strategies, the process of tackling grand challenges becomes more attainable throughout an ongoing iterative and dynamic process.

Part V: Discussion

5.1 Summary of findings

In the preceding section, we have presented the findings from our qualitative case study. We investigated how Matfloken aligns with robust action strategies to understand whether such a short-term project characterized by spanning interests can contribute to tackling grand challenges.

We found the three initial robust action strategies *participatory architecture*, *multivocal inscription* and *distributed experimentation* to be partially aligned with the process of the multi-actor project, Matfloken. First, we identified that Matfloken to some extent fulfills the criteria of *participatory architecture*. Through our key evaluative criterias, we found that the structural dimensions and rules of engagement in Matfloken influenced the interaction and actions. Furthermore, having a certain degree of heterogeneous actors while still obtaining a high level of trust ensures prolonged engagement. Yet, the frequent turnover in the process and lack of diversity threatens the trust and might create setbacks for progression and novelty to emerge in the long-term.

Second, we also identified that Matfloken to some extent fulfills the criteria of the robust action strategy *multivocal inscription*. We found that the physical artifacts generated through Matfloken promoted the necessary coordination between the heterogenous participants, even when it was hard to obtain consensus. We found that the inscriptions in the multi-actor project, Matfloken, does not fully allow for multiple and flexible interpretations, thus potentially hindering novel solutions and the inclusion of the diverse stakeholders. This multivocality provides to some extent a common ground for discussion.

Third, we identified that Matfloken was highly aligned with the robust action strategy *distributed experimentation*, however the project faced certain challenges. Through our data, we found that Æra were particularly skilled in facilitating distributed experimentation. The project generated both tangible and intangible small wins, which may encourage larger wins in the long haul. Ultimately, they all have the potential to contribute to generate momentum and create incremental advances that contribute to making new small wins visible. It also became evident

that the full repercussions of the project are not yet known, as some ideas are stored for later. We also found that the Covid-19 pandemic created a loss of momentum and power for the aftermath of the project, implicating potential positive repercussions.

Our main finding from our data constitutes the extended theoretical model of the robust action framework. Through our engagement with our data, we found that the robust action framework generally lacked the dimensions of meaningmaking and system understanding. Therefore, we have extended the framework to induce more radical solutions, better navigate conflict and sustain engagement. We have created an umbrella term, towards a *system understanding*, comprising two subcategories, *robust meaningmaking* and *shared system understanding*.

We identified that the participants in Matfloken experienced *meaningmaking* in the process to a large extent, thus, focussing on how the project and their contribution could have an impact on the wider society. Despite the meaningmaking experienced by the individual participants, we found through our data that the participatory organizations lacked an underlying higher purpose regarding their role in the project. Such friction between the individual and the organization's meaningmaking can potentially have some unforeseen repercussions, and as such, we highlight the importance of cultivating meaningmaking within organizations and projects when tackling grand challenges. By incorporating meaningmaking into the framework, it may increase meaningfulness for individual actors and participatory organizations.

By analyzing our data, we found that the *shared system understanding* generally appeared to be lacking in Matfloken but that this can be matured. Further, we found that systemic change might be prevented by a constant focus on results and realizable outcomes for individual organizations, thus requiring a new way of thinking about organizations today. Through our data, we identified several underlying challenges that could potentially impact the extent to which system understanding emerges, namely the financial structure of the project as well as the lack of incentives for organizations to change. As the original theoretical framework, we consider the entire extended theoretical model to be intertwined and interconnected in an iterative and dynamic process over time.

5.2 General discussion

The empirical analysis reveals that there are some fundamental challenges related to the robust action framework for such a short-term multi-actor project when the aim is to tackle grand challenges. Short-term multi-actor projects that are characterized by spanning interests and partly conflicting agendas require additional strategies to achieve sustainability-oriented innovation on the highest level, namely *systems building*.

Through our extended robust action framework, we identify the underlying supportive structure, *towards a shared understanding*, as well as the two subcategories, *robust meaningmaking* and *shared system understanding*. We would argue that the additional subcategory *meaningmaking* is aligned with the existing robust action framework. Particularly, since meaningmaking can be interpreted flexibly and encompass divergent interests and perspectives. However, our second subcategory, *shared system understanding*, could potentially contradict the premise of the robust action strategies. Especially since robust action strategies are perceived to be non-committal actions. Through incorporating system understanding, we set a clearer direction for the multi-actor project, thus, threatening the flexibility of the framework. However, we would argue that this multi-actor project has certain characteristics which create a need for more direction, namely the time frame and the complexity.

Time frame. The multi-actor project Matfloken was conducted over a period of 8 months. Projects that aim to attain sustainable innovation at a system level requires a long-term orientation due to the complexity of the systems and the dynamic nature of the grand challenges (Gaziulusoy, 2015). First and foremost, we believe that meaningmaking may reduce the challenges related to such short-term projects. Even though we cannot measure the effect of the meaningmaking in Matfloken, the interviewees' stories indicate how the actors are driven by meaningfulness. By cultivating meaningfulness in such an innovation project, it can increase motivation, which can result in enhanced performance, commitment, and satisfaction (Bailey & Madden, 2016). Thus, by incorporating robust meaningmaking in multi-actor projects like Matfloken, it can foster engagement

and motivation amongst the actors, not only during the process but also ensure commitment in the long-term. It is our firm belief that cultivating a sense of meaning and higher purpose in multi-actor projects characterized by spanning interests can enable stronger and more prolonged engagement and can help navigate conflict. Second, we argue that system understanding can also contribute to reducing the challenges related to short-term projects. Even though we cannot predict the full repercussions of Matfloken, we would argue that the project was not able to accomplish system change. This is not surprising when considering the short time frame. However, we would argue that by incorporating a *system understanding* into such a multi-actor project, it could enable more radical changes. Such a system understanding might enhance the potential for radical solutions to emerge, even when time is limited. Lastly, we acknowledge that system understanding requires a maturation process as it requires actors to create linkages between distal connections that are dynamic in nature (Gaziulusoy, 2015).

Complexity. The spanning interests and the partly conflicting agendas make Matfloken a highly complex project. Our data revealed that in the food system in Norway there are parts of the value chain that lack the necessary incentives to change such a profitable system. Additionally, many consumers favor the status quo, thus making it even more challenging to achieve system transformation. Furthermore, as one interviewee highlighted, there is an influential cultural aspect related to food. We would argue that our two additional subcategories might mitigate some of the challenges related to this complexity. First, we would argue that by incorporating meaningmaking into such complex multi-actor projects, one can reduce the conflicting agendas stemming from self-interest. Through meaningmaking participatory organizations can look beyond the organization and better grasp their vital role in handling such an immense challenge. Second, we would argue that understanding the system complexity can make the participatory organizations more easily identify levers for change, which is also in line with the arguments put forth by Adams et al. (2016). Such an understanding might enhance the potential for radical solutions to emerge, even in short-termed, highly complex projects.

Through our research question, we wanted to explore how such multi-actor projects characterized by spanning interests and partly conflicting agendas may contribute to SOI. It is evident that Matfloken generated important incremental innovations, such as Food Revolution and SÅdd. Based on Adams et al. (2016), the project resulted in an approach to SOI that can be characterized by being solely operational optimization. This feature is characterized by being largely internal as well as focusing on how to do things better with less. Even though the project is characterized by collaboration with others in the value-chain, we would argue that the individual organization's focus is on how to improve its own operations and/or improve product development. The design thinking methodology has been highly beneficial in creating these incremental innovations, as aligned with literature (Buhl et al., 2019; Carlgren et al., 2016). However, as highlighted throughout this master thesis, we argue that it remains unclear whether radical, systemic change can be generated through using design thinking. As argued above, Matfloken did not result in a fundamental systemic change. Yet, we want to highlight that the short time frame and the complexity of the project can be argued to inhibit such transformations. Considering this, we would argue that it is difficult, if not impossible to create system change in only 8 months. Still, we consider Matfloken to have been an important collaboration project.

Through Matfloken, one has been able to get large parts of the system in the same room to diagnose issues, and as such, better comprehend the system complexity, develop trust, and identify levers for transformation. This is in line with the arguments put forth by Adams et al. (2016). This implies that we consider Matfloken to initiate conversation between stakeholders and various parts of the value-chain with partly conflicting agendas. Apart from the realized projects mentioned above, the participatory organizations have built trust amongst competitors, extended their network, as well as gained new insights and competencies in the field of sustainability and innovation. We would therefore argue that even though system change was not attained, it has the potential to create long-term impact. Matfloken can also be considered as a starting point towards building new platforms for collaboration with diverse stakeholders to derive new solutions on a system level. This is aligned with Adams et al. (2016) who argues that sustainability-oriented innovation aimed at system transformation requires wide collaboration: "Novel collaborations are important for systems

builders for the dialogues they inspire, the legitimacy they endow, the opportunities for new knowledge acquisition and the creative and responsive solutions they stimulate” (Adams et al., 2016, p. 194). For this reason, we consider Matfloken to have been a small win that might ultimately result in larger wins by building a bridge between system actors.

In the future, we would argue that it could be beneficial to repeat Matfloken in a series of projects, every four to five years. As such, these projects can be a force that unites the actors and infuse them with new insights and knowledge. We would argue that such a structure has greater ability to foster system transformation in the long haul. These projects should include even more relevant and diverse stakeholders. We also identified that multivocality in Matfloken was not flexible enough, thus, some voices may have been left out to some extent. One could argue that by allowing even more flexible interpretations it could have resulted in more novel experimentations and small wins. However, in our opinion, considering the short time frame, it might have been necessary for Æra to drive the process forward by narrowing the process in between the phases, and thus leave some ideas behind. Particularly since they are skilled within the design methodology and claim to quickly recognize the difference between a good and a bad idea. If Matfloken is repeated sequentially, it could, however, potentially make it possible to increase multivocality. Nevertheless, we acknowledge that the long timespan between each sequence might make multivocal inscription, as anticipated by robust action strategies difficult.

Meaningmaking and shared system understanding have the potential to cultivate sustainability-oriented innovation on a system level in more sequence-based projects. Not only can meaningmaking create sustained engagement amongst actors, but it can also foster organizational meaningmaking. Even though the participants experienced meaningmaking on an individual level, it became clear that it was not always shared by the participatory organization, since certain actors decided to leave the company. It was highlighted in our findings that enough time and resources is imperative to such projects. An organization has a limited number of resources; thus, we would argue that by increasing organizational meaningmaking in the field of sustainability and system change more resources could be allocated to pursue such projects. Furthermore, this could also sustain

engagement in between the repeated series of Matfloken and alleviate conflicts in the project. As such, more novel and radical solutions could emerge. Due to the nature of the subcategory *shared system understanding*, it can also lead to more radical solutions by increasing the understanding of the system complexity. Developing such an understanding requires time and maturation, and as such, is more likely to emerge in such a sequential and dynamic process. In Fig. 1, we have explicitly shown how the robust action strategies evolve over time, thus aligning with our recommendation of repeating Matfloken over time to create evolutionary learning and allow novel solutions to emerge.

Lastly, we want to reflect upon whether it really can be up to organizations alone to change the food system. As outlined by interviewees, there is a general problem with the food industry, namely that the system is stuck and there is a lack of incentives to change such a profitable system. As such, we would argue that it could be beneficial to create governmentally driven incentives that are better suited to target system transformation than those incentives which are already in place.

Ultimately, we offer a way of understanding how short-term multi-actor projects can contribute to sustainable innovation. Furthermore, we advance the robust action framework, and offer an additional underlying structure that can provide a sense of higher purpose while increasing the probability of system transformation in collaborative projects. To tackle grand challenges, we must come together, understand the complexities of the system, look beyond our own agendas and interests.

5.3 Theoretical and practical implications

This study set out to explore how multi-actor projects, characterized by spanning interests and partly conflicting agendas can contribute to sustainability-oriented innovation. Based on the results presented in the previous chapter, we consider our theoretical contributions and implications on the multi-actor perspectives in relation to tackling grand challenges to be fourfold. We will highlight the practical implications in relation to these contributions.

First, we offer a new perspective on the robust action framework. Through our extended robust action framework, we identify the underlying supportive structure, *towards a shared understanding*, as well as the two subcategories, *shared meaningmaking* and *shared system understanding*. Thus, incorporating two new dimensions to the framework which increases the robustness of the model. By adding a dimension of meaningmaking, we draw upon existing literature that emphasize the importance of creating a sense of meaning and a higher purpose for employees today. As such, we draw a line between this premise and multi-actor projects directed at tackling grand challenges. It is our firm belief that cultivating a sense of meaning and higher purpose in multi-actor projects characterized by spanning interests can enable stronger and more prolonged engagement and can further help navigate conflict.

Further, by adding a dimension of system understanding we draw a line between sustainability-oriented literature and the robust action framework. Sustainability-oriented literature calls for more collaborative efforts to be able to reach system transformation. As such, we consider it imperative to incorporate a systems perspective when dealing with multi-actor frameworks, such as the robust action strategies. Despite the low generalizability and the fact that our findings are only based on one case study of a short-term project, we would argue that our findings may have implications beyond our case. We would argue that the characteristics of our contribution can induce prolonged engagement and achieve radicality by addressing some fundamental needs in humans to experience a sense of meaning and follow a higher purpose.

Ultimately, our discussion shows that by extending the current framework of robust action strategies, the process of tackling grand challenges becomes more attainable throughout an ongoing iterative and dynamic process. Through our Fig. 1, we outline how the three original robust action strategies are interlinked with our additional contribution. Importantly, we consider our extended framework to be a starting point rather than a fully developed theoretical contribution. More research is therefore needed to investigate how *robust meaningmaking* and *shared system understanding* impacts robust action strategies. It is possible to imagine alternative versions of the extended framework and theoretical model. It might be fruitful to pursue other avenues, such as viewing the two categories as

independent, rather than intertwined. Furthermore, one should consider to what extent there is a need for an overarching term that capture both structures.

Second, our findings constitute another starting point for understanding how a short-term, multi-actor project can impact sustainability-oriented innovations. Our discussion shows that it does not only result in incremental sustainable innovations. It can also be considered as an essential collaboration platform that might foster system transformation in the long haul by extending networks, allowing divergent actors to engage, and facilitating collaboration over time. Such projects seem to be highly anticipated to solve grand challenges. Furthermore, our findings also indicate how a system perspective can evolve over time in such short-term projects. This indicates a call for investigating whether sequence-based multi-actor projects might contribute to increased radicality and ultimately system change.

Some important practical implications can also be outlined. Through *robust meaningmaking* and *shared system understanding*, we encourage innovation practitioners to consider these dimensions and how it can impact multi-actor projects. Furthermore, our discussion reveals that continuity of actors is a vulnerable aspect of such multi-actor projects. By incorporating meaningmaking, we believe that it can better sustain engagement, even when there are divergent interests at stake. Furthermore, practitioners should consider the extent to which there is a sufficient level of diversity to ensure a rich multivocality. Lastly, our discussion revealed that practitioners should be mindful to which extent they choose to guide and control the innovation process as this might have a negative effect on the multivocality.

5.4 Limitations and future research

Our aim was to offer a perspective on how a multi-actor project can contribute to SOI on a system-level. The research resulted in extending the robust action framework by adding an underlying supportive structure *towards a system understanding*, comprising two subcategories, namely *robust meaningmaking* and *shared system understanding*. However, there are some limitations to this study. First, a significant limitation of our research is that the data consisted of only interviews, and not observation. By applying triangulation, we could have

enhanced the quality and credibility of our study (Patton, 1999). However, our case project took place two years before data collection, making it impossible. Second, due to the frequent turnover in the project, we were not able to interview representatives from all participatory organizations. By increasing our sample, we could have further strengthened our findings. Third, due to our chosen research design, case study, and the size of our sample, our findings have limited generalizability. We have solely investigated one short-term multi-actor project aimed at solving one specific grand challenge. To validate our findings, and explore the generalizability, further research is needed. Fourth, as Matfloken had taken place two years prior to data collection, we acknowledge that there is a greater risk that participants are not accurately able to recall the events accurately.

5.5. Conclusion

This study set out to explore how multi-actor projects, characterized by spanning interests and partly conflicting agendas can contribute to sustainability-oriented innovation. We revealed how the robust action strategies came into play in the short-term innovation project, Matfloken, while outlining challenges that inhibited the project from fully cultivating the non-committal actions. We found that a lack of diverse actors and the high turnover in the project may have inhibited more novel solutions to emerge. Furthermore, we highlighted the challenge in allowing for multivocality while also creating a clear direction for such short-term, complex projects.

Essentially, we posit that the robust action framework could benefit from being extended to include two new, interconnected dimensions. Thus, we identify the underlying supportive structure, *towards a shared understanding*, as well as the two subcategories, *shared meaningmaking* and *shared system understanding* to be fruitful contributions. By incorporating robust meaningmaking, the framework becomes more robust as it ensures a sense of higher purpose and ultimately ensure sustained engagement. We posit that through increased understanding of system complexity, actors can more easily identify levers for change. Together, these structures allow for more novel solutions to emerge that ultimately can lead to system change. We further discussed how short-term multi-actor projects, such as Matfloken, can be essential leverages for change. By engaging large parts of the system in the room to diagnose systemic issues and develop trust, actors can more

easily identify levers for transformation. On a purely practical note, we recommend that such multi-actor projects are repeated in a sequence of projects, every four to five years. We posit that such a structure might foster a highly anticipated system transformation in the long haul.

If our species does not survive the ecological crisis, it will probably be due to our failure to imagine and work out new ways to live with the earth, to rework ourselves and our high energy, high-consumption, and hyper-instrumental societies adaptively ... We will go onwards in a different mode of humanity, or not at all (Plumwood, 2007, p. 1).

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Interview guide (participants)

Background and sustainability

- 1) Can you tell us about your background?
 - a. How did you get involved with sustainability work?
 - b. What engages you when it comes to sustainability?

Matfloken and critical events

- 2) If you think back to the time prior to Matfloken. Can you remember what kind of expectations you had?
 - a. What was the reason behind participating in Matfloken?
 - b. What did you expect to learn? What was your role?
- 3) Were there any phases that were particularly critical to the project?
 - a. Why was it critical?
 - b. What do you think you learned the most from?
- 4) Matfloken cut across the value-chain, how did this impact the project?

Retrospective reflection

- 5) What happened after Matfloken was finished?
 - a. Did you share your knowledge in your organization?
 - b. Has your participation influenced the organization in any way?
How
 - c. Were any changes implemented?
- 6) Have you maintained contact with other participants?
 - a. Have you collaborated with any of the actors after Matfloken?
- 7) If you were to do it again, what would you have done differently?
 - a. If you could have influenced the learning process, what would you have done differently?

Interview guide (facilitators)

Background and sustainability

- 1) Can you tell us about your background?
 - a. How did you get involved with sustainability work?
 - b. What engages you when it comes to sustainability?

Matfloken and critical events

- 2) If you think back to the time prior to Matfloken. Can you remember what kind of expectations you had?
 - a. What was the reason behind facilitating Matfloken?
 - b. What did you expect the participants to learn?
 - c. What was your role?
- 3) Were there any phases that were particularly critical to the project?
 - a. Why was it critical?
 - b. What do you think the participants learned the most from?
- 4) Matfloken cut across the value-chain, how did this impact the project?

Retrospective reflection

- 5) What happened after Matfloken was finished?
 - a. Did you share your knowledge in your organization?
 - b. Has your participation influenced the organization in any way?
How
 - c. Were any changes implemented?
- 6) Have you maintained contact with some of the participants?
- 7) If you were to do it again, what would you have done differently?
- 8) From your perspective as a facilitator, what is needed to solve Matfloken?