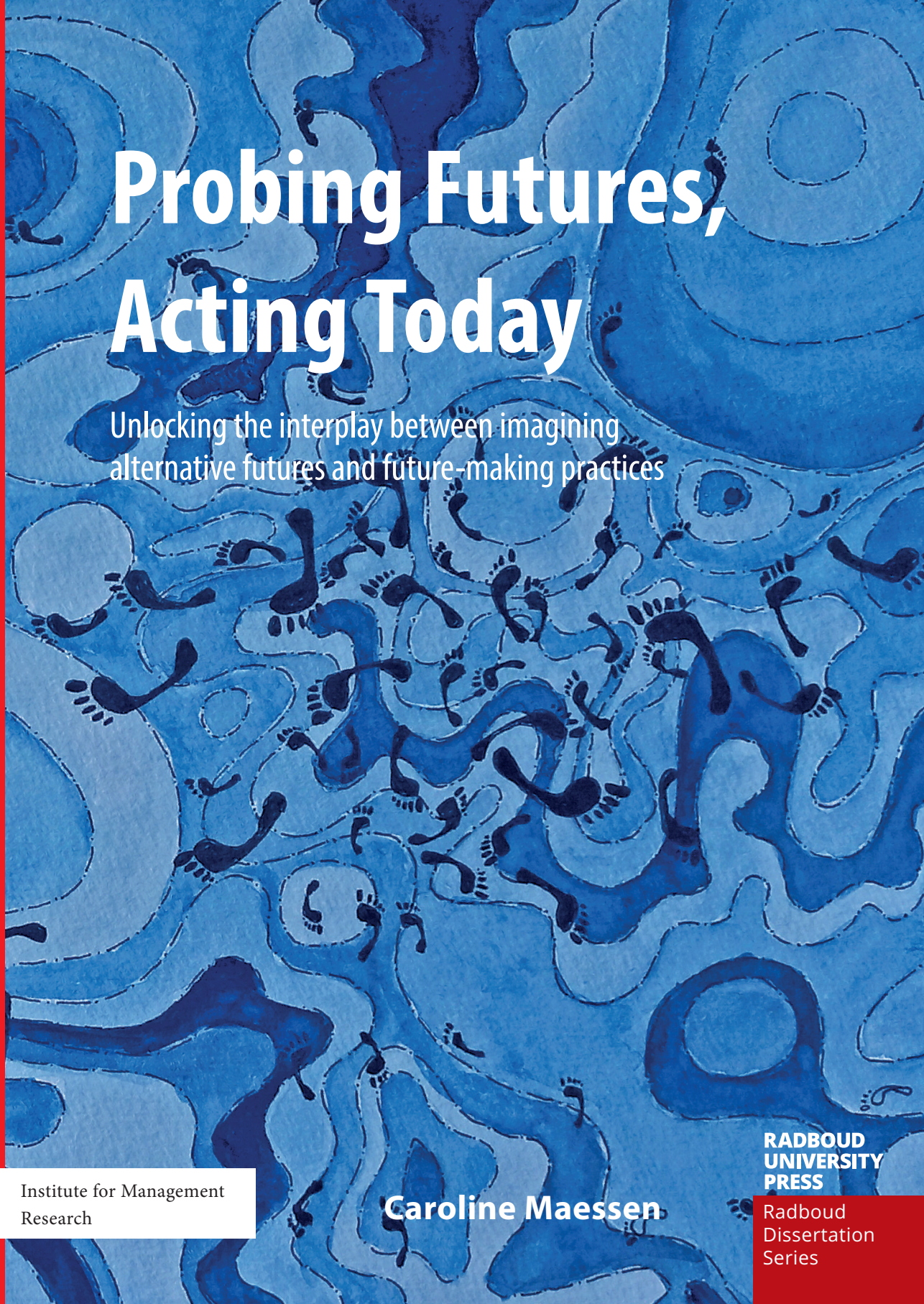




Probing Futures, Acting Today

Unlocking the interplay between imagining
alternative futures and future-making practices

Institute for Management
Research

Caroline Maessen

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Series

Probing Futures, Acting Today

**Unlocking the interplay between imagining alternative futures
and future-making practices**

Caroline Maessen

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Author: Caroline D. Maessen

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Probing Futures, Acting Today

Unlocking the interplay between imagining alternative futures and future-making practices

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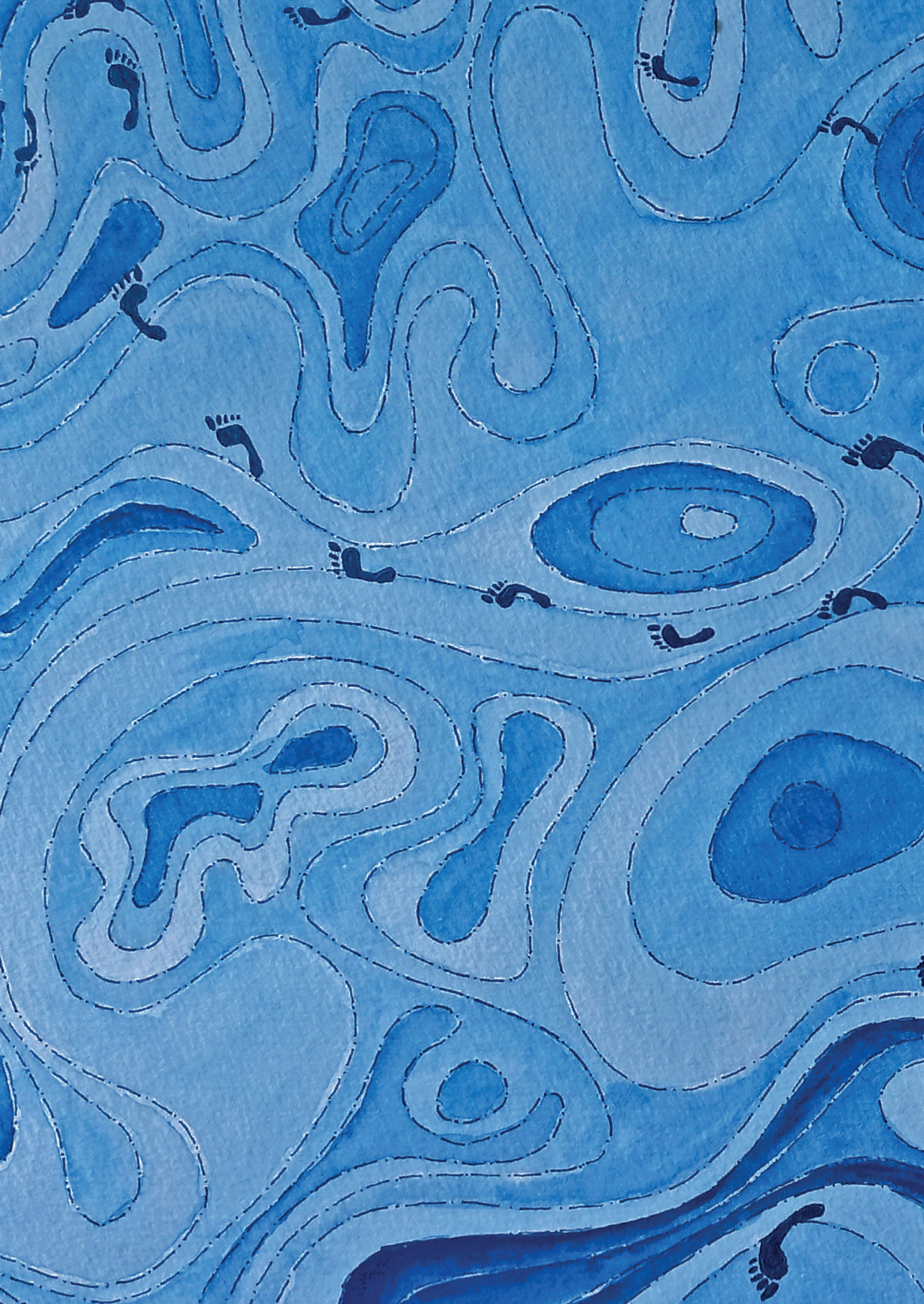
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As in this era officials are making formal apologies for slavery and oppressive behaviour by our ancestors, future generations will need to apologise for our generation's behaviour. How can we connect with possible alternative futures to act better today?



1.

Introduction and overview

Imagine a world where we all live to be 150 years old and where you can buy diseases to satisfy your need for attention and pampering; picture a dense city where everyone can live close to amenities and work because general practitioners hold their consultation hours in your living room while you are working elsewhere; or envision that travelling from your city apartment to your grandparents in the countryside requires booking an available spot in road traffic similar to how booking a flight ticket matches a spot in air traffic. Such future imaginations emerged during future exploration bootcamps in, which I was involved as a co-design researcher from 2014 to 2018, where professionals and students cooperated to explore alternative futures related to healthcare, data-driven technology and digitalisation, and urban area development. Participants enthusiastically engaged in imagining alternative futures but faced challenges integrating emergent insights into their organisational contexts, hindering proactive organisational adaptation.

1.1 Societal Grand Challenges and Future-making Practices

Future-making refers to how people and organisations prepare for and shape what lies ahead. It is the work of imagining, interpreting, negotiating and giving form to preferred futures while recognising that the future may unfold differently than expected (Whyte et al., 2022). Throughout history, imagination has guided human actions, from ancient kings seeking guidance from oracles to envisioning automated futures at events like the 1939 New York World Fair. Imagination propels organisational endeavours but also sets limits on what is considered possible (Lê, 2013). However, the future often evolves beyond collective imagination due to unforeseen developments (Adam & Groves, 2011; Beckert, 2020).

This tension is particularly evident in the context of grand challenges such as climate change, depletion of natural resources, loss of biodiversity, social inequality and increasing technological complexity. These challenges are complex and value-laden, and they require systemic transformations that cannot be achieved by individual actors alone (Ferraro et al., 2015; George et al., 2016). Nevertheless, organisations in the Global North continue to thrive on practices that have brought prosperity, but are viewed as inappropriate for dealing with current societal challenges. Fossil fuel is being replaced by lithium-dependent batteries, farmers are being bought out to build housing in future flood-prone areas, refugees lack adequate shelter, and youth face uncertain career paths while having to deal with mounting (student)-debts. As organisations continue to grapple with the intricacies

and uncertainties of complex societal developments, scholars are increasingly calling for a deeper understanding of how organisational future-making practices produce and enact the future (Beckert, 2021; Wenzel et al., 2020; Wenzel & Krämer, 2018).

While significant progress has been made in understanding how organisations tackle grand challenges (Gümüşay et al., 2022), less attention has been paid to how organisational actors imagine and construct alternative futures as part of this future-making process. Additionally, current organisational future-making practices run the risk of turning such large-scale problems into business as usual (Wright & Nyberg, 2017). Recognised as powerful engines of innovation, organisations often base their strategies on fictional expectations they can readily resource, thereby perpetuating current entrenched economic and political structures that foreclose change (Beckert, 2020, 2021). A key challenge for organisations that I encountered while collaborating as a co-design researcher during aforementioned bootcamps is to move from ‘probabilistic’ thinking – focused on predicting and controlling likely futures – to ‘possibilistic’ thinking, which opens up a wider range of alternative futures and engages with their ethical implications (Grimes & Vogus, 2021).

Future-making has received increasing scholarly attention in organisational studies, particularly amidst calls for reinventing research and practice to organise more sustainable futures (Howard-Grenville, 2021b; Jarzabkowski et al., 2021). While this area of research intersects various domains, such as management, sociology, innovation studies, and sustainability (Fuglsang & Mattsson, 2011; Groves, 2013; Knappe et al., 2019; Selin, 2008; Tutton, 2017; Wenzel & Krämer, 2018), two key communities have been shaping this discourse from a processual ontology. First, the practice approach to future-making (e.g., Comi & Whyte, 2018; Pettit et al., 2023; Rindova & Martins, 2022; Wenzel, 2022) challenges linear engagement with the future. Second, the EGOS standing working group on ‘Organising Desirable Futures’ advocates for prospective theorising with speculative rigour and shaping guiding societal imaginaries (Gümüşay & Reinecke, 2022, 2024). While both communities focus on organisational practices that shape future-making, the latter emphasises an ideological perspective, considering the broader societal implications of these practices.

Despite the growing interest in future-making, particularly in the context of grand challenges, there remains a significant gap in understanding how organisations engage in the imaginative work necessary for shaping genuinely alternative futures (Augustine et al., 2019; Gehman et al., 2022). Scholars have started to explore and

theorise how organisations use envisioned futures to reduce the openness of the future and develop courses of action in the present (Comi & Whyte, 2018; Pettit et al. 2023; Thompson & Byrne, 2022). However, imagination not only helps organisations navigate uncertainty but also shapes their ethical and strategic responses to societal problems (Jasanoff, 2020). As organisations move beyond traditional linear strategic planning to embrace the complexities of future-making, they face critical questions about the long-term societal and environmental impacts of their current actions (Adam & Groves, 2011; Wenzel, 2022). Empirical research on how organisations take responsibility for their imaginative work in the face of grand challenges is limited (Gehman et al., 2022; Howard-Grenville & Spengler, 2022).

Scholars often overlook the difficulties of imagining genuinely alternative futures (Hajer & Versteeg, 2019) and the challenges for acting accordingly imposed by risk mitigating and control practices (Uhl-Bien & Arena, 2017). This gap in literature raises critical questions: How do organisations tap into imaginations beyond what is valued in the status quo? How do these imagined futures shape and get shaped by the future-making practices that organisations adopt? These questions become especially salient when considering that grand challenges often require not just incremental solutions but entirely new ways of thinking about the future (Gehman et al., 2022; Howard-Grenville, 2021). This dissertation seeks to address these questions by investigating the following research question:

How does imagining alternative futures shape and get shaped by future-making practices?

Drawing on a processual lens, this research examines how frontrunners in two (semi)public organisations engage with possible alternative futures in the context of complex challenges tied to sustainability, in these cases related to education and mobility. A processual perspective that focusses on how future-making unfolds over time and how it is embedded in organisational processes offers a valuable lens for addressing this question (Orlikowski & Yates, 2002; Van de Ven and Poole, 2005). Recognising that the future emerges from the interplay of past developments, imagined futures and present action (Emirbayer & Mische, 1998), I conducted three empirical studies to explore how organisations engage in imaginative work to organise a 'better' world today.

By adopting a practice approach to future-making, this research moves beyond static views of strategic planning and linear foresight, instead highlighting the emergent and iterative nature of future-making (Wenzel et al., 2020). Future-making

involves deliberate organisational efforts to anticipate, shape, and influence future conditions, in which imagination is an active, performative force that shapes the very practices organisations use to bring about the futures they envision (Beckert, 2013). Juxtaposing various alternatives to inquire into their differing performativity and consequences is crucial for responsible decision-making (Whyte et al., 2022).

This research focuses on the particular practice of ‘probing futures’, which is rooted in future studies and design methodology (Candy et al., 2019; Kinch et al., 2022; Kyffin & Gardien, 2009). It aims to foster possibilistic thinking, inquiring into alternative futures and challenging taken-for-granted organisational future-making. This particular future-making practice is further explained in the research context paragraph. The role of human endeavours in the practices under investigation is the main focus of this dissertation. I am aware, however, that these practices are not isolated from their broader social and organisational contexts. Indeed, the very aim of the practices in question is the transformation of these contexts (Mair & Seelos, 2021; Nicolini, 2016). As such change is ongoing, I aim to unpack the practices while emerging in ongoing transformations. This approach sheds light on the reciprocal relationship between imagination and organisational practice, illustrating how imagining alternative futures is both a driver of and shaped by the processes of future-making.

In doing so, this dissertation contributes to the broader discourse on organisational responses to grand challenges and the role of interplay between imagination and future-making practices in particular. It offers new insights into how organisations can engage in responsible future-making, not just in terms of addressing immediate needs but also in contributing to long-term societal and environmental sustainability. Ultimately, this dissertation aims to deepen our understanding of how organisations succeed and fail in re-imagining, shaping and enacting the complex futures that lie ahead.

In the remainder of this introduction, I present the theoretical background, positioning this dissertation in the literature on societal grand challenges and future-making practices. Subsequently, I introduce the scientific and practical relevance of this research. This is followed by the research context and approach, highlighting the practice of probing futures as part of the empirical setting and its relevance for understanding the interplay between imaginative work and future-making practice. Lastly, I give an overview of the three empirical studies.

1.2. Theoretical Background

1.2.1 Societal Grand Challenges as context for imagination and future-making

Societal grand challenges, such as climate change or global health crises, are complex, large-scale issues marked by interdependencies and systemic implications that require collaborative efforts across sectors and disciplines (George et al., 2016). Organisational scholars emphasise the urgency of tackling such challenges with transformative strategies to deviate from current pathways (e.g., Ergene et al., 2021; Ferraro et al., 2015). Recent events, particularly the COVID-19 crisis, highlighted how rapidly new grand challenges can emerge (Gümüşay et al., 2022; Howard-Grenville, 2021b) underscoring the need for proactive adaptable approaches.

In this dissertation, I equate ‘tackling grand challenges’ with ‘navigating complexity’ and extend this concept to related ‘wicked problems’, acknowledging that imagination is crucial in allowing organisations to discover and negotiate paths within unstructured complexity. In organisational literature, both grand challenges and wicked problems are seen as highly complex environments that organisations must navigate (Gümüşay et al., 2022). While originally presented as structured, measurable objectives, like the UN's sustainable development goals, grand challenges are now recognised as requiring adaptive, flexible approaches due to their evolving and often unpredictable nature. Pradilla et al. (2022) for instance show that intervening in the grand challenge of reducing poverty changed outcomes as well as its definition.

Cross-organisational ecosystems are essential for addressing grand challenges. Ferraro et al. (2015) advocate for ‘robust action’ through participatory architectures, distributed experiments and multivocal engagement. Similarly, DeJordy et al. (2020) use their ‘inhabited ecosystems model’ to show how insider activists across multiple organisations foster social change collaboratively. Howard-Grenville & Spengler (2022), however, recommend shifting from merely studying collaboration to critically examining the construction, persistence of grand challenges and the unintended consequences of actively addressing them. These scholars highlight the need for adaptive strategies, including imaginative approaches to “generate new ways of thinking and acting” and guide actors in understanding the nature of the issues they aim to address (Howard-Grenville & Spengler 2022, p.289).

As the understanding of grand challenges has developed, it is increasingly clear that imagination is essential to interpreting and shaping their dynamic and

ambiguous boundaries. This need for imagination represents a shift in perspective, reframing grand challenges from structured problems with identifiable cause-effect relationships to unstructured issues without a priori solutions and problem definition (Kurtz & Snowden, 2003). Scholars are encouraged to be diligent, bold and curious in addressing grand challenges (Howard-Grenville, 2021a) by conducting impactful phenomenon-based research (Wickert et al., 2021) and adopting a systems perspective (Grewatsch et al., 2023). Imaginative, future-oriented approaches are increasingly emphasised as essential for developing alternative futures (Gümüşay & Reinecke, 2022). In this dissertation, I focus on how organisations navigate the unstructured complexity of unknowable and unknown futures by applying adaptive, imaginative approaches that enable to explore ‘sideways’ rather than temporally forecast or backcast (Snowden & Rancati, 2021).

Imaginative work empowers organisations to actively shape alternative futures in the present, enhancing agency and promoting adaptability to evolving complexities. The shift to understanding grand challenges as unstructured and complex implicates the need for future-making approaches that embrace complexity and non-linear imagination to cultivate the adaptive strategies necessary for transformative change. In line with this, I see an opportunity to explore the role of imagination in future-making practices as they relate to grand challenges. Imagination is defined here both as a creative capacity to generate new forms and meanings beyond what exists and as a sociocultural process that creates collective realities (Komporezos & Fotaki, 2015). As a symbolic, relational and affective process, imagination enables individuals and organisations to construct alternative meanings, challenge dominant narratives, and envision new possibilities, thereby cultivating resilience and adaptive responses to complex societal issues (Fotaki et al., 2020).

Although traditional collaboration practices often constrain imagination to linear futures, reinforcing traditional paradigms, some grand challenges researchers are exploring new ways of thinking and enacting the seemingly impossible. Dey & Mason (2018), for instance, demonstrate how activist entrepreneurs such as the ‘Yes Men’ employ disruptive truth-telling to stimulate public debate. In a bogus newspaper, they prefigured desirable possible worlds, such as free university access and true pricing of goods challenging established social imaginaries (Dey & Mason, 2018). Hu & Rerup (2021) reveal how groups of actors with ‘foolish’ impossible goals benefit from proudly rebellious bonding that allows them to continuously challenge guarded societal institutions. Building further on March’s (2006) principle of foolishness, they argue such audacity is not just a tool for generating alternative

solutions but also a source of sustained motivation and ideas that question entrenched societal beliefs.

Engaging in new ways of 'seeing', driven by the capacity to imagine, has been referred to as 'seeing anew'. This shift can unlock transformative processes to grand challenges, akin to astronauts' overwhelming 'blue marble experience' upon viewing the Earth from space (Howard-Grenville, 2021a). Known as the 'overview effect', the resulting cognitive shift in the observer's self-schema often leads to profound value changes and inspires social and environmental activism (Rush, 2022; Yaden et al., 2016). Such shifts in perspective can catalyse systemic change by generating new actions that challenge deeply embedded societal values and beliefs (Mair & Seelos, 2021; Snowden & Rancati, 2021).

These psychological insights are relevant to my research for two reasons. Firstly, contributing to a sustainable society necessitates a shift in the socially construed value systems that currently underpin actions, highlighting the importance of individual cognitive schemas and frames as well as their interactions with societal and organisational structures. Secondly, research shows that 'positive trigger events' can be as effective as crises for such change (Rush, 2022). While this finding relates to an individual level, individuals are mutually constitutive of the organisations they inhabit. This finding suggests that rather than waiting for escalation, people and organisations can engage proactively in future-making practices that promote 'awakenings' and inspire shifts in value and belief systems.

Engaging in imaginative work is a way to proactively initiate awakenings and open up alternative future pathways. Imagination provides opportunities to proactively create serendipity events as suggested by Garud et al. (2018), setting conditions for emergence by introducing the opportunity tensions necessary for transformative change (Lichtenstein, 2014; Uhl-Bien & Arena, 2018). This imaginative shaping process fosters conditions for unexpected insights and outcomes to arise dynamically, similar to Golden-Biddle's (2020) abductive cycles triggered by surprising events. Hence, imagination enables organisations to cultivate multiple emergent possibilities rather than being confined to a teleological pursuit of predefined shared visions of desirable futures (Gümüşay & Reinecke, 2022; Sharma et al., 2022).

Thus, societal grand challenges do more than pose complex problems; they create a context in which imagination becomes essential for future-making. By embracing the uncertainty and complexity inherent in these grand challenges, organisations

can proactively cultivate adaptive, imaginative practices that not only address today's crises but also open pathways for shaping transformative futures.

1.2.2 Future-making Practices

The concept of future-making has gained renewed attention as a dynamic, contested, and inherently political process (Whyte et al., 2022). Future-making practices leverage 'fictional expectations' (Beckert, 2013) to negotiate and give form to present action (Wenzel & Krämer, 2018). Understanding transformative change in the face of grand challenges necessitates recognising the central role of political negotiation processes in shaping how actors and organisations orient themselves towards the future (Kornberger, 2013). As Wenzel et al. (2020, p.1450) note, the future as a "problematic, unknowable temporal category" in organisational life, fosters diverse future-making practices and perspectives, which "creates uncertainty about the appropriateness of organisational activities to be performed in the present". This uncertainty can inadvertently hinder people and organisations from pursuing alternative actions in the present.

Research on future-making practices seeks to understand how organisations employ forward-looking in conjunction with localised, everyday practices to intentionally shape the future, recognising that the future may push back. Drawing on practice theory (Nicolini, 2012; Schatzki, 2006), the practice approach is more than a research lens to study familiar organisational practices, such as traditional planning based on historical data (Durand, 2003; Urry, 2016) or process approaches that treat the future as inherently uncertain yet embedded into core daily routines (MacKay & Chia, 2013; Tsoukas & Shepherd, 2004). The practice approach views the future as emerging from an interplay between explicit forward-looking practices and mundane practices and studies this interplay accordingly.

Future-making practice research is positioned between plan-oriented 'building' approaches and process-oriented 'dwelling' approaches to future-making (Whyte et al., 2022). Building approaches, such as foresight and future-perfect thinking, are intentional efforts to achieve a desired future state or outcome (Pitsis et al., 2003; Tsoukas & Shepherd, 2004; Wenzel, 2022), guided by causation-like logic. Organisations set long-term goals and formulate strategies to reach them. This perspective emphasises agency and deliberate action towards a preferred vision of the future. Conversely, dwelling approaches, such as wayfinding or muddling through, are more flexible, responding to present circumstances with an effectuation-like logic that leverages resources and collaborative sense-making to navigate uncertainty (Chia & Holt, 2006; Lindblom, 1979). Positioning the

practice approach to future-making between these modes underscores the blend of deliberate imaginative work and emergent future-making practices shaping present actions.

Existing literature on future-making practice has theorised how imagination both catalyses and sets limitations for action as organisations temper their fictional expectations with credibility (Beckert, 2013; Rindova & Martins, 2022). Empirical cases of future-making practices often show teleological imagination processes producing and enacting rather conventional futures. For instance, Pettit et al. (2023) studied the case of restoring the performance of a sales and marketing subsidiary using imagination towards a desired future of collaboration. Alimadadi et al. (2022) studied the case of the restoration and renewal of the Palace of Westminster after a fire using imagination to keep away from this undesired imagined future. Comi & Whyte (2018) focuses on tangible representations to guide the imagination process for the design of a heritage site. While showing how imagined preferred futures shape present action within firm-centric core values, such cases overlook the intricacies of engaging with genuinely alternative future imaginations and the unprecedented ‘other worlds’ they disclose (Hovorka & Peter, 2021) ignoring a lack of imagination.

A lack of imagination can impede transformative shifts towards sustainability, as evidenced by historical developments since the Industrial Revolution. Economic paradigms have brought prosperity to many but also led to unintended consequences on a global scale, including environmental degradation. To illustrate, standardisation and consequential scaling in farming and food production have not eradicated hunger in the world but have led to the overproduction of waste and carbon emissions. If organisations restrict imagination to probabilistic pathways, they risk reinforcing existing trajectories instead of opening up alternative ones (Grimes & Vogus, 2021). Although future developments cannot be fully controlled, organisations should scrutinise how their actions influence the world around them more carefully.

To pursue sustainable futures, Gümüşay & Reinecke (2024) advocate for a “double leap” – embracing imagination over mere projection, and prioritising value-laden futures over value-neutral ones. While this double leap encourages the pursuit and debate of meaningful imaginaries, speculative theorising also introduces new constraints, which may over time become institutionalised and limit future possibilities. Thus, I see a need for future-making practices that both generate awareness of such constraints and empower actors to articulate alternative

futures. This dissertation investigates such future-making practices that aim to stimulate imagining alternative futures and scrutinising their potential for generating emergence.

Alternative futures, although often cognitively challenging due to induced anxiety (Hirsh et al., 2012), can be explored through designerly futuring approaches, which foster visceral, intuitive connections to possible futures (Auger, 2013; Forlano & Mathew, 2014). Using speculative futures and critical design (Dunne & Raby, 2013; Malpass, 2013) and experiential futuring techniques (Candy & Dunagan, 2017; Kelliher & Byrne, 2015), these approaches enable participants to experience possible alternative futures within the systems they inhabit. Engaging from within, rather than adopting an external perspective, involves interpreting one's entanglement with the system to discover the novel, simple idea that may already be governing the complex interactions one is a part of (cf. Wheeler as cited by Wheatley, 1993).

Experiential future-making practices are particularly valuable for raising awareness for existing action patterns and creatively exploring and scrutinising how they might produce and enact more desirable futures (Balcom Raleigh & Heinonen, 2019). Despite substantial theoretical groundwork on such practices (Hovorka & Peter, 2021; Riemer et al., 2023), empirical insight into how actors and organisations engage with them, how they flesh out and how they interrelate with other practices remain limited. This dissertation combines an organisational perspective on future-making as inquiry (Comi & Whyte, 2018) with futuring and design approaches to explore how organisations attempt to change course in future-making. It considers the interplay between imagining alternative futures and the future-making practices that create and enact them.

1.3. Relevance

1.3.1 Scientific Relevance

Transformative change towards sustainable futures requires organisations to break away from current unsustainable practices entrenched in institutionalised beliefs and value assumptions. As institutionalised patterns of action and thinking provide stability enabling people and organisations to function more or less effortlessly, they hinder flexibility and change (Kooijman et al., 2017; Lawrence & Phillips, 2019). This is particularly visible under the pressure of societal grand challenges and changing value orders in society as many organisations tend to linger in practices

no longer deemed appropriate rigidly applying neoliberal values (Beckert, 2020; Loorbach, 2022; Wright & Nyberg, 2017).

So far, grand challenges have been researched from a variety of perspectives such as institutional logics (Gümüşay et al., 2020), robust action (Ferraro et al., 2015; Gehman et al., 2022), temporality (Schultz, 2022), paradoxes (Jarzabkowski, Bednarek, et al., 2019). These perspectives have increased our understanding of the construct and particular approaches to tackling grand challenges (Howard-Grenville & Spengler, 2022). While future-making and imagination are inherent in such approaches, the study of the interplay between such practices has only just begun (Wenzel et al., 2020). Moreover, many scholars approach this interplay with teleological perspectives that emphasise preferred visions and goal-oriented behaviour (e.g., Pettit et al., 2023; Rindova & Martins, 2021; Sharma et al., 2022), which automatically projects the future distantly rather than confronting it in present activity. Additionally, the role of imagination is currently contestable as future-making scholars show that organisations tend to pull back imagination towards feasibility (Beckert, 2021; Rindova & Martins, 2022) and simultaneously scholars call for more paradigm-shifting creativity (Dey & Mason, 2018; Grimes & Vogus, 2021; Gümüşay & Reinecke, 2024; Sarasvathy, 2021) and moral imagination and leadership (Rindova & Martins, 2023; Solinger et al., 2020).

Following the actuality of these scholarly debates and the increasing sense of urgency for profound change in society, this dissertation answers recent calls for transforming organisational scholarship, its onto-epistemological lenses and tools (Ergene et al., 2021; Howard-Grenville, 2021b; Jarzabkowski et al., 2021) and extends that to practice. By conceptualising the lack of imagination as a pull-to-order problem, the research offers insights and empirical models about containing psychological discomfort invoked by stretching imagination sideways and cultivating creative tension between alternative futures and present realities (Study 1), proposes attending to relationality as a prerequisite for conducting values conversations bridging imagined alternative futures and everyday future-making (Study 2) and reinterpreting scaffolding practices as both cognitive and relational (Study 3). Additionally, from this research, the practice of probing futures emerges as an appropriate way to engage this shift from cognitive, content-related approaches towards a relational approach to address grand challenges and responsible organising (for) sustainability.

1.3.2 Practical Relevance

Taking grand challenges seriously requires organisations and individuals to change the paradigms that currently justify their actions. Although paradigms are powerful in resisting change, they do reflect the changes in how humans organise and interact with the world (Jasanoff, 2020). Organisations experience this as societal pressures, such as legal claims by activist groups, or changing legal rules and regulations for doing business. Additionally, the future pushes back through grand challenges that will eventually affect them. While these exogenous forces slowly invoke change, speeding up the process requires endogenous motivation and moral awareness (Rindova & Martins, 2023), but above all the capacity to imagine genuinely alternative futures and the courage to act on it.

This research recognises that organisations are trying to walk the thin line between yesterday and tomorrow – bridging pull to potentiality and pull to order (Figure 1). The pull to potentiality comes from a plurality of possible futures that may or may not become manifest through the choices made by people and organisations in the present. As they challenge the status quo, they offer opportunities for change. The pull to order reflects organisational responses that strive for stability and resist change. The activities with ropes and ladders in between represent deliberate efforts to navigate the challenges involved in connecting people and ideas about possible futures. By providing insight into the challenges of imagining genuinely alternative futures (Study 1), relationality – building strong relationships – as a prerequisite for conducting values conversations (Study 2), and recognising scaffolding practices as both cognitive and relational (Study 3), this dissertation aims to line up organisations, creative professionals, and research and education to participate in contributing to ‘better’ futures.

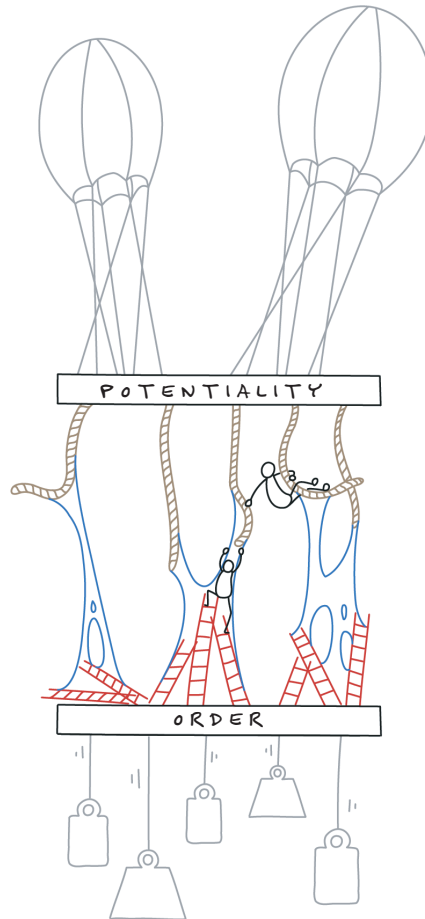


Figure 1 - The practical challenge of bridging pull to potentiality and pull to order

1.3.3 Societal relevance

The societal relevance of this research lies in advancing our understanding of how organisations can disentangle from institutionalised values and beliefs that hinder contributing to a more sustainable world. Too often organisations turn new paradigms, such as prioritising sustainable action, into business-as-usual (Wright & Nyberg, 2017). Grand challenges demonstrate non-linear progression and our limited control over long-term developments (Ferraro et al., 2015; Howard-Grenville & Spengler, 2022)). Recognising grand challenges as a direct result of human activity (Steffen et al., 2007) raises awareness of the shortcomings in the current economic growth and profit imaginaries that have historically guided approaches to the future (Beckert, 2020). Reports, such as the IPCC report, raise awareness of

the finite nature of natural resources, such as fossil fuels, and the impact of climate change, including extreme weather conditions and wildfires. In the digital age, inequalities in access to and gains from socio-technical systems and unequally distributed risks are becoming more visible, leading to changing social dynamics. Citizens are revolting against suppression and exploitation – e.g., the Arab Spring – or migrating in an attempt to improve their lives elsewhere – e.g., refugees from war, oppressive governments, or developing countries. These challenges have been identified as the double challenge of “environmental degradation and social inequality” that can only be alleviated by a deep transformation including “[a rupture of] the fundamental features of industrial modernity” (Kanger & Schot, 2019, p.16).

As sustainability and social issues become more widely recognised as priorities, questions are being asked about how effective current approaches are in achieving the profound change needed without inadvertently exacerbating existing problems or creating new ones (Kanger & Schot, 2019; Marquardt & Delina, 2021; O’Brien, 2016; Riedy & Waddock, 2022). For instance, Levy et al. (2016) show how the radicality of a change project for sustainable coffee starts high but ends low due to concessions from both incumbents and challengers. Boltanski & Chiapello (2005) demonstrate how new value systems, such as the projective order that celebrates the network economy, are merely new spirits of capitalism. Trittin-Ulbrich et al. (2021) introduce the ‘Organization’ special issue that explores the negative and unforeseen consequences of digitalisation on organisations and organising, in contrast to the prevailing view in mainstream research and corporate practice that digitalisation is a positive socio-technological process with numerous benefits.

Organisational scholars call to address these systemic challenges in a caring and courageous manner (Howard-Grenville, 2021a), and with a reinvigorated interest in imagination (Gehman et al., 2022; Gümüşay & Reinecke, 2022, 2024). Finding a way to connect with inconceivable possible futures is crucial to accessing alternative courses of action. The practice of probing futures central to this dissertation proves capable of eliciting action patterns that usually remain invisible for critical and creative inquiry. The insights in this dissertation aim to support organisations and individuals who take responsibility for their actions to contribute to ‘better’ decisions today.

1.4 Research Context and Approach

1.4.1 The Practice of Probing Futures

Transformative change requires that current patterns of action and assumptions about the future are disrupted. Imaginations of possible alternative futures influence such assumptions and patterns (Alimadadi et al., 2022). The practice of probing futures under study aims to discover surprising possibilities deemed worthy of amplifying by introducing experiential alternative futures into present discourse. As such, probing futures combines insights from speculative design (Dunne & Raby, 2013), design fiction (Bleecker, 2009) and critical making (DiSalvo, 2014) with insights from management and complexity theory (Kurtz & Snowden, 2003; Snowden & Rancati, 2021).

Probing as an emergent practice brings attractors in a system to unleash energy for change in three steps: probe-sense-respond (Kurtz & Snowden, 2003). It entails developing probes and arranging encounters, observing reactions and reflecting on emerging patterns, and organising adequate follow-up action, which could be doing nothing. As the organisational literature on probing practices reveals little on how probes are conceived, we draw in this research on future probes as provocative conceptual tools designed to stimulate dialogue and imagination concerning a range of possible futures (Hovorka & Peter, 2021; Kyffin & Gardien, 2009). An example is the smart connected glove for bikers that employs real-time personal emotional data to help them navigate busy cities safely (Figure 2). The key is that these future probes are not fixed ideas or solutions for practical implementation but experiential representations that give access to potential future worlds (Hovorka & Peter, 2021). Bringing these estranging objects in familiar environments temporarily collapses future time onto present reality, which evokes visceral, emotional responses and provokes questions about disclosed alternative value systems (Candy et al., 2019; Lockton & Candy, 2018). These questions may encompass inquiries into the emergence of new value systems, the challenges posed to existing values, the ethical dilemmas encountered, and the conditions under which such alternative futures might be deemed desirable. Exploring these questions is assumed to widen awareness of new possibilities, fostering unforeseen opportunities for actions in the present through intuitive embodied sense-making.

Probing treats the future as manifesting through intentional actions and decisions in the present while acknowledging the complex, dynamic and open-ended nature of the future. It aligns with a processual perspective on change regarding the world in a constant state of becoming (Tsoukas & Chia, 2002). Change emerges through

situated entanglements of actors in the world. Temporality is regarded as the unity of past experience, future expectations and action in the present (Emirbayer & Mische, 1998).



Probe name:
Citizen Emotion as data provider

Research question for this probe:
What if citizens science was the driving force in mobility design?

Research question for this probe:
“Objective science and data” are under pressure. Citizens no longer believe public authorities and data from renowned institutions. Citizens are assigned an active role in policy and execution by sharing their own measurement data.

Your emotional data improves safe biking in dense urban areas. The glove plugs you into the smart traffic control system collecting physiological data of your fright responses. It shares severity, geolocation and time with the municipality to improve unsafe routings. In return, the glove recognises patterns in your stressful journeys and redirects you with led-navigation. Do you feel safer already?



Figure 2 - Probe example

1.4.2 Empirical Settings

This research explores the practice of probing futures introduced above as a key component of future-making practices within two organisational settings. These (semi)public organisations share a common desire to innovate their organisation's future-making practices due to the realisation that their traditional methods of envisioning and shaping the future are insufficient to tackle the grand challenges facing society. Grand challenges, which are complex, unpredictable, and evaluative, present significant difficulties for organisations because of their intricate interactions, radical uncertainty, and evolving criteria that cross organisational boundaries (Ferraro et al., 2015).

The two organisations are involved in distinct yet related transformations – one focusing on digital transformations and the other on mobility. These transformations mirror the nature of grand challenges, requiring the organisations

to handle complexity, uncertainty, and diverse, shifting criteria. To address these challenges, both organisations adopted a curiosity-driven engagement with future probing practices. This aligns with organisations that conceive the future as a central concern in organising, struggling with its open-ended, complex and uncertain dynamics (Wenzel et al., 2020).

The first setting is a Dutch digital service provider to research and education, referred to as DigiOrg (Study 1). DigiOrg contributes to the responsible use of data and technology in research and education and the advancement of democratic, accessible and ethical digital practices. At the time of the study, the organisation was concerned with the potential threats to social equality in education posed by Big Tech's digital capitalist practices, as well as the impact of climate change on its future services, given the vulnerability of underground digital infrastructure to flooding.

Given DigiOrg's occupation with the digital transformation within semi-public domains, the organisation is bound to be involved in future-making (Kowalski et al., 2018). Despite its technological expertise and innovative image, DigiOrg faced the challenge of navigating rigid organisational structures. Such structures enable organisations to provide large-scale service but also hinders their ability to respond swiftly to emerging challenges (Uhl-Bien & Arena, 2017). Recognising these limitations, a group of three employees initiated contact with the co-design research group, of which I am a member, who proposed to embark on an explorative future probing journey. These frontrunners actively engaged with students and research staff in developing specific probes, aiming to open discussions on potential futures through collaborative experimentation.

The second setting, PublicOrg (Study 2 and 3), is a Dutch public organisation tasked with facilitating the development of future mobility solutions that are more sustainable, smart and climate-adaptive while being accessible and affordable. PublicOrg recognised that current innovative programmes, such as vehicle electrification and the use of extra-long transport trucks, may not bring about the radical changes needed to ensure a robust future mobility system.

Their public role mandates them to contribute to the transformation of society into a more sustainable one and address related societal challenges (Braams et al., 2021). The participants in this setting were a group of frontrunners who viewed their task as innovating their organisation's future-making practices. These frontrunners acted as brokers between the operational organisation and entrepreneurial

activities, both internal and external to the organisation. Mediated by external advisors, the frontrunners contacted the co-design research group ‘ordering’ the cooperation with students in the practice of probing futures. This collaboration aimed to concretise weak signals of societal change. The probing practice extended beyond the internal organisation, engaging a more diverse audience through (online) expositions and dialogues, which incorporated insights gathered from students’ probing activities with relative strangers before and during the pandemic lockdown. This second empirical setting unfolded over time as the site for exploring the follow-up activities after the cooperation with students (Study 2) and adjacent future-making practices of the extended frontrunners team (Study 3).

The empirical settings allow me to investigate *how* a change of practice in situations of ‘not knowing’ and a plurality of complex systemic interactions *evolves*, recognising that perpetuating familiar practices to produce and enact the future is not helpful in such situations. The frontrunners in both organisations were looking for a change of future-making practices and engaging in probing as a future-making practice in collaboration with students and research and education staff was part of their attempts to instigate this within their organisation. Hence, the probing practice is the unit of analysis and grand challenges the context.

1.4.3 Research Design and Methodology

The practice of probing futures central in this dissertation can be considered a practice in the making – dynamic, ongoing, and continuously evolving – that builds on tools and techniques from the experiential turn in futuring and design studies. Studying phenomena through the lens of practices in the making is considered particularly useful for reaching a rich understanding of the situated, embodied, and relational aspects of human action and interaction (Nicolini, 2012). Practices are evolving processes that both shape and are shaped by ongoing interactions and adaptations within specific contexts. Here a practice lens is particularly helpful to shed light on how interactions between human actors and the featured probes are deeply entangled with cultural norms, historical legacies, and social relations. Applying this lens to study the phenomena of the interplay between imagining alternative futures and everyday future-making reveals the intricate entanglement of such future-making practices and their intersections with broader societal dynamics and aspirations (Wenzel et al., 2020).

Taking a practice approach aligns with my engaged scholarship perspective (Van de Ven, 2007) during the three studies. I was deeply involved in practising future probing as a lead co-design researcher together with members of the focal

organisation of Study 1. This gave me a 'withness' perspective (Fachin & Langley, 2018) to capitalise on during analysis. A 'withness' perspective allowed me to deeply engage with participants' lived experiences, fostering a collaborative process of meaning-making and understanding, as opposed to maintaining a detached, objective stance. In Study 2, I had an engaged perspective observing most activities in real-time, although partly online during pandemic restrictions. Study 3, an organisational ethnography, zoomed out to the broader practices encompassing the future probing approach of Study 2. Due to COVID-19 restrictions, part of the second probing study and almost the entire organisational ethnography was conducted online. These circumstances forced me to study practices and processes mediated through digital devices, facing impediments like limited embodied experience and out-of-sight side conversations (Akemu & Abdelnour, 2020).

The three studies together aim to advance our understanding of the interplay between imagining alternative futures and everyday future-making practices. This is a key aspect in the practice of probing futures but is known from practical experience as a potential breakdown. Focusing on the activities and relationships between actors and objects and zooming in on future probing practices and zooming out to adjacent practices, this dissertation will illuminate the challenges actors and organisations encounter. Challenges and breakdowns in the practice are "openings for accessing the *significance* of the internal workings of a practice" (Sandberg & Tsoukas, 2011, p.347, original italics). The research took an emergent design as circumstantial events, such as the pandemic, influenced the course of developments (Hammersley, 2022). Emergent design fits with the exploratory character of researching the phenomenon of connecting between future imagination and future-making practice and emerging difficulties.

Data were collected at the two organisations during and, in the second case after they had engaged in future probing practices. At both organisations, data consisted of observations, interviews, archival documents and digital captures of tangible artefacts. The first body of data was gathered during a two-year longitudinal study (Langley et al., 2013) in which a core team of 3 to 5 members of the focal organisation cooperated with 3 codesign researchers, including myself, and different groups of students. Data consists of over 120 hours of participatory observations, 9 interviews and archival data entailing 75 documents varying from snapshots to presentation slides and instruction booklets. Observations were captured in digital notes, reflective communications, video footage, and photos at two one-week bootcamps, four co-design sessions, two four-week probe labs and 18 core team meetings. Interviews were conducted midway by phone captured

by note taking and at the end of the trajectory face-to-face, audio recorded and transcribed verbatim. The interviews varied from 30 minutes to 60 minutes. Informal conversations during two bootcamps were documented in field notes, and student artefacts and insights were captured for analysis.

The second body of data was gathered during a two-year longitudinal study, partly obtained by participatory observation during probing events similar to Study 1 and including 18 months of organisational ethnography (Ybema et al., 2009). Probing-related data consisted of 44 hours of real-time observations captured in 12 hours of audio-visual footage, digital notes and 206 photos, 7 one-hour interviews captured by digital note-taking and archival data containing over 230 documents varying from organisational documentation on weak signals to presentation slides to student-produced insights. Ethnographic data consisted of 140 hours of mostly online meeting observations captured in over 600 pages of handwritten notes –digital capture was not granted - complemented with 10 recorded and transcribed interviews and notes from informal conversations at the few meetings on location. Archival data entailed access to 90 exchanged documents, 126 intranet items, over 1500 WhatsApp group messages and 42 weekly e-mails by the team's manager. Study 2 was based on data captured during probing events and coinciding organisational ethnography. Study 3 was based only on data from organisational ethnography.

The interpretive analytical approach (Henwood & Shirani, 2022) in all three studies is phenomenon-driven following an initial hunch of problematic interplay between imagination practices and future-making practices. As the research has an exploratory character involving practice in the making, the analytical process is iterative and takes abduction as a guiding principle. Going back and forth between our data and the literature enabled an abductive analysis in which our interpretations were informed by theoretical sensitising concepts (Bowen, 2006), while the choice of concepts was data-driven (Timmermans & Tavory, 2012). At the heart of abductive analysis is identifying surprising patterns in the data (Bamberger, 2018).

While rigour can be challenging in interpretive, abductive research, I tackled this in three ways throughout the studies. First, I consistently approached the data in a similar and transparent manner. I started with visual mapping (Langley, 1999) to create detailed timelines of the probing journeys and in the organisational ethnography of several future-oriented project journeys the organisational members were committed to. This enabled me to bracket recurring patterns of

activities and identify critical events or break-downs to zoom in on. Composite narratives of the journeys and detailed vignettes of typical observations (Jarzabkowski et al., 2014; Langley & Abdallah, 2011) were written to interpret the meaning of the observed. Second, I engaged in intensive discussions with my supervisors, who, with their diverse backgrounds in organisation studies and design studies, took the role of devil's advocate to challenge my interpretations and probe for any biases. Third, preliminary interpretations of the organisational members' activities were member-checked in communicative validation sessions. Furthermore, earlier versions of the paper-based chapters have been confronted with scholarly scrutiny at several academic conferences.

1.4.4 Research data management and research ethics

All data collected for my dissertation, including observation notes, interview recordings and transcripts, informal conversation notes, and documents, were handled with strict confidentiality. Digital data were stored on a two-factor authentication-protected virtual drive owned by HU University of Applied Sciences Utrecht. Access to the data was restricted to authorised researchers only. Additionally, data retention and disposal were managed in line with HU's institutional guidelines. The research has been registered in HU's GDPR-compliant research registry.

The research in this dissertation adheres to principles of integrity, committing to transparency in data representation and avoiding conflicts of interest. While the HU ethical review board was still in its provisional phase at the time, I discussed my research setup with its members to ensure compliance with ethical standards. Although no formal approval document was issued, the research was conducted following the guidance provided during this discussion. In discussions with my supervisors, we took the utmost care to safeguard confidentiality while providing rich qualitative details.

1.4.5 Structure of the Dissertation

This dissertation consists of three empirical studies (see Table 1 for an overview). Study 1 explores the challenges in imagining and connecting alternative futures with everyday future-making. Adopting a practice lens to study an established organisation practising future probing, which involves stretching imagination towards unsettling alternative futures, exposes tensions arising from organisational pull to order responses like accountability and solution orientation. These tensions, surfacing as differing cooperation approaches, varying levels of trust, timing issues, and the integration of exploration with regular tasks, found temporary *containment*

through enabling activities fostering a sense of togetherness and trust. This study shows how the practice of future probing is capable of producing the conditions necessary to generate emergence, – container, difference, exchange (Eoyang, 2001, 2007) – by ‘doing futures’, and unravels the relational aspects of these tensions that can be contained to endure rather than reduce the cognitive dissonance invoked by unsettling alternative futures.

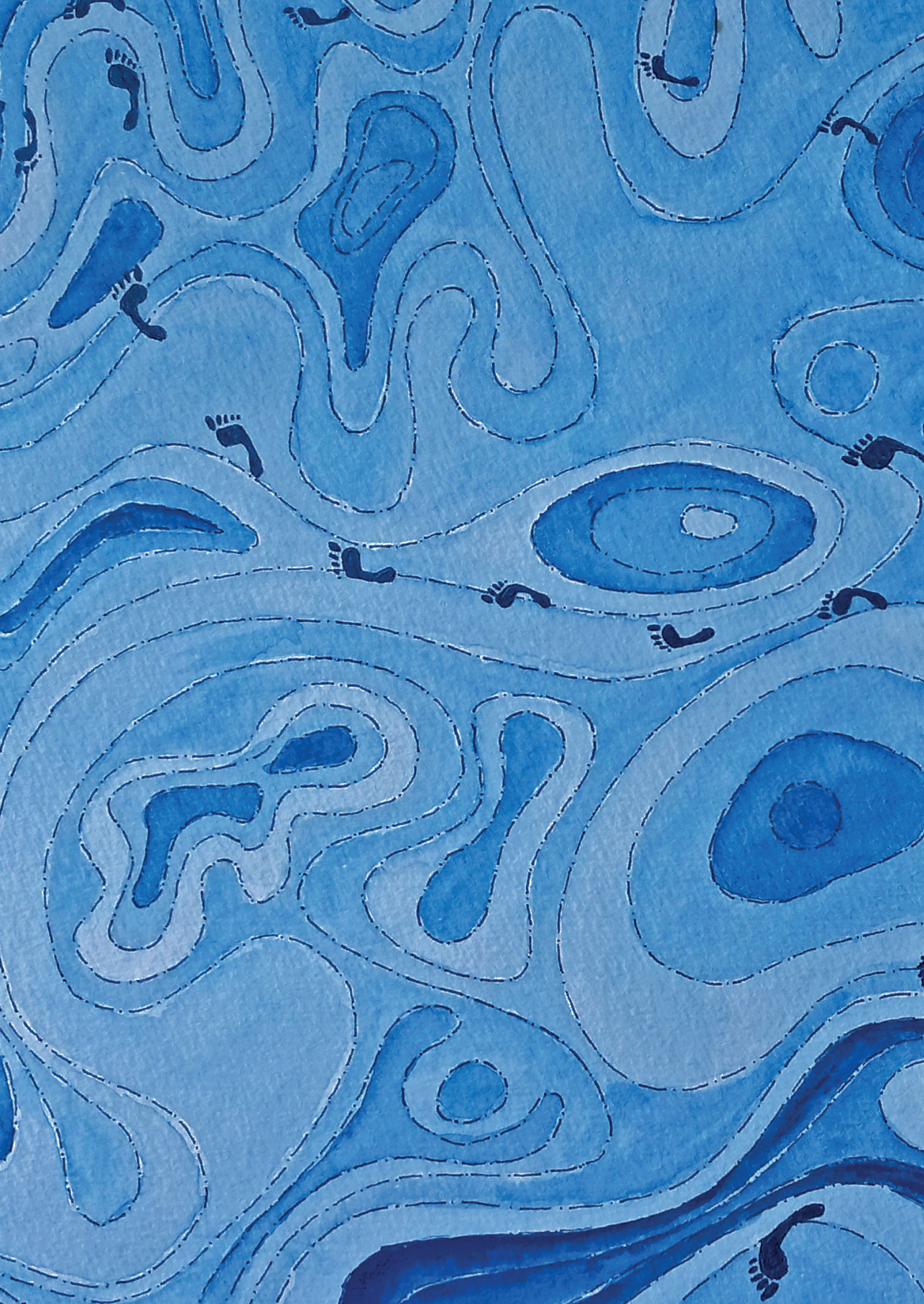
Study 2 expands our understanding of values conversations in connecting alternative futures imagination with everyday future-making. It unpacks how values conversations in practising future probing are shaped by competing mechanisms across three realms of future-making. In the irreal and as-if real realm, we found that probing practices stimulate stretching sideways and adapting mechanisms during values conversations by offering direct lived experience with alternative possibilities. Contrarily, failing to offer such lived experience in the real realm in combination with switching from probing practices to analytical practices invoked dodging mechanisms in values conversations. Reasoning that cognitive relating to proposed alternative futures was challenging, this study shows a need for *empathic interrelating* as a prerequisite for connecting alternative futures imagination with everyday future-making through values conversations.

Study 3 explores how actors shape the interplay between present realities and imagined alternative future possibilities. Building on the notion of scaffolding from knowing in practice, the study unpacks scaffolding practices that actors engage in to build narrative structures and create conditions to bring emerging alternative possibilities into being. While supportive structures usually concern *cognitive scaffolding*, this study adds the importance of *relational scaffolding* given the unsettling experiences invoked by imagined alternative futures.

Table 1 - Overview of the three empirical studies

Subquestions & Design	Empirical data
1) Why is it challenging to imagine and connect alternative futures with everyday future-making? Single case study future probing practices at Digital Service Provider	– 2 full weeks of participatory observations during 2 bootcamps, – 13 hours co-design sessions – 21 hours core team co-meetings – 2 probe labs, captured in field notes and reports; – 5 interviews by phone with employees, captured by note-taking; – 4 interviews face-to-face with organisational probing team members, recorded and transcribed verbatim; – 75 documents, ranging from artefact snapshots to instructions, slides and reflective communications
2) How does imagining alternative futures shape and get shaped by values conversations in future-making? Real-time case study – future probing practices at Public Organisation	– 44 hours of real-time participatory & ethnographic observations, captured in digital notes and partially in AV footage; – 7 interviews, of which 6 recorded and verbatim transcribed, – 230 documents produced (approx. 500 pages) during probing, including student work (partially webpages) – informal (telephone) conversations, and archival data, including
3) How do actors shape the interplay between emerging alternative possibilities and present realities? Organisational ethnography (mainly online due to Covid19 restrictions) – future-making practices at Public Organisation	– > 180 hours of mainly online ethnographic observations, captured in approx. 800 pages of handwritten and 300 pages of digital notes – 13 recorded and transcribed interviews, – informal (telephone) conversations and mailings – archival data, including 90 exchanged documents and access to intranet

Key findings	Conference papers
Four tensions increasing over time and across probing stages signalling limited containment: organising exploration next to normal work, varying approaches to cooperation, timing and tempo differences, varying trust in the approach.	Previous version discussed at 11 th International Symposium on Process Organization (PROS), 2019, Chania, Greece Short paper version accepted at 36 th EGOS colloquium, 2020, Hamburg, Germany (Track cancelled due to COVID-19)
Three realms of future-making constituting different challenges and competing mechanisms that influence how values conversations are performed: stretching sideways vs self-censoring in the unreal realm, embracing vs dodging in the real realm, and adapting vs mere surviving in the as-if real realm.	Previous version discussed at 14 th International Symposium on Process Organization Studies (PROS), 2023, Chania, Greece
Relational scaffolding is prerequisite to cognitive scaffolding in shaping the interplay between emerging alternative futures and present realities. Four mechanisms: envisioning, concretising, confronting and containing.	Previous versions presented at 13 th International Symposium on Process Organization Studies (PROS), 2022, Rhodes, Greece 39 th EGOS colloquium [SWG] Shaping Desirable Futures – Imagining (Real) Utopias, 2023, Cagliari, Italy



2.

Containment Tensions in Probing Alternative Futures

Abstract

Organisational future-making practices contribute to how the future unfolds and societal grand challenges are addressed. As future-making is a contested, dynamic and political process, it matters what kind of futures are imagined. Simultaneously, non-linear dynamics tend to induce barely conceivable futures. Research has revealed that most organisations tend to turn future ambitions into business as usual, yet our understanding of why it is difficult for organisations to imagine genuinely alternative futures and act upon them remains limited. Taking a practice approach, this research studies how a semi-public organisation in cooperation with students and co-design researchers probes possible alternative futures and seeks to connect with daily future-making practices. We found four containment tensions in relation to the pressure invoked on the organisational system by the probing practice, which hamper imagination and connecting to daily practice. Providing a model on managing containment during the practice of probing futures, this research enhances our understanding of 'doing' futures to generate emergence rather than formulating shaping intentions to devise teleological strategies. The practice of probing futures performs futures - doing - to trigger reflection - thinking – whereas most approaches focus on cognition to inform action. Earlier versions of this chapter were discussed at the PROS symposium and accepted for the EGOS colloquium as:

Earlier versions of this chapter were discussed at the PROS symposium and accepted for the EGOS colloquium as:

Maessen, C., Lauche, K. & Van der Lugt, R. (2019). *Future probing: Practices for exploring and anticipating far and near future uses of digital technologies*. Paper for PDW at 11th International Symposium on Process Organization Studies (PROS), Chania, June 19-22.

Maessen, C., Lauche, K. en Van der Lugt, R. (2020). *Future probing practice for radical innovation: collaborative knowledge creation about the future*. Short paper accepted at the 36th EGOS colloquium, Hamburg (track cancelled due to COVID-19).

2.1 Introduction

Organisations have a crucial responsibility in addressing grand challenges as they have to a large extent produced them (Gümüşay et al., 2022), but are also in a powerful position to imagine and engineer alternative futures (Beckert, 2021). According to the World Economic Forum, challenges such as climate change, natural resource depletion and social inequality require a fourth industrial revolution towards a bio-inclusive economy to restore or adapt to the degradation of natural systems driven by human activity (Cassar et al., 2018). As organisational choices in science and technology determine to a large extent how new imaginaries arise (Jasanoff, 2020), and their expectations of the future play a performative role in socio-technological developments (Geels & Smit, 2000), it is imperative to understand how organisational future-making practices produce and enact the future (Wenzel & Krämer, 2018).

In this explorative study, we examine a particular future-making practice based on a non-linear, pluralistic and processual approach to futures. The practice of ‘future probing’ makes use of probes (Kyffin & Gardien, 2009), or artefacts from the future (Hovorka & Peter, 2021), to bring imagined futures into current inquiry (Whyte et al., 2022). The practice aligns with experiential futures that “engage people more viscerally in futures conversations” (Candy & Dunagan, 2017, p.137). While the practice has been theoretically grounded in a processual ontology recognising the temporal unity of past, present and future (Riemer et al., 2023), it lacks empirical insights on how organisations put it into practice. Practising future probing requires actors to stretch their futuring muscle to produce ‘probes from the future’, and such probes need to stimulate imagination about new or other value orders and worldviews to be able to break away from current unsustainable paradigms. This study is guided by the research question:

Why is it challenging to imagine and connect alternative futures with everyday future-making?

Although organisations have always used their imagination to guide their activities, traditional approaches to managing the future within the dominant paradigm of progress and economic growth are currently contested (Beckert, 2020; Levy & Spicer, 2013). Deviating from current unsustainable pathways to the future calls for approaches embracing the complexity of systemic challenges and uncertainty of future developments (Ferraro et al., 2015; Grewatsch et al., 2023). This implies the need to abandon linear ways of thinking about the future as extrapolating past

and present knowledge and experiences usually yields few surprising alternatives. Wenzel et al. (2020) argue that organisations have rediscovered the future as open and unknowable, but also that this non-linear pluralistic view problematises their attempts to engage with such futures.

Non-linearity and systems thinking is thriving in several discourses within organisation studies since the complexity turn (Urry, 2005), such as strategic change (MacKay & Chia, 2013), time and social change (Reinecke & Ansari, 2015), adaptability leadership (Uhl-Bien & Arena, 2017), responsible innovation (Scherer & Voegtlin, 2020), future-making (Comi & Whyte, 2018; Wenzel et al., 2020) and grand challenges more general (Ferraro et al., 2015; George et al., 2016). With respect to transformative change, it is also incorporated in contemporary discourses in disciplines like future and design studies (Kossoff et al., 2015; Slaughter & Hines, 2020). Future and design studies tend to focus on appropriate methodology development, while organisational discourses focus on how organisations develop alternative courses of action towards achievable near-future goals.

Combining organisational perspectives, particularly on emergence and self-organisation (Eoyang, 2011; Lichtenstein, 2014), with practices from the experiential turn in future and design studies (Candy et al., 2019) allows us to study how organisations practise more intuitive future-making to discover unstructured, complex domains through probe-sense-respond cycles (Kurtz & Snowden, 2003) while stretching their futuring muscle to reach beyond orthodox futures (Dey & Mason, 2018). Intuitive approaches treat future imagination in direct connection with everyday future-making practices – i.e., how the future is produced and enacted (Wenzel et al., 2020) – instead of envisioning possible future directions and backcasting teleological pathways to such futures (Sharma et al., 2022). Our integrative approach advances current perspectives on future-making practices in the context of complex societal challenges (Gehman et al., 2022).

A practice lens to future-making draws attention to the interplay of imagining futures and mundane activities through which actors give form to the future (Wenzel, 2022; Wenzel & Krämer, 2018). Although scholars have theorised qualitative differences in future imaginations, distinguishing psychologically distant from near futures (Augustine et al., 2019), orthodox from disruptive futures (Dey & Mason, 2018) and probabilistic from possibilistic thinking (Grimes & Vogus, 2021), most empirical research overlooks such differences focussing on teleological processes rendering firm-specific future visions performative (e.g., Comi & Whyte, 2018; Pettit et al., 2023; Thompson & Byrne, 2022). While some acknowledge non-

linear dynamics in these processes, goal-setting based on shared visions limits the range of possible futures and pathways to imagine (Snowden & Rancati, 2021).

Rindova & Martins (2022) posit that firms explore the boundaries of creative imagination, but they also assert that distant imaginations will always be tempered by plausible productive imagination due to specific organisatory attributes, such as “distinctive resources, capabilities, and strategic intentions” (p. 12). Interestingly, the authors equate distant future imaginations with desirable futures, bearing on the idea that distant future imaginations draw on people’s values. Contrary, Alimadadi et al. (2022) show that undesirable future imaginations guide people’s current decision-making as well. Moreover, what is desirable is contested, changes over time and the future may manifest in completely different forms than expected as the emergence of grand challenges due to human activity illustrates. Taking such considerations into account requires a better understanding of the complex entanglements between actors and their ideas about a variety of futures as such imagined futures and the attention they receive assert agency on present action.

We advance the research on future-making practices in two ways. First, our study highlights a holistic systems approach to future-making, probing alternative futures to generate emergence of novel interaction patterns and change. As such, the approach emphasises ‘doing futures’ which integrates future possibilities with lived experience on a visceral, emotional level. Second, we provide insight into the challenges involved when conducted in an established organisation. We found containment tensions to signal an underlying pull to order in response to the practice of probing possible alternative futures hampering its progress. We also found enabling activities to contain such tensions allowing actors to endure raised psychological discomfort during the probing practice and the process to continue.

We also contribute to the literature on organising (for) sustainable futures more generally, by highlighting that transformative change towards a ‘better’ future requires actors in organisations to learn to trust intuition-driven artistic approaches as justified tools for action. While this approach may be counterintuitive for most actors in prevailing rationally-driven organisational settings, governed by agendas, schedules, deadlines and procedures, we claim that it opens up fixed mindsets to see their current world with new eyes. After all, it is seeing anew that generates transformative change (Howard-Grenville, 2021a).

2.2 Theoretical Background

Organisations have always been using the future to shape their present actions. How they perceived the future has changed over time from pre-determined in pre-modern times to plannable and even controllable in early and organised modernity to pluralistic and unknowable in late modernity (Wenzel et al., 2020). According to Wenzel et al. (2020), the plurality of thriving future-making methods, producing a wide variety of images of the future, creates uncertainty about which course to pursue which causes organisations to struggle with engaging with the future.

The multiverse of methods is discernible by different purposes (e.g., prediction, planning, critique or inquiry) and underlying epistemic assumptions about the future – i.e., discovering the future, creating the future and imagining futures (Hovorka & Peter, 2021; Riemer et al., 2023). While discovering and creating relate to Wenzel et al.'s (2020) rational plannable and controllable futures emphasising a linear temporality to a single future, the plural account of futures in imagining acknowledges that diverse alternative futures are possible and plausible (Riemer et al., 2023). Given the desire to deviate from current pathways to the future, such non-rationalistic methods (Whyte et al., 2022) could potentially guide the search of organisations in the multiverse of future-making practices and images of the future.

2.2.1 Future-making Practices

The practice approach to future-making has been proposed to draw attention to the various actual ways in which actors in organisations bring the future into being (Wenzel, 2022) in response to the disqualification of the future as manageable through rational planning practices (Wenzel et al., 2020). It draws attention to the performative practices and artefacts that shape and are turned into realisable courses of action. Emphasising the making mode, Comi & Whyte (2018) position the future-making perspective somewhere between a more rational building mode to the future, such as foreseeing and future perfect thinking (Pitsis et al., 2003; Tsoukas & Sheperd, 2004) and a dwelling mode to the future as in wayfinding practices (Chia & Holt, 2006). In the building mode, “the future can be ‘talked into being’ through deliberate planning or learning”, (Comi & Whyte, 2018, p.1076), through cognition and sensemaking processes. The dwelling mode emphasises habituated actions, based on the entwinement of humans and non-humans with the world, from which spontaneous order emerges (Comi & Whyte, 2018). The intermediate approach of future-making draws attention to the interplay of imaginative ‘thinking’ work in building and shaping ‘doing’ work in dwelling.

The emerging literature on future-making practices reveal how organisations use narrative shaping intentions (Pettit et al., 2023; Rindova & Martins, 2022), practical knowledge (Thompson & Byrne, 2022) or visual artefacts (Comi & Whyte, 2018) to shape pathways towards preferred futures. Contrary, Alimadadi et al.'s (2022) research on the restoration of Westminster Palace show how imaginations of undesired futures, such as a previous fire, enable organisations to develop pathways that avoid such futures. While this work recognises that pathways are negotiated, the empirical cases reveal that directionality is determined by a priori goal-setting. This draws attention to imaginative work that fits such goals but does not address the broader field of possibilities beyond such rational and feasible futures.

In an attempt to theorise more non-rationalistic approaches to future-making, Whyte et al. (2022) conceptualise future-making as inquiry. Grounding their conceptualisation in pragmatism and phenomenology they see future-making "as a distributed and reflective process that proceeds through engagement with representations of the future" (p.3). Topical in times of COVID-19 measures, Whyte et al. (2022) focus on typical online threats to shared experiential knowledge leaving unaddressed the broader difficulties of stretching imagination towards genuinely different alternative futures in collaborative practices. Hovorka & Peter (2021) emphasise the need for visceral responses to experience that the future is "already at work in the present" (Peter et al., 2020, p.4). Their use of artefact from the future as triggers for rethinking possible futures aligns with futuring approaches that aim to establish collective rethinking of future possibilities (e.g., Candy & Dunagan, 2017). To our knowledge, the approach was not yet geared to confront organisational challenges or studied as an organisational future-making practice. In our study, we do take a practice perspective on future-making and regard the use of 'artefacts from the future' as an inquisitive approach as suggested by Whyte et al. (2022).

Maintaining an inquisitive mode is relevant from a systemic perspective on complex challenges in which probe-sense-respond cycles are proposed as the way to move forward (Kurtz & Snowden, 2003) which aligns with Whyte et al.'s (2022) inquiry approach to future-making. Complex challenges are entangled, unstructured and open-ended. Treating them as structured challenges and attempting to control or 'fix' them through expertise and rational planning is a common pitfall in managerial practices. Drawing on future-making as an inquiry approach, we focus on the empirical difficulties in imagining and connecting alternative futures with daily future-making practice.

2.2.2 Imagining Alternative Futures

In this study, we build on Augustine et al. (2019) who point us to the qualitative distinction between psychologically distant and near futures. This distinction is based on Trope & Liberman's (2010) construal-level theory and is in line with a quantum approach to time. This construct from complexity theory reverses the arrow of time regarding the future as flowing towards the present as infinite potentialities (Lord et al., 2015). We also align with Augustine et al. (2019) arguing that distant futures gain concreteness and as-if reality through dialectic processes of contestation and synthesis rendering them taken seriously. We contend though that by asking how these as-if-real future imaginations might lead to implementation, they imply an underlying linear structure of time. We therefore choose to refer to *alternative* futures to emphasise a non-linear leap to a 'parallel timeline' and distinguish them from conventional futures.

The qualitative distinction between near and distant, or conventional and alternative, futures is not based on a leap in the time dimension but on the perceived psychological 'distance to lived experience' (Trope & Liberman, 2010). Conventional near futures are constructed along a linear pathway into a foreseeable future extrapolating past and present experiences into concrete and detailed constructs, while alternative distant futures break away from current pathways using creativity and imagination to arrive at abstract, high-level constructs (Augustine et al., 2019). The psychological construct of 'distance to lived experience' is valuable for our conceptualisation of *alternative future imaginations* as it supports the concept of 'estrangement' that we explain later in this section.

By reversing the arrow of time, the present, undone from its typical linear position between past and future, becomes an attraction point in time-space in which futures from any direction become manifest when meeting the right circumstances¹. The degree of freedom to imagine a wide variety of potentialities is unlimited when one pictures alternatives far from the present. When potentialities approach the present though, they meet constraints in the present (e.g., organisational structures or human expectations) which render some futures more likely than others to become manifest (Lord et al., 2015). To become performative, less likely futures require creative human agency to withstand such constraints or to create incidental anomalies in the otherwise recursive patterns that more or less perpetuate the

¹. Michel Serres pictures this as a crumpled handkerchief that treats time in a topological manner as opposed to the metrical geometry of a line or a flat ironed handkerchief. It allows two distant points on the handkerchief to become instantly near and even superimposed as one crumples the handkerchief and two near point to become instantly distant as one tears them apart.

status quo. As temporality in a quantum perception of time is “formed through its own patterns of becoming rather than through the imposition of a preformatted geometry” (Wilkie et al., 2017, p.4), this perspective enables us to attend to non-linear timespace processes from which *alternative futures* may emerge.

This conceptualisation of ‘alternative future imaginations’ is leveraged in speculative engagements with future probes or ‘artefacts from the future’. Probes carry meaning about internally consistent and coherent alternative future worlds into the present context to be critically scrutinised (Hovorka & Peter, 2021). We contend that the distance on the time dimension, as implied by the managerial language of horizons, is not relevant here. What matters is their psychological distance from lived experience (Augustine et al., 2019; Trope & Liberman, 2010), which makes them “cognitively plausible but estranging” (Hovorka & Peter, 2021, p.1737). Moreover, the artefacts themselves are not the object of inquiry in terms of their feasibility. They rather disclose unprecedented constellations of socio-technological, cultural, ecological and other values to become approachable for dialogue, contestation and negotiation through active embodied engagement (Hovorka & Peter, 2021).

Our conceptualisation of alternative future imaginations is rooted in the approaches to future studies that emphasise doing imaginative futures in the present (see Hovorka & Peter, 2021, appendix A for an overview). Hovorka & Peter (2021) contrast imagining futures with rational ways of discovering (e.g., forecasting) or creating (e.g., foresight) the future. Riemer et al. (2023) discount such approaches as ontologically too substantialist, temporally too linear and relying too much on individualistic agency. Drawing on Heidegger, these authors suggest the ‘artefacts from the future approach’ to align with a strong process view of change, emphasising historical and ongoing processes and underscoring the dynamic nature of time and collective agency in shaping and being shaped by potential futures. In this perspective, “futures are actively imagined and socially relatable” (Riemer et al., 2023, p.3). Change, according to a process-oriented ontology, involves “the reweaving of actors’ webs of beliefs and habits of action as a result of new experiences obtained through interactions” (Tsoukas & Chia, 2002, p.570). This perspective suggests that through imaginative work, actors engaging with a multitude of possible futures in a continuous state of becoming, render some futures manifest thereby enacting change. As such, it draws attention to doing imaginative futures rather than thinking about them.

This performative perspective aligns with the perception of time as a unity of past, present and future (Emirbayer & Mische, 1998). As future time is folded onto present time (Hovorka & Peter, 2021), it so to speak, deactivates the time dimension of future imaginations as something far away. This 'elimination' of temporal depth allows actors to critically engage with imagined futures as they are through fully embodied situated experiences without the need to project oneself into an imagined future or to imagine what great-grandchildren might experience in time. Expectations about how far away in time imagined futures are become irrelevant as no temporal translation is required (Rindova & Martins, 2022). More importantly, by tangibly and experientially manifesting psychologically distant futures in the present, actors can inhabit the future worlds they represent (Hovorka & Peter, 2021). Making alternative futures tangible and experientially relatable, while also introducing elements of unfamiliarity, tends to evoke immediate embodied emotional responses (Lockton & Candy, 2018). These aspects turn tangible experiential future representations into performative stages for individuals to rehearse and explore different ways of engaging with these futures (Foverskov, 2020; Oomen et al., 2022), including the possibility of rejecting or modifying them (Balcom Raleigh & Heinonen, 2019).

To summarise, we direct our gaze in this research to performative future-making practices that integrate thinking and doing by bringing non-linear alternative futures tangible and experiential into the present, invoking a stage for rehearsing possible futures and critically scrutinising their implications. We do so from a processual stance on change and transformation regarding the world in a continuous state of becoming (Tsoukas & Chia, 2002). While the future manifests in situated practices where knowledgeable actors exert agency through present choices, the future itself has agency as imagined futures influence such decisions but also as the result of unforeseen and unprecedented consequences of actions in the past.

2.2.3 Containment

The notion of containment refers to creating conditions that hold actors together within a boundary. It is used in complexity thinking to indicate the difference between chaotic and complex or structured systems (Snowden, 2005). It explains how particularly human systems behave when pressured for change and offers means for enabling change more organically. The notion of containment is rooted in Bion's psychoanalytical theory, where analysts served as a container for confusing uncertainties of their patients and their interventions provided containment of feelings of psychological anxiety. In organisational change management it is associated with containing uncertainty-induced emotional

responses among collaborative groups of actors (French, 2001). In human system dynamics, containment, diversity and exchange are conditions for self-organisation in organisations as complex relational systems (Eoyang, 2001, 2007). Diversity refers to significant differences between actors, which creates generative tension for potential change. Exchange refers to the transfer of information, energy or material between actors that potentially transforms system-wide patterns (Eoyang, 2001). Containment relates to the container that distinguishes a system from its context providing a boundary in which significant differences and transformative exchange can thrive. A container connects actors on a principle of similarity that binds them as a group, such as a membership, a culture, a project or the walls of a physical space. Without it, actors dissipate and there is no foundation for significant differences or transformative exchange between actors (Eoyang, 2001). Actors are typically involved in many entangled containers. In our case the container is the practice of probing futures that holds together those engaged in the practice over time.

While a container may be as simple as the boundaries of a room or working on the same mission, we build on more complex and less tangible forms of 'holding actors in a system together' (Ladkin, 2013). Ladkin (2013) considers containment to refer to the leadership capacity of psychologically containing followers' affective and emotional responses to stress and change. The author builds on Merleau-Ponty's phenomenology of perception and the notion of 'flesh' when she refers to the material and bodily aspects of between-space that keep such relational dynamics between leaders and followers going. While Ladkin (2013) provides examples of containment capacities of specific leaders, leadership in complex relational systems is foremost 'collective, relational and distributed' (Uhl-Bien, 2021). It follows, that within a system's container, anyone can take leadership to contain affective and emotional responses among actors within the container.

Applying the concept to cooperative future-making practices, we use the term "containment" to refer to the material and bodily aspects of between-space among those participating in the practice of probing futures. This shared space acts as a container holding them together as they engage in the practice. For instance, the generative tools supporting participants through the probing journeys, the specific manager's stature attracting more participants or the informal bonds between the core team and employees. Identifying issues of containment is important to sustain the practice of probing futures.

2.3 Methodology

We set out to understand why it is difficult to imagine and connect alternative future imaginations with daily future-making practices. In our case study at DigiOrg (pseudonym), we introduced a designerly practice that focused on materialising and inquiring into possible alternative futures by making them tangible through ‘probes’. These probes, or artefacts from the future, were developed by students and part-time participating employees and served as an entry point to unprecedented future worlds for inquisitive purposes (Hovorka & Peter, 2021; Whyte et al., 2022). Probes were designed provocatively to trigger dialogue within the organisation about possible new constellations of values, their desirability and impact relevant to the organisation (Kyffin & Gardien, 2009) as well as reflections on institutionalised beliefs and assumptions (Malpass, 2013). Studying how DigiOrg incorporated this practice of probing futures to change current ways of organisational future-making, we consider the probing futures an “emergence praxis” aiming to pursue or enact the emergence of more sustainable futures intentionally (Lichtenstein, 2014, p.396).

While the researchers had some experience with ‘probing futures’ in other settings, both researchers and organisational frontrunners valued that this was a cooperative endeavour to explore and learn how to use such an approach. The cooperation was intended to last two years but ended earlier. As such, this case is a relevant exemplar to study the discrepancies between the intended and the actual processes as indicators of possible tensions accumulating into the final breakdown. Following the hunch that the tensions were inherently linked to the unsettling aspects of probing alternative futures, we focused on unpacking tense situations to discover patterns in relational dynamics that drive or impede practice.

2.3.1 Research Context

As a semi-public organisation supporting Dutch research and education in digital development since the 1980s, DigiOrg desired to take responsibility for sustainable future endeavours in this field. Being a technology-driven organisation, DigiOrg was already seeking to understand the relation between novel technology and sustainable futures. For instance, they invited a climate expert to discuss the possible consequences for digital infrastructure of major floods. Departing from their historic innovative DNA, however, the entrepreneurial turmoil of the early years had been replaced with structured processes and procedures even for innovation projects. While this allowed them to flourish for decades, some employees (referred to as frontrunners) now searched for ways to return to the

Table 2 - Data sources Study 1

Data type	Participants	Description	Analytical use
Participatory observations at 2 full-week Bootcamps	P1.0: 7 employees & exhibition visitors, 20 students, 3 co-design researchers P2.0: 7 core team employees & 6 embassy members & exhibition visitors, 15 students, 3 co-design researchers	Informal conversations with both students and participating employees captured in field notes and online shared log, some captured on video footage. Photos of by students created artefacts.	Understanding obstacles and enablers encountered with the probing practice and in the cooperation between students and employees. Understanding of the content of the probes and process.
Participatory observations at 4 half-day Co-design sessions	Employees: 4 to 9 Co-designers: 3	Facilitated sessions making sense of weak signals to prepare input for students. Making sense of probing deliverables. Captured in photos and field notes.	
Participatory observation at 1 one-hour Evaluative session & 1 two-hour Validation workshop	Employees: 2 Co-designers: 2 Employees: 4 Co-designers: 2	Process evaluation after P1.0, video recorded and verbatim transcribed. Validation of research findings after breakdown; captured in fieldnotes and photos.	Open and thematic coding, context mapping annotating process journey map (Figure 3).
Participatory observation at ± 30 hours of Core team meetings	P1.0: 3 employees P2.0: 7 employees	Process design and development captured in field notes and partial video recordings.	Writing a narrative account, Establishing visual timeline (Figure 4-5).
Interviews: 5 midway telephone ± 40 min 4 after breakdown, face to face, ± 60 min	Employees involved in Bootcamp P1.0 Core team employees P2.0	Reflective interviews process obstacles and enablers and surfacing relevant probing themes. Reflective interviews process obstacles, enablers and feelings, generative prompts*; audio-recorded and verbatim transcribed.	Open and thematic coding, surfacing tensions Vignette writing Establishing visual timeline (Figure 4-5).
Archival data: 75 documents,	Ranging from artefact snapshots to instructions, slides and reflective communications.	Student documentation and reflections. Core team communications and log. Co-designers log.	Verify our interpretations of employee behaviour from student perceptions; Annotate process journey map (Figure3). Scrutinise for illustrative examples.

* A project activities timeline to prompt interviewees' reminiscence of events. The interviewees added for instance emoticons to discuss their feelings over time and green and pink sticky notes to distinguish enablers and obstacles.

innovative nature and attitude that enabled them to engage with the future in more flexible ways. The desire to revive the entrepreneurial mindset on the work floor led them to cooperate with the research group Co-design (referred to as co-design researchers) to explore designerly approaches in collaboration with students for their fresh perspectives. DigiOrg appreciated co-design as stimulating generative method that initiates a collaborative and iterative design process where participating stakeholders are actively involved in creating relevant outcomes.

A team of three (later five) frontrunners teamed up with two (later three) co-design researchers, among whom the primary researcher of this study. As the 'core team', the frontrunners and co-design researchers designed, organised and led a two-year cooperative trajectory (Figure 3) to explore unknown and uncertain futures in light of the data revolution, assuming that providing bandwidth for institutions would no longer be their core task. Imagining alternative futures was central to this trajectory, and it was assumed that such explorational processes would attract employees to engage with the future and to take their experiences to their everyday work. The trajectory consisted of 2 one-week bootcamps, surrounded by 4 co-design sessions, 2 four-week probe-labs and 15 core team meetings. While students played an important role in the creative approach to imagining alternative futures, this study seeks to understand the perspective of organisational actors in such future-making practices. Therefore, student activities and behaviour will only be addressed in relation to their interplay with organisational actors. This case study follows the core team responsible for developing the two-year trajectory (referred to as the 'probing journey' or 'journey') focusing on the organisational frontrunners in this team.

2.3.2 Data Collection

We gathered longitudinal process information over two years to study how the probing journey unfolded over time (Langley et al., 2013) engaging in participatory observation, analysis of documents and artefacts developed during the process and interviews. Data collection gradually increased as the probing journey unfolded and changed from evaluative data after the first bootcamp to ongoing reflective process data. During observations, the primary researcher took the role of participant observer as part of the co-design team. Due to this participatory role in the design interventions (Sanders & Stappers, 2014), data were partially auto-ethnographic (Vesa & Vaara, 2014). For instance, the researcher posted personal reflections to the core team's online reflective journal and the co-design researchers' communication channel on processual insights during the journey. Furthermore, the researcher took part in and documented evaluations of the core team. During the bootcamps,

co-design sessions and core team meetings we prompted participants to express, discuss and elaborate on their thoughts and feelings using generative design tools and artefacts as part of the intervention method (Sanders & Stappers, 2014). The results have been captured physically or in photographs. Table 2 gives an overview of the data sources during two probing iterations – P1.0 and P2.0 – and how they were used in analysis.

2.3.3 Data Analysis

The data were analysed in five steps using an inductive approach.

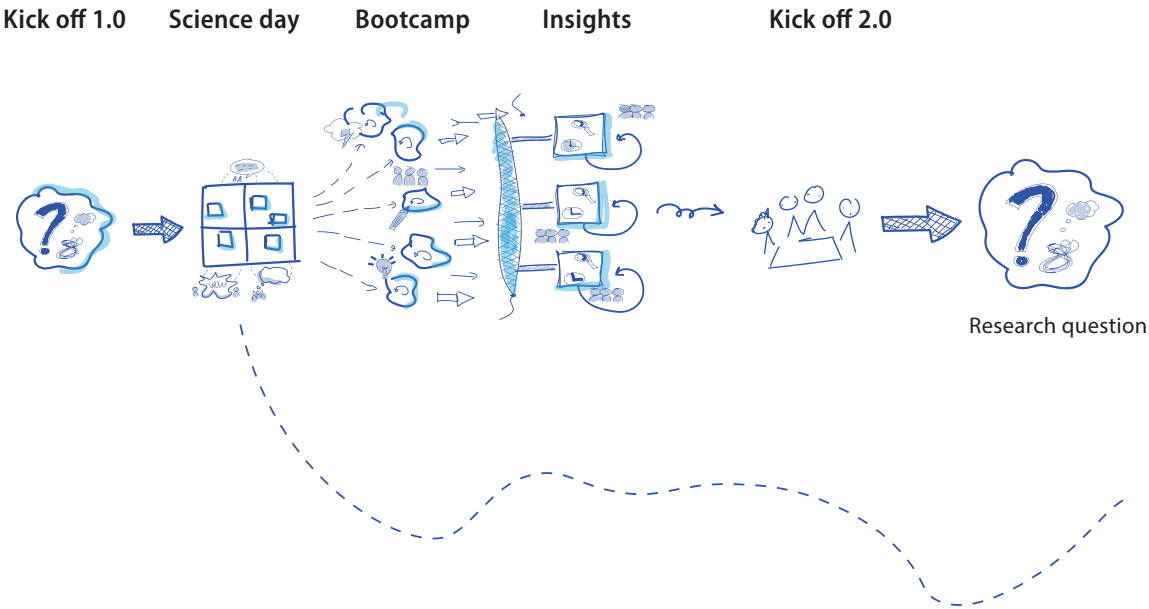
First, we revisited the evaluative research conducted at the end of the probing trajectories in which a learning history approach (Bradbury & Lichtenstein, 2000) had been applied to reflect on participants' learning and change efforts. At the time, co-design researchers had connected concrete actions and general knowledge about operation and innovation networks in organisations and the need for enabling leadership to navigate those (e.g., Uhl-Bien & Arena, 2017). We now used the annotated journey's visual timelines (Figure 3) to create a narrative account of the 'probing journey'.

Using temporal bracketing (Langley, 1999) we compared the two probing iterations, probing 1.0 and probing 2.0, and distinguished roughly similar consecutive processes discerning consecutive phases of 'sensing', 'stretching', 'interpreting' and 'deepening'. 'Sensing' the present (A) involved co-design sessions with frontrunners and employees to elicit what is going on in their professional field. Relevant themes formed input for bootcamps with students 'stretching' to alternative futures and capturing employees' responses (B). This was followed by co-design sessions for 'interpreting' the implications of such ideas about the future with frontrunners and employees (C) and probe labs with students for further 'deepening' themes (D).

In the second step, we zoomed in on how participants perceived the unfolding probing journeys. Our database entailed both raw data capturing participants' views from evaluative sessions and interviews and secondary data like documentation produced by the co-designers (including the PhD researcher) for evaluative purposes during the probing journeys. We open-coded the interviews with frontrunners and embassy members of probing 2.0. Clustering coded fragments revealed four tensions which we identified as 'varying approaches to the cooperation' (T1), 'varying trust in the approach' (T2), 'differences in timing and tempo' (T3), and 'organising exploration time next to regular work' (T4). Thematic coding of the recorded and partially transcribed evaluation session of the probing

Probing 1.0

A - sensing B - stretching C - interpreting



Probing 2.0

A - sensing

B - stretching

C - interpreting

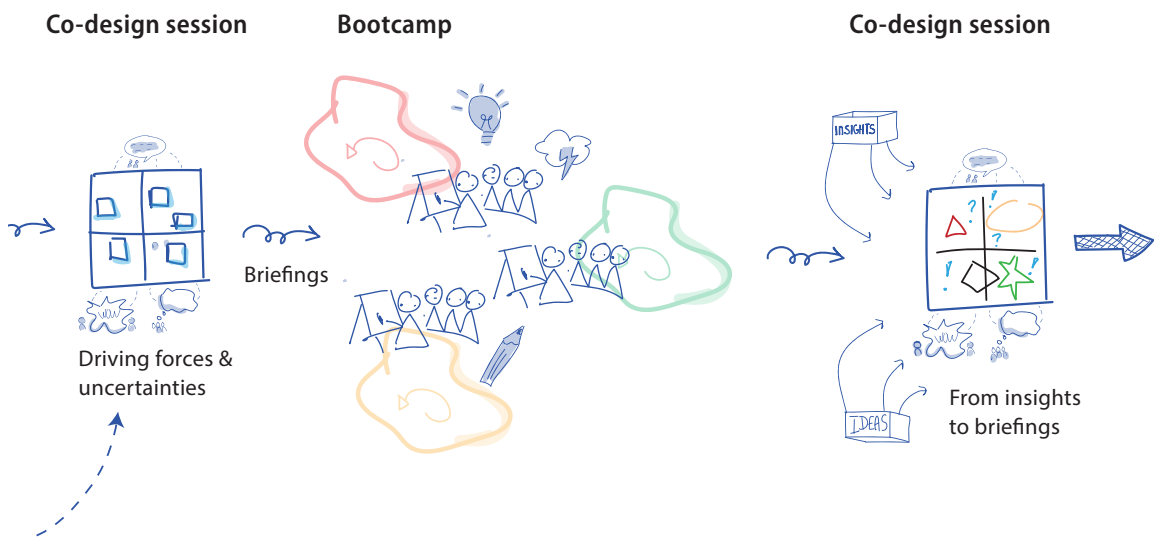
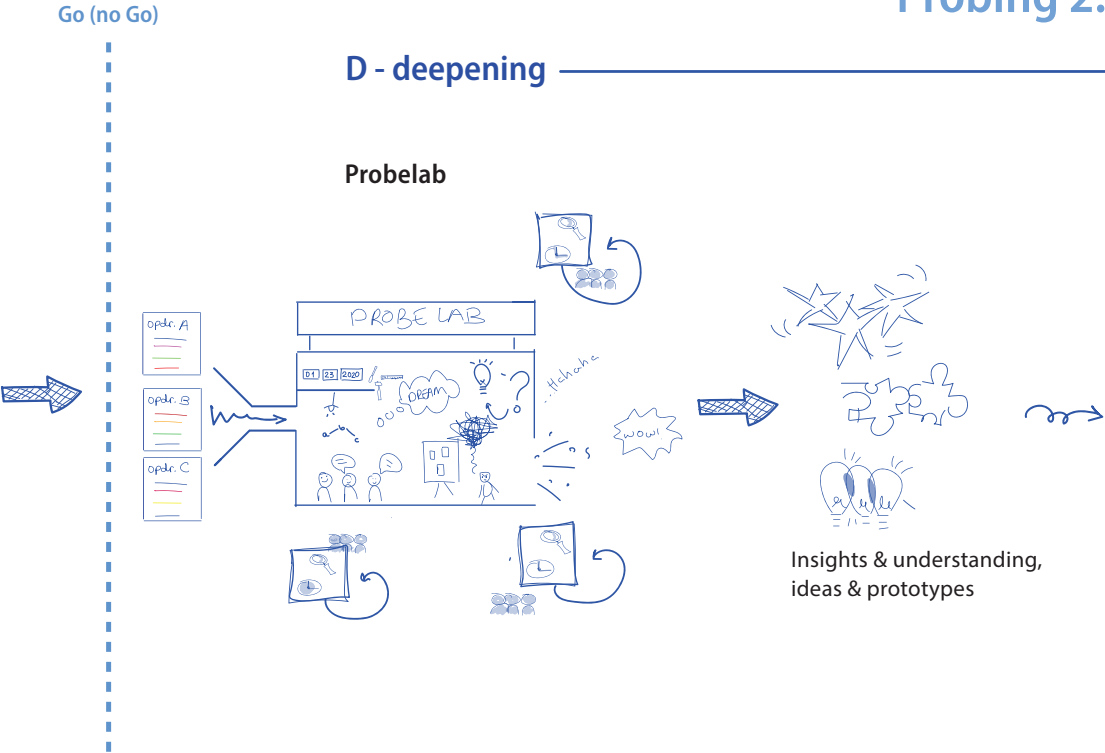


Figure 3 - Designed probing journey

Probing 2.0

D - deepening

Probelab



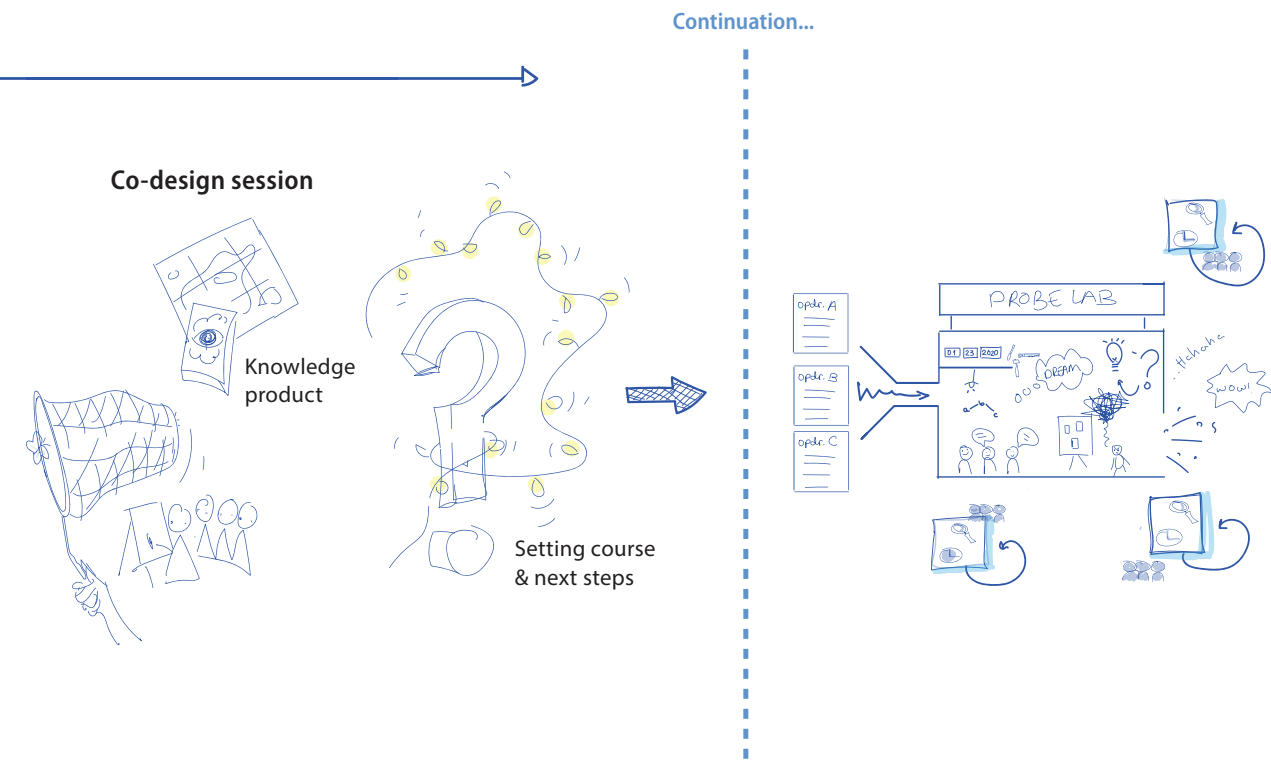


Figure 3 - Designed probing journey

1.0 journey confirmed these tensions without revealing other tensions. We found further evidence for these tensions in secondary documentation that reflected on enablers and obstacles for the practice of probing futures that had been member-checked with the frontrunners in a validation workshop. During the validation workshop, identified enablers and obstacles were plotted on the visual timeline (Figure 3) and discussed with the frontrunners in terms of conflicting exploration and operation activities and the challenges and opportunities of connecting the two rather than balancing them separately (Uhl-Bien & Arena, 2017). The frontrunners' recognition that identified obstacles reside within this connection challenge in their organisation led us to further interpret the functioning of both obstacles and enablers in the tensions emerging during the probing process.

In the third step, we produced a more fine-grained visual map (Langley, 1999) to identify patterns in the tensions (T1-4), enablers and obstacles over time and across phase (A-D). The map (Figures 4 and 5) shows the sequencing of events dispersed over three layers – envisaged process, actual DigiOrg process and actual Co-design process – which we crafted from the data. The Envisaged process displays the process as designed ahead and adjusted in an ongoing development process, the actual DigiOrg process displays the actual involvement of DigiOrg frontrunners, and the actual Codesign process displays the involvement of the co-design researchers.

Critical event analysis of discrepancies between the process layers allowed us to plot the tensions on this visual map as they occurred over time and to couple previously coded fragments as obstacles and enablers to these tense situations. While we expected to find mainly obstacles to link to the tensions, we surprisingly also found enablers to link to the tensions.

Obstacles seemed to indicate a tendency for more structure and control, while enablers seemed to drive the creative probing process further. Revisiting the literature on adaptability and leadership led us to distinguish obstacles as 'order responses' – i.e., pulling towards structure and control – and enablers as 'enabling activities' – i.e., investing in conditions for emergence and self-organisation – (cf. Uhl-Bien & Arena, 2018). Order responses typically reside within organisations when the status quo is challenged generating tension and conflict. Enabling activities help to use such tension by 'playing in the tensions' and linking up different ideas, perspectives or worldviews (Uhl-Bien, 2021). Borrowing these concepts from the literature on adaptability and leadership, we plotted these responses as they related to the identified tension in the visual map. We recognised in the fluctuations of obstructing order responses and smoothing enabling activities varying levels

of alignment or togetherness that had been important in driving forward the cooperative future-making journey at DigiOrg. The graph at the bottom of Figures 4 and 5 shows an overall decline in these fluctuations.

At this point in the analysis, we came to realise that the ‘tensions to play in’ as put forward by Uhl-Bien & Arena, (2018) were raised on two levels in our case. As expected and intended, the provocative future probes developed by the students raised substantive uncertainty, as they challenged institutionalised beliefs and values. Consequentially, a ‘pull to order’ in the organisation was expected too. On top of that though, the probing approach itself raised uncertainty as it was novel and even completely outside the comfort zone of the involved actors. Part of the process was a learning-by-doing approach to probing alternative futures. The co-design researchers used generative tools to collaboratively design and develop the probing process, for instance, ‘paper-based swimming lanes’, 3D figures and activity-icons were used to generate ideas for involving different types of employees before, during and after the student bootcamp. Other generative tools were developed and used to guide participating employees and students through the designed probing process. Such tools were meant to provide structure and support in an uncertainty and anxiety-raising process. While this approach enabled actors to realign their togetherness regularly, the overall declining pattern over time (see graph in Figures 4-5) indicated the frontrunners and co-design researchers drifting apart.

This insight compelled us to interpret the approach itself as a ‘meta’ probe - a novel way of engaging with uncertain possible futures surrounded with uncertainty about the probing practice itself. As such, the probing practice generated pressure on the organisational system in line with the expressed purpose of employing the practice of probing futures to shake up the innovation mindset at DigiOrg. We used this insight to guide our further unpacking of the relationship between tensions, order responses and enabling activities, and a decline of togetherness.

In the fourth step, we zoomed in writing vignettes (Langley & Abdallah, 2011) about events that illustrated the tensions in relation to both order responses and enabling activities gave us a detailed understanding of the declining togetherness as the probing journeys evolved through the identified phases of sensing, stretching, interpreting and deepening. This decline of togetherness, observed and reported in interviews with core team members, prompted us to conduct a literature search on the dynamics of relational ‘between space’ (Bradbury & Lichtenstein, 2000; Ladkin, 2013). We theorised the interplay between tensions, order responses and levels of togetherness in the cooperative future-making practices in terms of a lack of

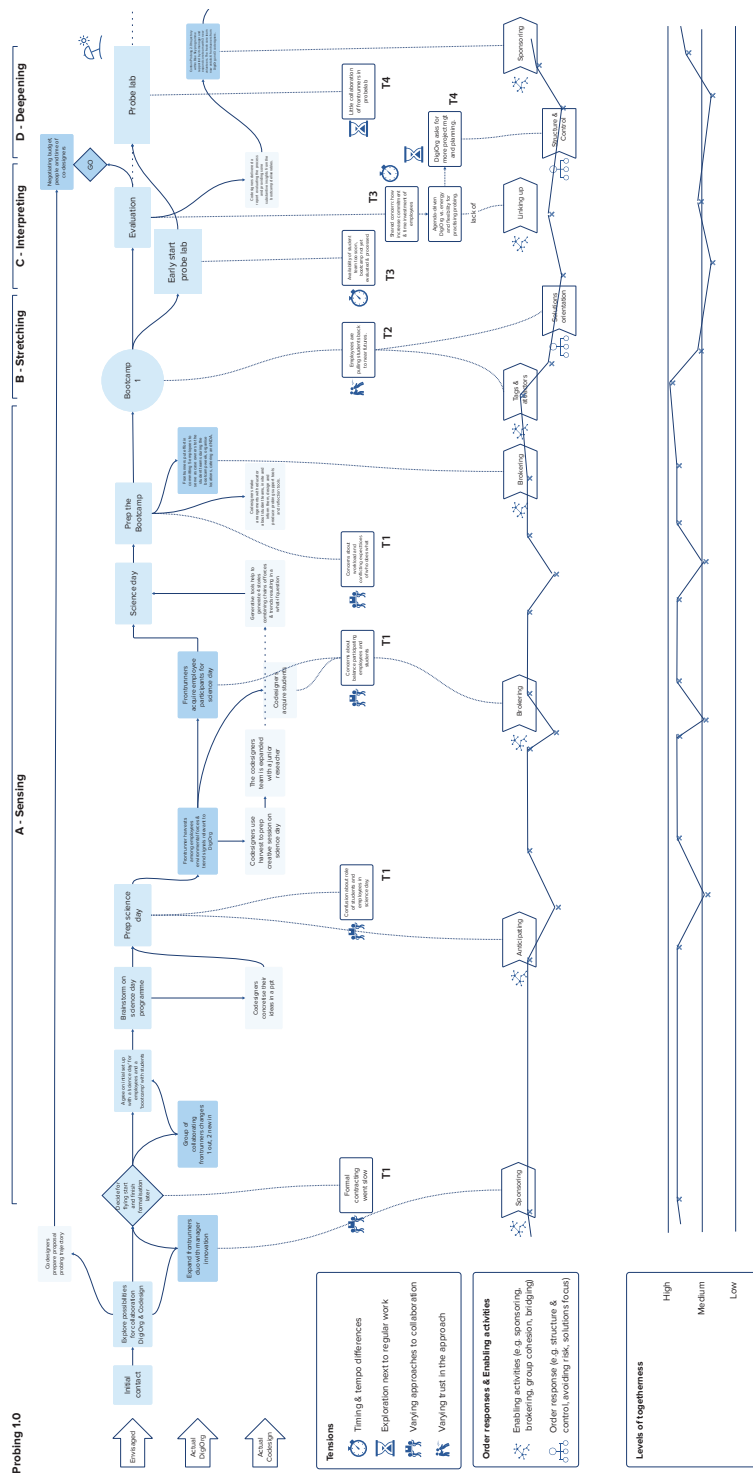


Figure 4 - Events, tensions, order responses, enabling activities and togetherness

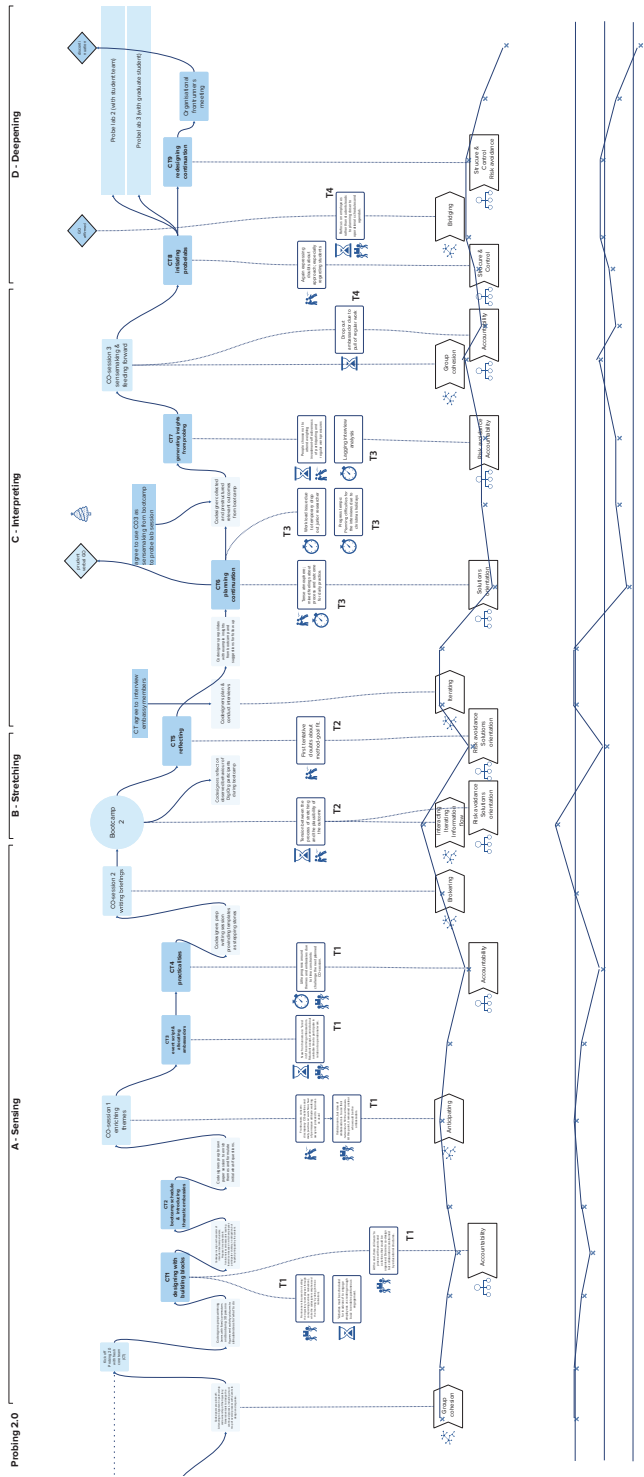


Figure 5 - Events, tensions, [...] and togetherness (continued)

containment – i.e., providing a psychologically safe space that holds actors together in a system's container (Ladkin, 2013). The container in our case contained those involved in the future probing journey. This was a small group at the beginning, but the intention was to expand the practice involving more and more employees across the organisation.

Finally, by zooming in to analyse specific manifestations of tensions and zooming out to relate them to temporal moments on the visual timeline we gained a deeper understanding of the differences and similarities of recurring patterns (Nicolini, 2012). We developed a process model for managing containment in the practice of probing alternative futures. It explains how specific containment tensions are triggered by typical order responses to the different phases in future probing – i.e., sensing, stretching, interpreting and deepening. It further emphasises the importance of considering whether such order responses are appropriate and how to act accordingly either keeping the probing practice going as future-making or pursuing other approaches. In the following sections the identifiers depicted in Figures 4 and 5 are used to relate analysis and findings, e.g., 1.0-A-T2 refers to Probing iteration 1.0, Phase A, Tension 2.

2.4 Findings

In this section, we show how the practice of probing alternative futures elicits both order responses and enabling activities that produce an interaction pattern of accumulating tensions and declining togetherness (Figures 4-5). While fluctuating over time, this overall pattern increasingly impedes the core team's cooperative future probing practices until termination. The tensions *varying approaches to the cooperation* (T1), *varying trust in the approach* (T2), *differences in timing and tempo* (T3), and *organising exploration time next to regular work* (T4) surface consecutively during the probing phases in both probing journeys. Over time, tensions are triggered by order responses and more or less contained by enabling activities. At the end of the second iteration though, these tensions culminate in uncontainable levels leading to the termination of the cooperation.

Below we illustrate the build-up of tensions across phases in the probing practice with situated examples from the case zooming in on the specific order responses and enabling activities and their effect on the interplay between tension and level of togetherness. In three vignettes, we particularly focus on the tension of trust in the approach, as we conceive this tension linked to the inherently unsettling character

of the approach of probing alternative futures. Note how in the beginning of both iterations, the high level of togetherness allows the core teams to produce enabling activities to accommodate and even play in the pressures evoked by the probing practice, while over time the prevailing order responses reinforce the tensions and inhibit enabling activities leading to a break-down in the togetherness.

2.4.1 Probing Iteration 1.0

The first iteration had a kick start as the cooperation between DigiOrg's frontrunners and the co-design researchers could build on the relationship of trust between the two initiators who had previously cooperated. While this cooperation was set up between the co-design researchers and the frontrunners, it was considered a prerequisite that students would be involved for a fresh perspective and to create buzz on the work floor. The co-design researchers would bring their expertise and experience in engaging with more alternative futures and incorporate student activities in the intervention method. The frontrunners would bring in expertise on relevant topics and current practices of the organisation. The core team of frontrunners and co-design researchers would develop, organise and lead the interventions during the probing journey as partners equally responsible for its success. In this iteration, they agreed to develop a Science Day around an existing Science lunch meeting to formulate different futuring cases and attract so-called case owners to participate in a Bootcamp week with students to explore and concretise the cases. We underline this mutual understanding at the start as a baseline from which tensions and order responses increase and togetherness drops.

To set the baseline, we demonstrate how trust in the approach and level of togetherness is high at the beginning, and enabling activities to tensions outnumber order responses. Vignette 1 exemplifies how Enabling Activities (EA) (cf. Uhl-Bien & Arena, 2018) mitigate initial concerns about the way of cooperating (T1). High levels of togetherness stimulated enabling activities that inhibited potential order responses and prevented tension from escalating. This kept trust in the approach (T2) sufficient and maintained high levels of togetherness. In this phase, enabling activities contain any uncertainty and confusion that had raised order responses among employees in the organisation.

Vignette 1 - (Un)expressed assumptions

In one of the core team meetings, it becomes clear that the co-design researchers' past experiences with similar trajectories steer the design of the process, which the frontrunners sometimes have difficulty following. Featuring co-design researchers Roy and Karen, and frontrunner Evan, this tension surfaces as 'confusion' about the organisation of Science Day for which they had previously brainstormed some 'wild ideas'. The purpose of the current meeting was to organise and plan the programme. After exchanging some practicalities about the programme, Roy and Karen ask Evan to harvest among employees what they consider drivers and trend signals relevant to DigiOrg. They gently request swift action as they need it to prepare for the co-design session at Science Day. Evan responds that he might be able to do it during next week's meeting. Roy suggests a quick inventory using sticky notes to be sufficient which triggers Evan to start a conversation on the suitability of sticky notes for the task. Karen joins the conversation explaining the purpose, but Evan refuses to conduct the harvest.

On the verge of entering a fierce discussion, Evan wholeheartedly expresses his underlying concern:

"I thought we would take a guerrilla approach to surprise and confront employees.... that the students would query them about future probes during the lunch meeting, and now we are asking employees to invest a whole afternoon in an extra session. (T1) I think it will be difficult to have people participate as they will compare them to previously experienced sticky notes sessions with no follow-up. Our employees are very avoidant towards activities that do not directly contribute to their daily practices and targets. (T2)"(evaluation P1.0).

Putting this openly on the table initiates several enabling activities. Evan sponsors (EA) the initial 'wild ideas' that he thinks have already been tempered a bit by introducing a sticky notes session. Evan also anticipates (EA) responses from the organisation that might counteract the efforts to get them engaged. This anticipation provides the co-design researchers a chance to leverage (EA) the frontrunners' practical knowledge into the approach. Evan agrees to go along with it when the co-design researchers promise that sticky notes will only be deployed for the quick harvest to get relevant input from the employees. The Science Day itself will have a more creative spirit. Herewith they restore group cohesion (EA). Surprised by the smooth and rich harvest, the frontrunners next use their brokering (EA) power to invite employees from diverse units for the 'extra afternoon' at Science Day. The co-design researchers use the harvest to prepare generative tools energising (EA) participants in a lively explorative discussion while synthesising insights and questions into a briefing for the bootcamp students.

Sensing Phase 1.0: Varying Approaches to Cooperation

In this early phase, tensions revolved around varying approaches to the cooperation generated by potential order responses of accountability and efficiency (Figure 4, 1.0-A-T1). The sensing phase was used to elicit relevant themes and developments in the organisation's environment (e.g., weak signals of change) to develop input for the bootcamp enabling them to stretch towards alternative futures. Vignette 1 shows how both frontrunners and co-design researchers each have their assumptions and expectations regarding the evolving process. In this phase, assumptions concerned the various roles and responsibilities of the frontrunners, participating students and employees. The group – frontrunners and co-design researchers – was still forming and trying to envision how the probing process would evolve.

The frontrunners and co-design researchers sought to reconcile a client-contractor relationship with an equal co-design partnership. We saw the co-design researchers taking the lead in designing the journey based on their past experiences and answering to their role as contractors, even though formal contracts had not yet been signed. Feeling responsible for leveraging the energy among initiators and co-design researchers, they did not notice their leading action inhibited the agreed and expected role of the frontrunners in the co-design process.

The togetherness of the core team in this phase was high which allowed them to generate enabling activities, like sponsoring, anticipating and brokering. These enabled the core team to play with the tensions that the novelty of the probing practice raised as shown in Vignette 1, rather than eliminate them.

Stretching Phase: Varying Trust in the Approach

The evaluation session revealed that entanglements between issues of timing, tempo, and uncertainty in relation to diverse future perceptions fuelled tensions around varying trust in the approach (Figure 4, 1.0-B-T2). The stretching phase during the bootcamp was very energetic generating much interaction and flow of information between students and participating employees. Yet it was also troublesome for both students and employees. Practising alternative future probing elicited uncertainty about how far to stretch into the future, what might be a good probe to trigger a relevant discussion, and what would be considered a relevant discussion. None of the participants felt comfortable about this. The students wanted to do the right thing for DigiOrg whom they considered their client. Participating employees were struggling to find the right attitude towards the students as sparring partners rather than clients who knew what had to be 'delivered'.

In their curriculum, the students were used to having a client-contractor relationship, working towards a solution for the client's problem. This training hindered several students from grasping the purpose of probing - i.e., inquiry of possible new values disclosed by future probes instead of focusing on the implementation and feasibility of a future probe. By searching for 'solutions' for DigiOrg in the future, the students treated their alternative future imaginations in a future-perfect way, as desirable futures to plan for or undesirable futures to plan away from, instead of their intended use as triggers of imagination and learning about alternative present actions. In doing so, they may have triggered similar behaviour among employees, unintentionally eroding trust in the approach.

While during the bootcamp energy and performance speed were too high to hit the brake, we noticed unattended signals that the student process as supported by the co-design researchers and the process as experienced by the employees was not aligned. For instance, a swift reflective conversation between the initiating frontrunner and co-design researcher addressed the thin interaction between students and employees resulting from last-minute adjustments to the programme that disengaged employees. We also saw how, despite repeated calls by the co-design researchers to trust the unfolding process and to use the generative tools, students and frontrunners both struggled with the difficulty of imagining genuinely alternative futures. A student reported: "We encountered troubles in generating feasible ideas. Most of the time we were pulled back for generating ideas about the future they considered unrealistic" (student#19). Thinking in terms of feasibility challenged stretching imagination towards genuinely alternative futures.

During the bootcamp, the students were positioned as attractors (enabling response) within the organisation, creating a sense of excitement and interest on the work floor, which encouraged employees to get involved. The students challenged the employees to step outside their comfort zone, prompting an order response of reverting to the structured, familiar approach of coaching students. One of the frontrunners recalled during the evaluation: "*I had expected them to be a little more curious about what it is we are doing here! That [curiosity] was completely absent*" (evaluation P1.0). Consequentially, the participating employees focused on coaching the students in their assignments rather than relating their future-making practices to the organisation's daily practices. This did not improve trust in the approach but it did not seem to detract from it either.

Zooming in on the evaluation session uncovered how concerns about timing and tempo, related to rebalancing the involvement of employees and students, actually

related to tensions around trusting the approach. First, timing and tempo issues had put a strain on the explorative cooperation between students and employees causing one frontrunner to propose strict planning and project management (order responses). He reflected on how appointed milestones postponed to support the students' learning process were consequential for the cooperation with employees' trust to step out of their comfort zone. He pleaded:

"We are an agenda-driven organisation. It is impossible to match the improvised way of working with the students. I'm afraid we need strict project management planning fixed interaction moments... The question then is how do we pull people out of their comfort zone? We don't want to overregulate the process. We need your [co-design researchers] expertise on how on earth to do that?" (evaluation P1.0).

Second, our analysis brought to light how timing and tempo issues were entangled with the frontrunners' feelings of uncertainty related to different perceptions of the future. After the bootcamp, we witnessed them pulling alternative future explorations to more conventional futures for the next probing iteration. They argued, for instance, that developments in the digital domain they operated in went so fast, that there was no need to look further into the future to explore disruptive digital technology. They feared future probes would be too far off what employees were working on, failing to engage them. While this was a valid argument, it also disclosed an underlying lack of trust in the approach as further illustrated in Vignette 2.

Togetherness was low at this point and the co-design researchers got the impression that continuation was at stake when Evan distanced himself from taking the financial decision. Shortly after the evaluation, an enabling response would lead to iteration 2.0 as explained after Vignette 2.

Interpreting Phase 1.0: Timing and Tempo Differences

After the bootcamp, timing and tempo for engagement in the probing practice between frontrunners and co-design researchers and students drifted apart (Figure 4, 1.0-C-T3), despite planned time for contemplation and incubation to interpret the significance of the boot camp's outcomes for DigiOrg. Interestingly, the energetic effect of the bootcamp seemed to have suppressed the recognition that the bootcamp was only the beginning of a long-term cooperation with alternating moments of acceleration, contemplation and incubation. The bootcamp was a typical an acceleration moment. After the bootcamp, the frontrunners felt a little

disappointed with the outcome, but without spending time on contemplation, let alone incubation. From their viewpoint, this was a logical emotional response after having struggled with double uncertainty about future worldviews as well as what kind of probes would be appropriate to represent and experience such worldviews. Seeing the whole 'experiment' as a probe, enabled them to appreciate the cooperative efforts, but at the same time insisted on removing one of the uncertainties next time - either have clarity on future worldviews, which they referred to as scenarios, or probe existing mature technology (see also Vignette 2).

Meanwhile, the co-design researchers revived their idea of adding a Probe lab of several weeks to delve deeper into one of the themes emerging from the Bootcamp as a student team was ready to capture this opportunity. While for the co-design researchers, it had been clear from the start that swift action would be needed at this point, such was not on the radar of DigiOrgs frontrunners. A bit surprised about the timing, the frontrunners geared up and linked resources to continue in the probe lab to not let down the students. Increased time pressure, however, resulted in the minimal effort one frontrunner and one co-design researcher put into interpreting the boot camp's outcomes and preparing a student briefing. Rather than facilitating an interpretation session the frontrunners and co-design researchers then had an evaluation session. Feeling overwhelmed and not yet ready, the frontrunners firmly pulled the brake during this session (see Vignette 2) but also continued to participate in the probe lab, be it with minimal effort (see next section).

Deepening Phase 1.0: Organising Exploration Next to Normal work

During the probe lab in the deepening phase, tensions revolved around organising exploration next to regular work (Figure 4, 1.0-D-T4). The probe lab was set up to take a longer period of time to delve deeper into interesting themes and insights from stretching during the bootcamp. The probe lab came too soon for DigiOrg resulting in few resources being mobilised to participate. Most participating employees got caught up in regular meetings and agendas. Enthusiasm among frontrunners to bridge the idea of the probe lab to others was lacking. Strikingly, the probe lab was situated in the educational building, far from DigiOrg, while the bootcamp had taken place in company to create buzz on the work floor. A lack of commitment and support from DigiOrg turned this probe lab into a student project living a life on its own. Attention was directed at finishing the student project rather than considering its implications for DigiOrg, as time moved towards the summer holidays and the focus was shifted towards a second iteration starting after the summer.

Vignette 2 is illustrative of T2 and T3, their underlying Order Responses (OR) to the practice of probing futures and faltering Enabling Activities (EA) during the evaluation of probing journey 1.0 as indicated in parentheses. We explain these interpretations below the vignette.

Vignette 2 - Embracing complexity while seeking clarity

To evaluate the probing 1.0 journey, the main organisers, John and Evan from DigiOrg and Roy and Karen from co-design, have a generative session to look back and generate ideas for improvement. The co-design researchers have prepared a visual timeline of events, commencing with Science Thursday preparations involving employees, leading to a four-day Bootcamp with students cooperating with case owners and employees, culminating in another Science Thursday event at the end of the Bootcamp. A Probe lab with students elaborating on initial insights from the Bootcamp is still running as the evaluation session takes place. The timeline supports their reminiscence of the past process and captures the obstacles and enablers they will identify during the session. After a walk-through led by Karen, Roy invites all participants to individually annotate the timeline using differently coloured sticky notes, distinguishing between enablers, obstacles, and other remarks. Next, these annotations serve as the foundation for a deep discussion, fostering an understanding of the mechanisms at play in the probing practice. The insights derived from this discussion are to fuel ideas for improving future iterations. Two intertwined themes emerge from this discourse: the disparity between the adaptable timing and tempo of the students' process versus the rigid, agenda-driven participation of employees during the Bootcamp (T3), and the consequential pressure on adopting an exploratory mindset. This second theme revolves around the relationship between uncertainty and diverse perceptions of the future and the resulting pressure on trust in the approach (T2).

Amidst this discussion, John reflects on the challenges posed by the initial 'future flashes' used to guide the students and part-time participating employees during the Bootcamp. He highlights the difficulties encountered in comprehending and engaging with, what he calls, the scenarios, an issue that, he feels, persisted throughout the week. This reflection prompts John to suggest a more refined formulation of scenarios that will prompt the exploration of "genuinely useful futures for the organisation [...] still [be] very broad and very future-oriented and very very innovative in a way" (OR). Roy subtly contextualised this observation as part of a larger process (EA) referencing the preparatory journey, emphasising the importance of Science Day with employees and translating outcomes into 'what-if-like questions.' The need for more effort in this regard was underscored.

While John hints on less disruptive scenarios which would need more profound prep time, Evan proposes a different approach. He suggests streamlining scenario crafting

by converging earlier on concrete elements (OR) relevant to the organisation. Evan overtly doubts the effectiveness of the undertaken process (T2), which emphasised broad exploration of the plurality of macro and meso-level signals of change during Science Day.

This proposition by Evan elicits strong reactions from the co-design researchers, who fear it will limit the scope of potential futures to be explored to linear near futures. Before actually responding though, Roy intervenes (EA), offering the group an opportunity to either delve into this issue extensively, possibly at the expense of other important matters or defer it for further discussion. Evan clarifies his intention behind raising the issue, asserting that it is a conscious choice to spark dialogue about the approach (EA).

As the conversation unfolds, it centres on the implications of uncertainty in exploring future scenarios. Evan expresses his apprehension about the potential loss of employee commitment when dealing with what he refers to as "double uncertainty" surrounding both scenarios and probes. Expressing concerns about the cumulative negative impact of uncertainty, he suggests reducing uncertainty (OR) by either starting from probable scenarios based on known knowledge and developing unexpected probes or starting from high-uncertainty scenarios and basing probes on common technology. He adds: "I am not saying that it [the approach] ought to be this way, but I am just expressing how I have experienced the week, and I thought like...that is two times a minus which does not add up to a plus but to more minus...". Roy seizes this moment to again propose a more profound engagement of employees in a pre-bootcamp project to better prepare cases, albeit leaving the definition of 'better' open-ended (EA). Evan concurs, expecting increased ownership with this approach. Roy further contextualises the Bootcamp within the larger journey, including Science Days and Probe labs, and while empathising with Evan, subtly undermines his conclusion. "I agree that we must be very focused in that uncertainty, but... Because the confusion is too much. I have previous experience with such confusion on top of confusion and then students just dropped out, and I did not see that happening here though." The remark only triggers some jokes about a student who had not shown up at all, leaving unaddressed whether Roy intendedly left open the option of working with more uncertainty than Evan thought useful (EA).

Although the conversation heads on to other topics, the tension between embracing uncertainty and seeking clarity keeps popping up as Roy sensitively probes (EA) the group to further explore the possibilities of stretching the scope of possible futures. His provocations do not invigorate similar heated discussions, yet his proposals (e.g., involving clients of the organisation or relocating employees outside their working space) are contested and skilfully declined. At the same time, Evan stresses the importance of organising ways to engage employees that will "knock their socks off".

Vignette 2 shows how the group grappled with the intricate interplay of timing and tempo (T3), and uncertainty about shaping future perceptions (T2). The frontrunners emphasised the need for more control over the future 'scenarios' and pulled back future explorations to the probable near future domain. We interpret both as order responses, that might resolve the tensions around the trust in the approach (T2) to attract more employees but would also alter the approach into exploring more predictable near futures. Evan's response discloses that he understands the consequences of his proposal – "I am not saying that it ought to be this way" (evaluation P1.0). Perhaps, he was even inviting the co-design researchers to convince him otherwise from a methodological perspective as he had repeatedly asked for more academic input on the co-designerly approach during the journey.

The subtle enabling activities of co-design researcher Roy to open up the mindsets for further stretching into the future were perhaps too subtle to realign around the original purpose of engaging in the probing practice. In retrospect, it appears as if the purpose had shifted towards getting more employees involved, at the expense of engaging with truly different alternative futures, or in their language, 'wild ideas about the future.' The ongoing tension between embracing uncertainty and seeking clarity underscores the complexity of their endeavour.

Surprisingly, the frontrunners responded in an enabling way rather than giving in to the pull to order as indicated by the request for more control and concreteness. They adjusted the container in which the explorative journey took place by framing it as part of the organisation's GreenFields programme (pseudonym). While still a bottom-up approach it was now placed within existing organisational boundaries where such exploration could legitimately take place. This mobilised the programme's manager to leverage his position of encouraging constructive dissent of business as usual and stimulating exploring unprecedented possible futures. His sponsorship, both financially and supportively, was an enabling response ratifying the second iteration's go. The manager contracted the co-design researchers for a new probing bootcamp with students surrounded by two co-design sessions with employees and the intention, after a formal go, to continue with one or more Probe labs and further Co-design sessions.

2.4.2 Probing Iteration 2.0

Containing the Probing 2.0 journey within the GreenFields programme supported by its manager led to the expansion of the core team with 3 new volunteers from DigiOrg. The GreenFields programme had stature within the organisation, but few pay-rolled employees. Executing the programme relied on the voluntary

participation of line employees while being accountable to their line manager. Nevertheless, during the second iteration's kick off the renewed core team of six frontrunners from DigiOrg and three co-design researchers agreed to take equal responsibility for successfully developing, organising and leading the interventions during the probing 2.0 journey. As the new volunteers had different reasons for stepping forward – e.g., the interesting topic or the novel co-designerly approach – , special attention was drawn to aligning the group members and taking ownership. To do so, the co-design researchers introduced a common generative technique for effective meetings – i.e., IDOARRT (Hyper Island, n.d.) – that enabled participants to align around 'intentions', 'desired outcome', 'agenda', 'roles and rules', and 'time'. Discussing and deciding these elements (re)established a baseline sense of togetherness from which our data show that tensions again increase and togetherness drops.

Sensing Phase 2.0: Varying Approaches to Cooperation

Despite implementing enabling activities and tools aiming to increase a sense of shared ownership of designing, leading and enacting the second probing iteration, tensions in cooperating with a partially new group of frontrunners revolved around varying approaches to the cooperation (Figure 5, 2.0-A-T1). The co-design researchers provided generative tools to cooperatively co-create the probing journey giving space to all team members to take the lead and give direction. They also used the IDOARRT technique at the start of each regular core team meeting until the bootcamp. While these generative tools worked as enabling devices to create group cohesion there was an underlying persistent pull to order. Where the co-design researchers were thinking about how to adapt the probing practices to gear it towards the learning (from possible futures) needs of different types of employees the group had identified, the frontrunners kept trying to 'sell' the probing approach to them. We interpret the latter as an order response because their focus was on planned engagement and campaign-like extrinsic motivators rather than using their networks to create the buzz that might invoke spontaneous engagement.

After two attempts to cooperatively design a plannable probing journey, the co-design researchers intervened by proposing the idea of thematic embassies with designated lead ambassadors. This proposal aimed to generate content and facilitate meet-ups, which would draw other employees to these thematic embassies. The embassies would be responsible for providing the students with sufficient briefings and bringing them up to speed with knowledge and questions revolving around the chosen themes. During the meeting, this shift in focus from

process to content had an activating impact on the newcomers in the core team who started to generate a list of interesting themes. As such, the proposal served as an enabling factor, but it later raised order responses related to organising exploration next to regular work. It was labour-intensive and perceived as 'extra' rather than part of daily practice. Accountability towards hierarchical management became an issue.

To elucidate, the effectiveness of lead ambassadors and thematic embassies in their enabling capacity hinges on the allocation of time for the development of engaging content. Some frontrunners reluctantly assumed lead ambassador roles when no other employees volunteered during the co-design session that further explored the embassy themes. Subsequently, in a consecutive core team meeting, these frontrunners expressed apprehensions about regular work commitments preventing them from performing the task, which relates to an accountability issue. This order response grew even stronger when other frontrunners anticipated a potential lack of sustained commitment from participants during the co-design session resulting from a misalignment between the activities and themes during the session and the participants' daily professional practices. This increased the pressure on the newly appointed lead ambassadors to create compelling content to attract more employees to participate in the thematic embassies. Succeeding in forming a thriving embassy would ease their task though.

In the month until the bootcamp, the ambassadors were in the lead in establishing the embassies and developing the themes, while the co-design researchers continued to support the process by tapping into the progression during a core team meeting, organising another co-design session to bring the embassies together to write briefings for the bootcamp and providing generative tools – e.g., briefing templates. The meetings disclosed that progression was slow. Just before the bootcamp, the ambassadors had brokered enough to form small embassies that cooperated in finalising the briefings and would cooperate with the students during the week.

Stretching Phase 2.0: Varying Trust in the Approach

The second bootcamp created even more energy and enthusiasm during the week, yet our analysis revealed tensions similar to the first time (Figure 5, 2.0-B-T2). Despite measures, the involvement of employees remained a concern and trust in the approach was undermined by risk-avoiding and results-oriented behaviour of participating employees. Measurements to lower the threshold for participation were threefold. First, there was the establishment of the embassies to use informal

networks for attracting colleagues. Second, meetups between employees and students were strictly planned in advance and at the edges of work days to lessen interference with daily schedules. Third, a central spot near the main coffee corner was allocated to 'bridging students' who would continuously interact with employees based on updated work during the bootcamp. Noticing that it still was a point of care for the co-design researchers, one employee joked to "dismantle all coffee machines but this one, then they all come here" (co-researchlog). The frontrunners expressed their satisfaction during the bootcamp, but afterwards, they judged the involvement of employees still insufficient. Having experienced how difficult it was to involve employees in the thematic embassies before the bootcamp, they felt a bit disappointed in their colleagues, yet also understood their demanding agendas.

The co-design researchers discussed amongst themselves how employees often pulled back the students during their interactions avoiding the risk of students wandering too far into the future. "The employees feedback to the students on how they engage with the future and their ideals, but have no idea how they are torpedoing the students' ideas. Consequently, the students regard them as the experts and follow their leads" (researchlog). This stood in sharp contrast with the co-design researchers' attempts to help them deliver surprising and provocative future imaginations.

The evaluation meeting of the core team right after the bootcamp highlighted again a feeling of 'mission accomplished' among the frontrunners. They expressed that relevant outcomes for daily practice were still lacking, although the outcomes were yet to be interpreted in a follow-up co-design session. A re-discussion of the appropriateness of the probing approach to the organisation oscillated between discovering substantive learning outcomes beneficial to their product portfolio, which reveals a results orientation (OR), and challenging the status quo by confronting and disrupting content, which aims to enable emergence (EA). The frontrunners also contemplated whether the applied bottom-up approach was sufficient to expand an explorative alternative futures-oriented mindset through the organisation or whether more top-down managerial involvement was needed to create beneficial circumstances regarding time and flexibility. The conversation went back and forth between doubting and embracing the probing approach indicating wavering levels of trust.

At the end of the meeting, the frontrunners concurred that the second iteration had disclosed the difficulty of getting employees involved despite the ambassadors'

efforts but also that they had no idea what it had brought the participating employees in terms of content. They asked the co-design researchers to gather insight by interviewing embassy members. The team further agreed to continue with a co-design session to interpret and gain insights from the student work. From there the core team would determine how to proceed, awaiting a formal go.

Interpreting Phase 2.0: Timing and Tempo Differences

In this phase, timing and tempo differences started to impact the continuation of the journey triggered by order responses that pulled frontrunners back to their operational tasks (Figure 5, 2.0-C-T3). The co-design researchers pushed to engage with the student work to extract the 'hidden gems' they had noticed during the bootcamp and to connect such to ongoing practices in the organisation in an attempt to link up others (EA). Yet, the frontrunners never put in the effort to make sense of the insights and implications of the student work. They seemed to hide behind operational commitments (OR) to avoid that effort, although eventually during a co-design session, playing with the content gave a positive boost to group cohesion, but with fewer participants.

The waning togetherness began during a meeting of the core team just before the Christmas break to discuss options for the follow-up and make plans for interpreting the results of the bootcamp (see Vignette 3). The meeting resulted in a prudent 'go' that encouraged the co-design researchers to start planning meetings and organise the continuation. The frontrunners had stressed the importance of interviewing the embassy members as soon as possible. The co-design researchers tried to grant the request, but the Christmas holidays made conducting the interviews challenging.

Most ambassadors returned to their operational tasks emanating that their job was done. In the new year, the co-design researchers, well aware that the process was not yet completed, tried to mobilise the ambassadors to process the outcomes of the bootcamp. Yet, the energy was lost and on both sides were signs of fatigue and even illness, causing dropouts. The sense of togetherness was lost leaving its marks on attendance of meetings and commitment. The interview analysis was delayed due to illness and the co-design researchers' process started to deviate from the envisioned process. This presumably affected the frontrunners' process next to operational demands.

The meeting to prepare the agreed co-design session was poorly attended by both sides. Most ambassadors had declined due to other obligations. The co-design session itself revived group cohesion as playing with the content generated

renewed energy amongst participants. Nevertheless, one of the ambassadors, who had been questioning the method-goal fit regularly, had informed the core team to refrain from further involvement. He could no longer justify his exploratory activities against his operational deployments. On the contrary, another ambassador who found justification in his research activities sought to align follow-up with his research themes.

Deepening Phase 2.0: Organising Exploration Next to Normal Work

In the deepening phase, a decline in togetherness was palpable but not explicitly addressed, and surfaced as tensions of organising exploration next to normal work (Figure 5, 2.0-D-T4). The co-design researchers took the lead role, which they assumed to be assigned, to initiate the collaborative process. A probe lab with students was established to profoundly probe some of the insights derived from the bootcamp. A graduation student was hired to synthesise findings and link them to DigiOrg's daily practices. On DigiOrg's side, the ambassador who managed to align these activities with a research task attempted to bridge to relevant resources within the organisation.

Another core team meeting was planned to give form to the continuing process focusing on other events to create buzz among employees. The vibe was constructive, even hopeful and provided many concrete ideas to bring the process closer to existing events of DigiOrg to create more embeddedness. After this meeting and rather unexpected for the co-design researchers, DigiOrg ended the cooperation, although they made minimal arrangements to finalise the probe lab with students that had already started.

Vignette 3 illustrates how T2 and T3 surface tacitly during the meeting, and how these tensions remain unspoken suppressed by faltering enabling activities aimed at mitigating order responses. After the vignette, we explain why we interpret this as a turning point in the cooperative practice of probing futures that marks declining togetherness and lack of containment.

Vignette 3 draws attention to what is not explicitly said but is present in the room, that the frontrunners have doubts about the approach (T2) and the pace at which it is happening (T3). The doubt was felt by Roy and Simone, but not articulated at the time. The relational dynamics in the group took the form of 'us versus them' or 'client versus contractor' (T1) rather than the cooperative togetherness felt before. This was unintendedly reinforced when Karen started presenting the co-design researchers' suggestion for the continuation. Even though she was invited to do

Vignette 3 - Declining togetherness and lack of containment

A strange vibe hovers over the meeting just before the Christmas holidays. It was called to discuss possibilities for continuation. Some frontrunners are absent. The co-design researchers (Roy, Karen and Simone), eager to continue, had put their ideas on slides. They intended to energise (EA) the frontrunners with exemplary substantive insights from the probing bootcamp and how these could be elaborated in a series of probe labs to bring them closer to DigiOrg's daily practices. Unfortunately, Karen is substantially delayed while carrying the slides. She swiftly sends them to Roy and Simone, but despite efforts, they are not able to open the digital slides to start the meeting as planned.

Instead, the frontrunners reluctantly question how relevant the outcomes of the bootcamp are to DigiOrg's current business, and how novel the developed ideas and future probes actually are (T2). There is a tense atmosphere in the room. A rather abstract conversation unfolds about how to reinject innovation into the organisation culminating in the question "Does our organisation feel enough urgency to pursue real [more radical] exploration?".

Amongst the co-design researchers, Simone later reflects on this part: "No one described how future probing can play a role in it. It was as if the ongoing process we are in had nothing to do with that. As if after the bootcamp, they think this was it! But we are just in the middle of a series of events." (T3). As a junior researcher, she had not felt confident to share this impression during the meeting.

Then Karen arrives, not aware of the preceding conversation nor what is alive in the room. Getting a cup of coffee, she is covertly informed about some unclear tension in the room but also urged to proceed as time is running short (OR). She presents the slides with initial themes and ideas for the continuation without sensing ambient tension. She stresses the jointness of their efforts by indicating the empty spots in the slides that mark the cooperative work that the team would need to do in the follow-up of the bootcamp. Karen affirms that the co-design researchers are conducting the agreed interviews with embassy members by telephone to circumvent planning issues in sight of the Christmas holidays. She also points out that interpreting the outcomes of both the interviews and the probing bootcamp would require cooperative work of the core team and preferably in an additional co-design session with more employees (EA).

After some clarifying questions and stressing the importance of the interviews with embassy members, a prudent 'go' is granted for the continuation while some frontrunners rush towards their next meetings.

so, her acceptance to proceed as planned ignored consultation of the systemic dynamics present in the group to let the system do the work. On the contrary, it may have muted the voices that had raised doubts about the approach. Hence, her intervention along content-lines was a faltering enabling activity.

Over time, the relational dynamics in the group were further neglected, despite cumulating signals of misalignment. On both sides, people (temporarily) dropped out and the remaining frontrunners refrained from the task of interpreting the bootcamp outcomes for reasons of accountability to their operational management. We do not want to discount that the frontrunners felt pulled to order by the organisation, but we argue that the uncertainty and difficulty surrounding the task also contributed to giving in to this pull to order. We were drawn to this interpretation by the persistent avoidance (OR) of most frontrunners to engage with probing insights to challenge existing patterns so that new orderings can take shape. According to Wierdsma (2012) this requires entering 'de plek der moeite', which translates into 'the place of effort', where reflecting on interaction patterns and underlying principles enables individual and collective learning. As the purpose of probing alternative futures is to explore such new orderings and challenge existing ones, probing is meaningless without entering this 'place of effort'. Future probes may have triggered an initial discussion during the exposition, but further inquiry of what the probes disclosed about new emergent value orders was lacking. As these challenge existing principles, practices and world views that have constituted organisational practice for so long, it may come with feelings of discomfort and psychological anxiety. We believe this contributed to (unintentional) avoidance of engagement (OR).

To elaborate, the evolving journey after the bootcamp was, as before, supported by the co-design researchers through generative tools attempting to cooperatively process the outcomes (EA). Relational dynamics, however tacitly, indicated risk-avoiding behaviour disguised as accountability issues to prevent the frontrunners from participating (OR). For instance, while some ambassadors repeatedly gave priority to other operational obligations, others attended but felt no drive nor sufficient expertise (OR) to re-interpret the student's insights from the bootcamp and relate them to DigiOrg's practices. This behaviour further indicates misalignment in the cooperative future-making practices, which was not contained.

A short revival of the level of togetherness occurred during the last co-design session when particularly one of the ambassadors drew the others with him into the 'place of effort', based on personal curiosity and professional background (EA).

This spurred progress in the substantive process giving rise to a formal 'go' to the continuation and initiating probe labs. Shortly after, the start of the student teams in the probe labs again raised doubts about the approach. This time, it was about student involvement. This was striking as the journey started with the explicit desire to involve students for their fresh perspectives. We consider this a further signal in the accumulating decline of togetherness that containment was at stake. At the time of the bootcamp, the boldness and maybe naive creativity of the students towards alternative futures had offered a safe space to freely engage with truly alternative futures without consequences (EA). Now the frontrunners recognised that this voluntary character of participating had also refrained employees from engaging with the implications for their daily practices, acknowledging that participation had been "too voluntary and too open-ended" (interview#4).

In a subsequent core team meeting, the team tried to tackle such insights with constructive ideas to redesign the continuing journey closer to organisational practices that already existed for exploration. Yet, such ideas did not build on further engaging with the outcomes of the bootcamp. The frontrunners seemed to strictly relate that part to the students continuing in the probe labs and a co-design researchers' 'thing' not part of their explorative journey. The frontrunners participated in the initiated probe lab with students and were in the lead for listing opportunities to integrate alternative future explorations and existing organisational practices. Awaiting this move, the frontrunners discontinued their cooperation with the co-design researchers.

2.5 Theorising from Findings - Managing Containment

In this section, we describe how we theorised from our findings to develop a process model for managing containment while probing futures. The concept of containment, borrowed from the literature on complex system dynamics and leadership (Eoyang, 2007; Ladkin, 2013) helps us to unpack the four tensions we identified in our findings as entanglements of organisational *order responses* to future probing practices and *enabling activities* to mitigate such order responses and progress the probing practice. We conclude this section by presenting our process model of managing containment.

2.5.1 Containment Tensions, Order Responses and Enabling Activities

Relational dynamics in our case were reflected in the fluctuating levels of togetherness (line graph in Figure 4-5) among participants due to feelings of uncertainty and not knowing invoked by probing futures. The fluctuations matched with four tensions we observed across stages in the practice of probing futures. While particular tensions dominated specific stages, we saw an overall accumulation of tensions leading to the final breakdown. Fluctuations can be explained by alternating order responses that impeded the practice of probing futures and enabling activities that managed containment. Managing containment entails withstanding order responses and containing discomfort on an emotional level due to uncertainty invoked during the practice of probing futures.

Our research uncovered four key tensions: different cooperation approaches (T1), varying trust levels in these approaches (T2), differences in timing and tempo (T3), and integrating exploration time alongside regular work (T4). These tensions emerged throughout the stages of our probing process: sensing the present (A), stretching imagination (B), interpreting implications (C), and deepening themes (D). Engaging in imaginative work, as in probing futures with established organisations, necessitated managing discomfort and psychological anxiety to persevere through challenges. While we didn't directly measure these feelings, there were clear signs of discomfort. Firstly, frontrunners tended to gravitate towards nearer, more probable futures, indicating discomfort with constantly pushing the boundaries of perception. Secondly, employing the novel practice of probing futures created tension within hierarchical organisational structures, acting both as a disruptor and a cohesive force (cf. Eoyang, 2001). This ambiguity led to feelings of 'double uncertainty,' as expressed by one frontrunner during the evaluation (Vignette 2). Thirdly, the withdrawal of some frontrunners from probing interpretation efforts suggested an avoidance of stress associated with relating probing insights to imagining alternative courses of action. These observations suggest that the failure to manage discomfort contributed to the emergence of the identified tensions, highlighting the importance of containment.

In both rounds of future probing, tensions emerged across phases, each highlighting different issues (T1-4 in Figure 4-5). Before the bootcamps (A), tensions mainly focused on 'varying approaches to cooperation' (T1). While tensions were overlooked during the bootcamps (B), they resurfaced immediately afterwards, with 'varying trust in the approach' (T2) becoming prominent. Subsequent phases (C, D) saw tensions surrounding 'timing and tempo differences' (T3) and 'organising

exploration next to normal work' (T4). Initially manageable, tensions in the first iteration spurred a second with renewed energy. However, by the end of the second iteration, tensions had escalated to an uncontrollable extent, leading to the cooperation's termination.

In analysing tense situations during probing phases, we found responses hindering the probing activities, such as valuing accountability, seeking structure and control, avoiding risk, or focusing on solutions. These responses, termed organisational order responses, typically emerge when the status quo is challenged, prompting organisational forces to strive for stability through structured processes, risk mitigation, and control mechanisms (Uhl-Bien & Arena, 2017). At DigiOrg, unfamiliarity with future probing practices and alternative future imaginations triggered such order responses. For example, embassy members felt energised and intrigued by bootcamp discussions but reported missing the support from management to engage further, except in their spare time. Our findings illustrate how order responses manifested as the aforementioned tensions, hindering future probing. We also identified enabling activities that address these tensions. Enabling activities, adaptive in nature, aim to engage the system's edges, bend rules, and navigate social networks to foster energy and change flow (Uhl-Bien & Arena, 2018). Examples in our case include brokering, sponsoring, fostering group cohesion, using tags and attractors, and bridging and linking social networks, all of which facilitated the sustained practice of probing futures (Figure 4-5).

In probing futures, enabling activities were crucial to manage actors' anxiety and discomfort while exploring alternative futures. These activities helped resist the urge to stick to familiar ideas – an order response – and encouraged staying open to troubling uncertainty involved in practising future probing. Our observations during a bootcamp showed how discussing potential futures sparked lively debates, but employees later dismissed them as irrelevant to their daily work in which they pursue more foreseeable futures. This tendency to focus on near-futures during future probing limited the exploration of unprecedented possibilities, hindering the agency of imaginative alternative futures. Our findings underscore the need for unrestrained imagination in probing possible futures, as early constraints can stifle creativity and perpetuate existing norms. We noted the tension between appreciating students' uninhibited imagination and expecting them to adhere closely to predefined parameters set by the frontrunner in their briefings. The students' imaginative work was designated as 'irrelevant' and 'not novel enough' at the same time. This duality highlights the struggle of desiring to stretch towards surprising alternative futures and simultaneously tackling such unsettling ideas

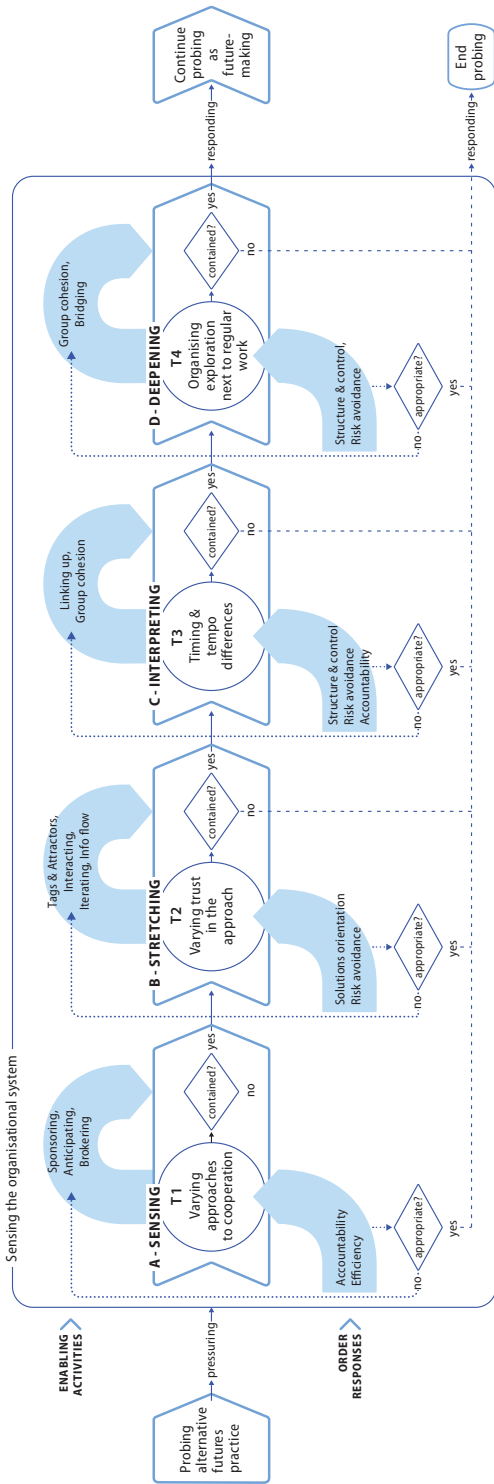


Figure 6 – Model: Managing containment during the practice of probing futures

with structure and existing knowledge. To address this, we advocate for managing containment – employing enabling activities to withstand order responses and endure emotional discomfort. We propose a process model to navigate these tensions and support imaginative exploration effectively (Figure 6).

This model emphasises ongoing reflection to balance order responses with enabling activities in the ongoing practice of probing alternative futures. Order responses signal that the organisational system is pressured, which creates potential opportunities for emergence (Lichtenstein, 2014), which is the purpose of probing alternative futures. Enabling activities facilitate energy flow, enabling actors to endure and engage with futures that jolt the status quo. Opportunity tension is created by the significant difference between the practising probing futures, with its unsettling future probes, and common organisational practices. Containment tensions, on the other hand, indicate resistance to change and are countered by enabling activities. A lack of containment, for instance through faltering enabling activities or too strong order responses, will dampen the flow of energy and end the probing practice as eventually happened in our case. When containment tensions arise, it's crucial to reassess underlying order responses. Should a complex challenge evolve into a structured challenge, a different approach is needed (Bushe & Lewis, 2023; Kurtz & Snowden, 2003). For example, when a group defines a problem, solution, and plan, probing alternatives becomes less relevant, although its relevance may re-emerge when closure on a plan is reached prematurely.

2.5.2 Containment in the Sensing Phase

In both phases of sensing the present before the bootcamps tensions revolved mainly around 'varying approaches to cooperation' (T1). The sensing phase (A) focused on detecting interesting weak signals of change in society that could be concretised through future probes, but it was also the phase where actors sensed each other's intentions and purpose with practising probing futures. T1 entails the tension between a client-contractor approach and equal partnership in a co-design approach. The first triggers other relationships than the latter and comes with different expectations about who is responsible for what. Reconciling this proved difficult as we saw when the co-design researchers' leadership (1.0-A) inhibited a more prominent role for the frontrunners in the co-design process.

In probing 1.0 there were some concerns about the approach that might signal order responses, but we foremost saw many enabling activities that contained the core team to proceed. For instance, expressing assumptions openly offered an opportunity to leverage actors' anticipative practical knowledge and address

concerns. When Karen tried to persuade Evan to conduct the harvest of relevant drivers and trend signals by explaining the tools, she did not touch upon the underlying concerns about the approach and therefore was ineffective. As Evan opened up the way he did (Vignette 1), he was sponsoring the approach and anticipating order responses from employees. These enabling activities offered the co-design researchers the opportunity to leverage his practical knowledge about his colleagues, which even led to a positive experience with sticky notes for Evan.

In probing 2.0 these experiences were further translated into enabling activities as the co-design researchers used generative tools to support the frontrunners in co-designing the second probing journey. Yet, their enabling approach started to falter as progress was slow and put pressure on the timing of the bootcamp. A new enabling activity, proposing the role of lead ambassadors, was an attempt to support the frontrunners to lead their process, but it was reluctantly received fearing too much work that they were not accountable for. We interpret this as a typical order response reflecting frontrunners pulling back to their operational tasks rather than embracing the novel probing approach. Togetherness dropped in this phase. Online enabling activities by Karen appreciatively expressing her concerns went unnoticed as the process unfolded towards the bootcamp. Another signal of containment issues.

2.5.3 Containment in the Stretching Phase

Tensions during the bootcamps were more or less neglected, which was possible because the students created so much energy that containment revolved around them (tags) and the future probes (attractors). Enabling activities further involved the interaction and information flow between students and participating employees. When this energy dampened after this phase of stretching to alternative futures (B), tensions surfaced as 'varying trust in the approach' (T2). Trust issues are usually good indicators of lack of containment questioning whether everybody is still 'on board'. The tensions started to develop during the stretching phase (1.0-B-T2) as different perceptions of the future collided. Where the students, stimulated by the co-design researchers, pushed the frontrunners' boundaries of stretching towards alternative non-linear futures, they pushed back pulling to conventional linear futures. In terms of order responses, we interpret this as risk avoidance and solution orientation. Rather than embracing the method to explore unprecedented futures, they pulled back towards more knowable and feasible futures, avoiding the risk of not knowing. The first evaluation session (1.0-B; Vignette 2) showed this was non-negotiable to the frontrunners, but the same applied to the co-design researchers' perspective (T2). Where Roy kept trying to find openings for further

future stretching, Evan more firmly defended his viewpoint. Probably, the client-contractor relationship prevented the co-design researchers from escalating this issue as the co-design researchers feared a termination of the cooperation. In retrospect though, not fully containing these issues may have caused the repetitive course of the second journey. In the second iteration, the bootcamp evolved similarly (2.0-B), as the students were still stimulated to stretch towards alternative futures, unknowingly feeding the tension (T2). While the distrust was directed towards the probing approach, it impacted the relational dynamics between frontrunners and co-design researchers after the bootcamp. It was almost palpable during the continuation meeting (2.0-C-T3) as illustrated in Vignette 3.

2.5.4 Containment in the Interpreting Phase

In the following phase interpreting the implications (C), tensions revolved mainly around 'timing and tempo differences' (T3). Peculiarly, after both bootcamps that ended in a celebrative exposition, the frontrunners behaved as if the job was done (C). They returned to their operational duties to catch up on overdue work. We do not wish to discount their work ethics, but to understand the probing practice better it is worthwhile to consider other explanations than simply too much operational work. In meetings after the bootcamp, the frontrunners discussed whether or not the mission had been accomplished thereby reluctantly doubting the approach. As described above, we perceived this as a lack of trust in the approach. In this context, they seemed to forget that perhaps the most important part of the probing practice - interpreting - had yet to be performed. One explanation would be, that the client-contractor relationship played up again, causing the frontrunners to perceive a substantial role for the co-design researchers in this. In the second iteration though, this was less likely as equal partnering in co-designing the journey was woven into the practice supported by generative tools. Therefore, we suspect subconscious risk-avoiding dynamics at play, which we understand to be an order response to the interpreting phase.

Interpreting the implications of imaginative work for current practices takes effort and withstanding invoked anxiety around uncertain and unprecedented imagined futures. This time without the 'student buffer' that during the bootcamp offered a means to keep a certain distance. Timing and tempo differences due to operational tasks offered acceptable ways to circumvent entering what Wierdsma (2012) calls 'de plek der moeite', which can be translated as 'the place of effort'. The author introduces this concept in organisational learning to indicate the intractability of individual and collective learning processes as it comes to reflecting on the underlying principles and beliefs of their actions. The term 'effort' refers to both 'being worthwhile' to enter this place as breaking existing patterns offers opportunity for novel possibilities and

the trouble and courage it takes to face the relational entanglements of individual and collective perceptions, principles and beliefs (Wierdsma, 2012). In a similar way opening up current habitual practices based on institutionalised values and beliefs requires effort and is worthwhile because alternative possibilities can emerge and be embraced.

Beneficial enabling activities in this phase, such as group cohesion to delve deeper into themes and linking up with other groups working on similar themes internal or external to the organisation, were lacking. Nevertheless, the co-design researchers kept pulling the core team towards the unidentified potentials of the stretching phase. They must have thought they could energise the frontrunners' enthusiasm by giving a glimpse of such potentials and mobilising more students to compensate for the minimal time the frontrunners could invest, but containment issues were not properly addressed in the core team. Vignette 3 vividly illustrates this. The timing & tempo differences only grew stronger as the educational curricula imposed their time framings on the probing journeys. Rather than pushing the journey forward, the interpreting phase asks for longer periods of contemplation and reflection. While the core team acknowledged this, and working in probe labs with students was intended as such, the frontrunners felt pressured.

2.5.5 Containment in the Deepening Phase

Finally, in the deepening themes phase (D), tensions typically related to 'organising exploration next to normal work' (T4). The probe labs established in this phase were to provide opportunities to elaborate and delve deeper into insights and themes from the interpreting phase. Our findings show severe issues in probing 1.0 when the opportunity for ready-to-start student teams came unexpectedly early. While feeling overwhelmed, the frontrunners tried to gear up but lacked the resources. More interesting, however, is the probing 2.0 journey where the probe labs had been planned from the start, but were still not fully embraced by the frontrunners. Though they were able to mobilise resources to cooperate with the student teams, only one of the ambassadors actively continued participation but experienced difficulties as well in organising the 'extra' work next to his operational tasks. Other employees were willing to participate in a one-time sparring moment.

Retrospectively these events shouted for a pause, but in the heat of the moment, polite interactions smoothed the way to proceed though not wholeheartedly. As the co-design researchers followed the pacing of the student process, the frontrunners withdrew from attending meetings. As a consequence, their processes started to deviate more and more.

Over time, order responses exceeded enabling activities and the identified tensions culminated into proportions that were counterproductive to continuing the practice of probing alternative futures to pursue alternative courses of action towards more sustainable futures.

The early termination of the probing journey underscores the significance of consistently engaging in reflective actions to ensure containment. Despite clear intentions at the start and regular re-alignment of the core team, towards the end, the purpose of employing probing futures shifted. Where it started as a means to explore the future field of research and education attracting employees to embark on this journey for two years, it became a 'quick fix' to a culture change or at least a change of attitude on the work floor. This solution focus also encroached on the probing practice as shown by an increasing emphasis on discussing the probes as future solutions not relatable to employees' daily practice rather than sensing instruments to raise dialogue and sense what generates energy to probe further. This focus on short-term solutions at the expense of an inquiring approach changed the nature of the quest.

In our case, how the actors understood the purpose and working mechanisms of the cooperative probing practice mattered for being able to play in the opportunity tensions. What happened here, was not a shift from the unstructured to the structured domain, but a pivot to change the practice into a more linear, rational approach with fewer uncertainties. We believe, the contradicting claims about 'too far off probes' and 'not novel enough' resulted from the mismatch between challenge and approach. The underlying question then became whether 'containment' was enough to raise confidence among actors to resist this pull to order, which was not the case as probing ended.

2.6 Discussion

This study set out to understand why it is difficult to connect alternative future imaginations to everyday future-making practices to generate the emergence of sustainable futures. We explored how an established organisation, such as DigiOrg, engages in probing alternative futures to radically change their everyday future-making practices. We explored the challenges they encountered, how these surfaced in the organisation and how they responded to them.

2.6.1 Future-making as 'Doing Futures'

We advance research on future-making practices by studying imaginative work and future-making more holistically as generating the emergence of systems change (Bushe & Lewis, 2023; Lichtenstein, 2014). Previous work on future-making has focused on how organisations employ intentional shaping to devise strategies toward visionary goals, highlighting the tempering of ambitions with calculative tools and productive imagination (Beckert & Bronk, 2019; Rindova & Martins, 2022). Our research on probing imagined alternative futures in tangible experiential ways illuminates how organisations can pursue more ambitious alternative futures by withstanding organisational pull-to-order forces that tend to temper ambitions. 'Doing' alternative futures allows actors to embrace them, reject them or ignore them altogether by which they are making the future in a generative probe-sense-respond manner (Kurtz & Snowden, 2003). The probing approach performs or enacts futures – the doing – to trigger reflection – the thinking, not the other way around.

Our research suggests that probing imagined alternative futures created conditions for emergence and self-organisation. Eoyang's (2001, 2007) CDE model distinguishes three conditions for emergence in human system dynamics: container, diversity and exchange. First, the cooperative future probing practice provided a container that held actors together working on the same challenges inducing them to meet regularly. Second, the diversity of involved actors (DigiOrg's employees, co-design researchers and creative students) and the purpose of exploring alternative rather than conventional futures created significant differences to challenge the status quo. Third, the use of generative tools during organised events facilitated an exchange of 'energy' through deliberative and exploratory interaction.

The condition of significant difference arose from the dual factor of the innovative nature of the probing practice itself and the unprecedented futures represented by the student-developed probes. Firstly, the process of future-making through probe-sense-respond cycles diverges significantly from conventional approaches to engage with the future, such as future-perfect thinking and shared vision development (Costanza & Kubiszewski, 2014; Kantabutra, 2020; Kornberger & Clegg, 2011; Pitsis et al., 2003; Stam et al., 2014). DigiOrg, having a structured approach to innovation projects starting with formulating an end goal to achieve, faced the challenge of reflecting on established practices and adapting to this novel approach, thereby imposing pressure on the organisational system. Secondly, the content of the unfamiliar future probes – such as a contract enabling individuals to pursue an educational and working career supported by a big tech firm in

exchange for personal and medical data, or a DNA-guided digital assistant directing education towards everyone's full potential to enable a local community to thrive on its collective skills – placed pressure on the organisational system. This pressure stemmed from the revelation of alternative worlds based on novel constellations of values and beliefs that could be embraced, rejected, or ignored.

This pressure resulting from significant differences also stressed the importance of containment of the discomfort actors experienced when engaging with and discussing 'estranging' possible futures. To clarify, the tensions identified in our study signalled underlying order responses to the pressure invoked by the practice of probing futures. We, therefore, attribute it to the interplay between the novelty of the probing practice (process) and the provocativeness of the imagined futures (content). Probing alternative futures involves harnessing the energy generated by collective imagination, which fuels creative potential *and* provokes critical examination of unprecedented futures in a performative way. It draws attention to the experiential value (Candy, 2018) of performing or 'doing' alternative futures through probes or artefacts (Riemer et al., 2023). As future probes provoke emotionally visceral responses due to their capacity to ' estrange the familiar' (Hovorka & Peter, 2021), they tend to induce feelings of discomfort and psychological anxiety (Hirsh et al., 2012). Containment of such feelings is necessary to endure the discomfort and uncertainties long enough to evoke emergence and possibly amplification of desirable interaction patterns. Without sufficient containment, emerging novelty that may be interesting to explore further will dampen.

2.6.2 Containment in Future-making

Our insights contribute to the discourse on future-making by highlighting the difficulties around stretching to genuinely alternative futures (Hajer & Versteeg, 2019) and generating the emergence of alternative sustainable futures in a probe-sense-respond manner (Kurtz & Snowden, 2003). Recognising that what people imagine may influence their intentions and planning activities (Szpunar et al., 2014), the stretching issue is often conceived as impaired cognitive ability. This cognitive attribution is further motivated by the fact that human imagination is the result of reorganising past knowledge and present situated experience into something new (Schacter & Addis, 2007). However, we relate the stretching issue to a constant pull to order and conventional futures rather than stretching towards genuinely alternative futures. Such a conceptualisation offers a relational understanding of the lack of imagination rather than dismissing actors' cognitive capacities. Although decoupling from lived experience is hard, our research showed that designerly tools

offer support to endure the effort needed to stretch. Furthermore, the students were valuable assets in the practice of probing futures to stretch imagination by developing unsettling, provocative probes, discuss them with the broader public and feed the conversations with employees with their insights.

Generating emergence relates to imagining alternative futures and probing their implications for possible courses of action to challenge the status quo. Actors can intentionally pursue generative emergence by creating “the conditions for emergent ideas and action to occur” (Lichtenstein, 2014, p.396). In our case, the novel future probing practice pressures the operational system of the organisation by generating ‘opportunity tension’ (Lichtenstein, 2014) causing a pull to order. Such pull-to-order typically surfaced as risk mitigation and control activities (Uhl-Bien & Arena, 2017), such as we saw when frontrunners called for more structure and planning at the end of the first iteration (phase D, T4) or during the bootcamp when participating employees tended to ‘torpedo’ students’ provocative ideas about possible alternative futures by pulling them towards conventional probable futures (phase B, T2). Containment is needed to resist the pull-to-order to allow “organising energy” to drive generative emergence (Lichtenstein, 2014, p.405).

Containment of surfacing psychological discomfort and emotional responses is essential to stay with the trouble of unsettling possible alternative futures (Haraway, 2016). Yet, we found that establishing a psychologically safe space, to imagine, endure and inquire into alternative future imaginations tends to invoke organisational order responses and is challenged by tensions in containment (Eoyang, 2001; Ladkin, 2013). It is common to have psychological anxiety from estranging future possibilities (Hirsh et al., 2012) and subsequent pull-to-order responses (Uhl-Bien & Arena, 2017). They can be mitigated by appropriate enabling activities for which continuous reflective action is required. The process model we provide helps to understand the relational dynamics and organisational forces in terms of containment. Such an understanding supports reflection on actors’ responses in the cooperative future-making practices allowing actors to be alert for order responses and actively seek and conduct enabling activities. It also explains that when order responses keep prevailing at the expense of enabling activities, it will be harsh to maintain a level of togetherness able to sustain playing in the tensions. As explained in the previous paragraph, playing with such creative tensions is necessary to generate emergence.

The literature on future-making shows above all the normalising effect of near-future imaginations on present courses of action which hardly trigger systemic

transformative change. For instance, Rindova & Martins (2022) productive and creative imagination inputs of an automotive firm and Pettit et al. (2023) imagining and adapting cycles of a sales and marketing subsidiary show how imagination is constrained to a firm's economic success. We contend that a focus on such success stories underexposes the difficulties of imagining and inquiring into genuinely alternative futures that challenge institutionalised beliefs and values and have transformative capacity. Hence, we suggest reticence to apply the future-making lens to organisational activities that barely challenge the status quo at the systems level. Instead, we support the call for more research into future-making that stretches imagination and challenges current value orderings (Gümüşay & Reinecke, 2024).

Gümüşay & Reinecke (2024) offer a framework for theorising futures with speculative rigour. Their suggestion to shift from projecting to imagination is congruent with other scholars' calls for more possibilistic and unconventional thinking (Dey & Mason, 2018; Grimes & Vogus, 2021). This is the kind of imagination stimulated by probing futures in this study. We have demonstrated that despite its challenges, the practice of probing futures offers a valuable way to scrutinise imagined alternative futures, which disclose new possible values worlds and thus are value-led, for their desirability. As such, the practice of probing futures might contribute to speculative theorising by engaging others in values conversations around future probes. We intend to conduct further research on the role of such values conversations and the possible challenges involved. We expect such challenges knowing from practice that engaging with 'preposterous' futures (Voros, 2019) is energising during facilitated bootcamps and workshops and in cooperation with enthusiast students, but expanding such values conversations in the 'real world' is not evident. During bootcamps postponing disbelief is actively stimulated in the cooperation between employees and students, but in the 'real world' dismantling institutionalised values and beliefs that dominate operational units of organisations is far more challenging.

2.6.3 Practical Implications

The insights about the need for containment when stretching towards alternative future imaginations to pressure an existing system offers several practical implications for organisations that wish to take the future seriously and struggle with the complex challenges along the way.

First, engaging with alternative futures demands stretching imagination towards inconceivable future possibilities. This inconceivability is related to our habitual thinking patterns and the anxiety produced when such are challenged. To

transform our current unsustainable practices, while keeping the once that are acceptable, people and organisations need to become aware of their thinking patterns. Preferably, this becomes a natural tendency for curiosity as one had as a child to discover the world by making unlimited associations.

Second, despite the effortful endeavour of practising future probing, working with enthusiastic creative students is inspiring and motivational to endure the discomfort. Students can function as a buffer between an organisation and the public audience and between intrapreneurial actors and management.

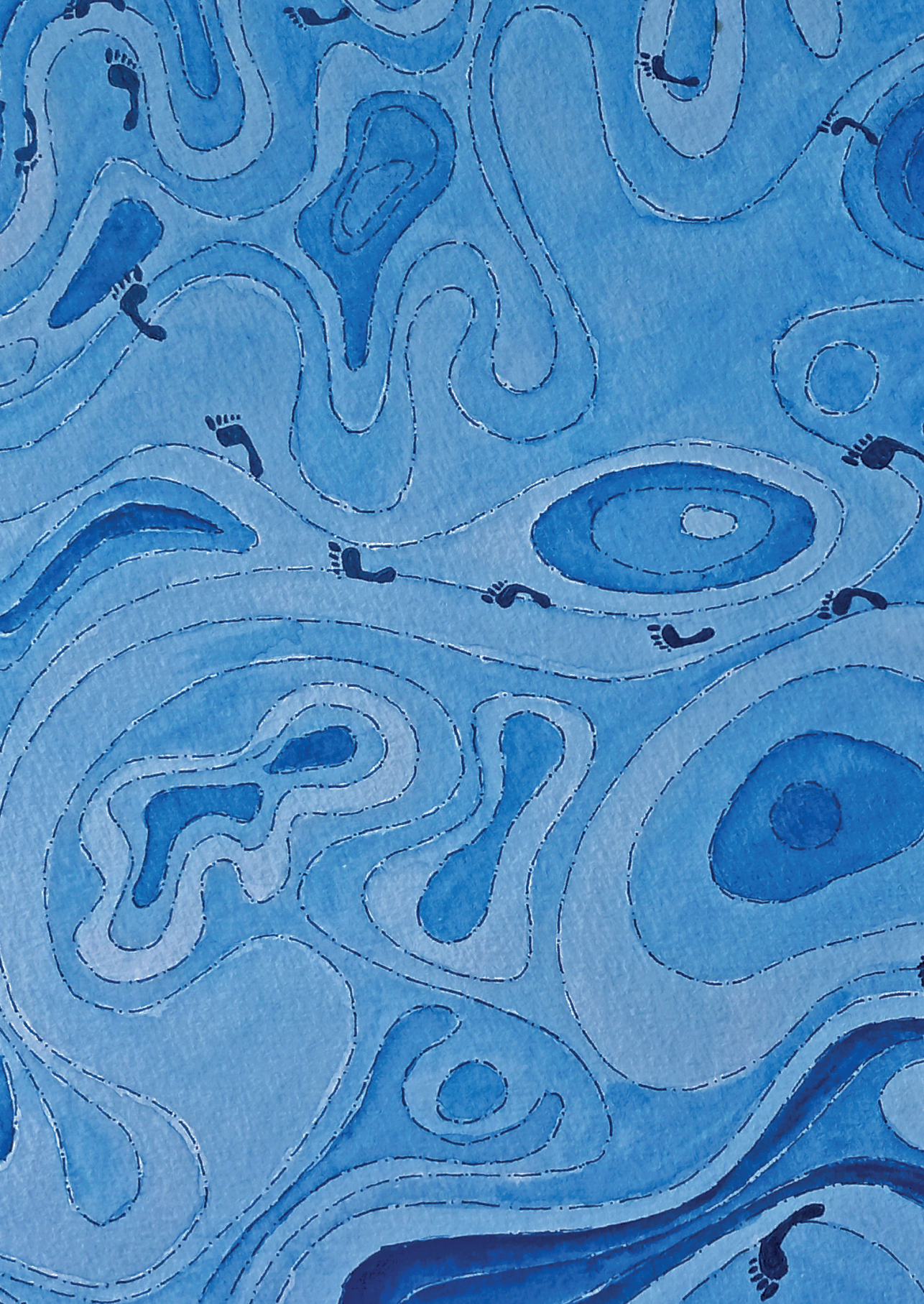
Third, while organisational change is often responsive to pressing environmental changes, the experiential encounters with alternative futures in probing futures offers an opportunity to connect at an emotional 'doing' level with new possible value worlds. As such, contextualised probes offer 'positive trigger events' rather than negative ones (e.g., crises) to spark change (Rush, 2022). This means, one does not have to wait until change incentive are so pressing that chaos is on the verge. Instead, there is time to explore such estranging futures in safe-to-fail environments and start acting with less obtrusive measures than when the futures catch up on reality.

Fourth, the working mechanisms of the probing approach to future-making diverge from usual practices aiming to establish a plausible course of action to some desirable future goal or vision. Visionary leadership works fine for structured challenges where good practices exist and can be applied after diagnosis of the problem or in controllable closed-loop systems. However, in complex systems and with complex challenges, a probing approach to future-making helps to identify emerging interaction patterns worth amplifying. A vision-based approach and a probing approach require different kinds of managing. Where visions are usually attractive for their content and perhaps personal characteristics of the visionary leader(s), probing requires managing conditions by enabling leadership. The latter focuses on relationships within and between groups and facilitates diversity and interaction in conversations around future probes. The content of those probes functions as conversation starters about what alternative actions one can take now, not as achievable 'dots on a horizon'. Actions are for instance concrete experiments to test assumptions that probes disclosed.

2.6.4 Boundary conditions

The boundary conditions of this study are shaped by the close collaboration with the frontrunners, where I navigated dual roles as both consultant and researcher.

This allowed for a deep, immersive engagement – a witness approach (Fachin & Langley, 2018) – that enriched the study's insights on containment. Partial auto-ethnographic data, such as my comments in the reflective communications, made me realise that throughout the process, both the frontrunners and co-design researchers, including myself, evolved our understanding of the probing practice. Initially, we treated "the future" as distant time horizons but gradually perceived futures as intertwined with the present (Emirbayer & Mische, 1998). The findings are thus a product of this collaborative, adaptive process and should be understood within the context of our shifting perspectives. Different methods or interactions might have led to alternative outcomes. The collaboration between the frontrunners and co-designers ended at the moment when this intertwined view of futures was about to be integrated with regular operational activities. While this move was intended to increase the participation of employees, it would presumably also have impacted the development and staging of the probes. One indication for this is the pimping of their coffee machine into a future 'replicator', which at the time was only seen as a promotion for the first bootcamp rather than as a future probe in its own right. Although the frontrunners reported it had generated some funny discussions, these were not leveraged into reflective dialogues to elicit patterns or themes to probe further.



3.

Future-making: Imaginative Work and Values Conversations

Abstract

Organisations have an important role to play in the deep transformative change deemed necessary to address complex societal grand challenges, yet lack the leniency for imagining genuinely alternative futures. Previous research studying organisational future-making practices have emphasised how organisations strike a balance between visionary ideas and practical implementations, but hardly problematise that this sustains current institutionalised values and belief systems. Conceptualising the lack of imagination as a relational issue rather than a cognitive incapacity, this study addresses how a public organisation stretches imagination through probing alternative futures to triggers value conversations and seeks to amplify this throughout their organisation to shape current future-making practices in the mobility domain. Our findings offer a profound understanding of the challenges, competing mechanisms and relational dynamics at play across three realms of future-making: the unreal, the as-if real and the real realm. We offer an empirical model of these entanglements and propose to extend its conceptual understanding as a framework for continuous future probing to instigate transformative change. Contrary to scholars who advocate prescriptive imagination and normative desirable future theories, we suggest probing alternative futures to make visible what is collectively not seen as condition for inquiry, dialogue, emergence and self-organisation.

A previous version of this chapter with a different conceptual framework was discussed at the PROS Symposium as:

Maessen, C. (2023). *Future-making practices: temporal work and moral legitimacy*. Paper for PDL at 14th International Process Symposium (PROS), 2023, Chania, Greece.

3.1 Introduction

Pressing societal issues such as climate change, resource depletion, and social inequality necessitate transformative change within organisations (Gümüşay et al., 2022; Levy & Spicer, 2013). Despite their significant role in perpetuating these challenges, organisations also possess the potential to mitigate their impacts (Gümüşay et al., 2020). However, many organisations tend to ‘pull to order’, employing risk mitigation and control practices to maintain stability (Uhl-Bien & Arena, 2017) and upholding existing beliefs and values that prioritise economic growth and profit (Beckert, 2021; Goldstein et al., 2019; Nyberg & Wright, 2022; Wright & Nyberg, 2017). This underscores the need for a radical departure from current trajectories, prompting a re-evaluation of approaches to urgent issues and associated grand challenges (Ergene et al., 2021; Howard-Grenville, 2021b; Jarzabkowski et al., 2021), while leveraging insights from complexity and systems thinking to address the wickedness of grand challenges (Ferraro et al., 2015; Grewatsch et al., 2023; Pradilla et al., 2022).

Traditionally, organisations have relied on linear methods to navigate the future, striving to predict it with precision (Wenzel et al., 2020). Forecasting, for example, involves extrapolating from past and present data (e.g., calculative projections) to inform strategic and contingency planning. This approach typically yields plausible futures that align with existing organisational frameworks and norms (Urry, 2016). In contrast, foresight focuses less on prediction and more on exploring multiple uncertain scenarios (Fergnani, 2022), yet it still assumes a linear expectation that one of these scenarios will materialise, neglecting the possibility of unprecedented outcomes (Wenzel, 2022). By treating the future as distant and predictable, linear approaches encourage organisations to develop plans based on anticipated outcomes or engage in teleological planning aimed at achieving or avoiding particular future states. However, complexity theory reveals nonlinear relationships among past, present, and future (Lord et al., 2015), challenging the notion that the future can be effectively managed through planning processes. According to Wenzel et al. (2020) organisations struggle to come to terms with the plurality of future-making practices and future imaginations this view has brought forth. Taking a practice perspective on future-making (Wenzel & Krämer, 2018), this study explores how frontrunners within established organisations engage in imaginative work to reconsider institutionalised beliefs and values in which organisational future-making practices are embedded.

Previous literature on future-making indicates that fiction and imagination influence present actions by crafting narratives consistent with current empirical data (Beckert, 2013). Studies on future-making within organisations highlight the interaction between imaginative work and daily future-making practices in envisioning and shaping potential futures (Alimadadi et al., 2022; Comi & Whyte, 2018; Thompson & Byrne, 2022; Wenzel et al., 2020). Organisational contexts, considered as a bundle of processes, practices and institutions, constrain imaginative efforts towards plausible futures that motivate action (Rindova & Martins, 2022). Beckert (2021) stresses the importance of credible fictional narratives in driving organisational action. Additionally, empirical research shows how visual representations are used to align organisational actors around feasible courses of action (Comi & Whyte, 2018). Despite engaging in imaginative thinking, organisations tend to prioritise near-term feasible futures, striking a balance between visionary ideas and practical implementation (Pettit et al., 2023). This body of work demonstrates how imaginative constructs, informed by current data and organisational settings, shape present decisions towards desired future outcomes, but does not question organisational constraints on imagination in relation to potentially unfolding futures.

In the context of transformative change for a more sustainable future and associated grand challenges, it is troublesome that organisations lack the leniency for achieving genuinely alternative possibilities due to a lack of imagination (Hajer & Versteeg, 2019). Specifically, because they are powerhouses in exerting agency on the way society is organised, or in Beckert's (2021, p.13) words: "Organisations are foremost engines of imagination, framers of the future that exercise their power on the social world through their influence over the imagination of their own members and of outside stakeholders". Beckert (2020) recently suggested that the lack of imagination might not be a cognitive issue but rather stems from the entrenchment of economic and political structures that forecloses change towards alternatives.

In this study we conceptualise the lack of imagination as a vast pull to order indicating forces between explorational and operational organisation units that attempt to restore stability and resist transformative change (Uhl-Bien & Arena, 2017). While 'lack of imagination' resonates with the challenge of imagining genuinely alternative futures that trigger conversations about unprecedented values constellations (Hovorka & Peter, 2021), 'pull to order' underscores the challenge of amplifying such values conversations across organisational units and beyond to instigate transformative change. Though there is some research

on how non-linear distant future imaginations become performative through dialectical processes of contestation and synthesis on a societal level (Augustine et al., 2019) that we can draw from, this research does not address on a practice level how organisations shape and are shaped by the alternative value worlds such unconventional imaginations disclose.

The challenge of changing institutionalised beliefs and values comprises two parts of overcoming the above-described lack of imagination. First, it requires stretching imaginative work to render conceivable possible non-linear futures (Augustine et al., 2019) or 'other' worlds with unprecedented values orderings (Hovorka & Peter, 2021). Second, it requires the amplification of this conceivability across the organisation (and beyond) to open up institutionalised beliefs and values that drive current future-making practices to allow for alternative decisions and actions in the present. To explore how organisations engage in this puzzle, we study how they engage in the practice of probing futures guided by the research question:

How does imagining alternative futures shape and get shaped by values conversations in future-making?

Probing futures practice combines methodology from future and design studies (Candy & Dunagan, 2017; Kyffin & Gardien, 2009) with insights from organisation studies on navigating complexity (Eoyang, 2011; Snowden, 2005; Stacey, 1995; Uhl-Bien & Arena, 2017). It uses conceptual probes or artefacts from the future (Hovorka & Peter, 2021) to bring possible alternative value worlds into present discourse. This makes values conversations immanent in the practice as probes are designed to provoke dialogue. This can be understood as value practices aiming to identify pockets of concerns and knotting them into action networks (Gehman et al., 2013), yet with the intention to instigate system-wide change. Unlike imaginative work that imagines desirable futures as a distant entity to backcast possible teleological pathways as suggested by some scholars (e.g., Gümüşay & Reinecke, 2022), probing involves folding imagined future times onto the present to actively experience, scrutinise and possibly embrace it. As such, future probing aligns with an inquisitive approach to future-making (Whyte et al., 2022). Yet, rather than achieving a defined goal – such as developing the Kew Gardens (Comi & Whyte, 2018) or restoring the Westminster Palace (Alimadadi et al., 2022) – our research focuses on the intention to change institutionalised values and beliefs that limit genuinely alternative courses of action (Kooijman et al., 2017).

This study contributes to organisational future-making literature by addressing overlooked differentiation in stretching imagination beyond current economic paradigms (e.g., Beckert, 2013; Pettit et al., 2023; Thompson & Byrne, 2022), by offering a deep understanding of how values conversations intersect with imaginative work and relational dynamics in shaping futures. It responds to calls for reinventing academic approaches (e.g., Howard-Grenville, 2021b) and actively shaping social reality through research (Gümüşay & Reinecke, 2022). Our empirical model emphasises the importance and challenges of engaging with unprecedented alternative future imaginations to reconsider institutionalised beliefs and values in sustainable futures contexts. These challenges hinder values conversations across three realms—the unreal, as-if real, and real realms—with various pull-to-order dynamics impeding change in institutionalised beliefs and values. Furthermore, this study suggests that future probing practices, despite their challenges, offer a valuable approach to navigating future uncertainty and addressing complex grand challenges.

Next, we link the notions of *imaginative work* and *values conversations* to the literature on future-making and values work. We then describe our interpretative methodology, introducing the context of the mobility system and future probing practice, and explaining how we interpreted the observed phenomena from our data. In the results section, we show how imaginative work triggers values conversations varying over three realms of future-making – the unreal, the real and the as-if real realm – hampered by pull-to-order forces, and present our empirical model. Lastly, we discuss our interpretations relating them to evolving discourse on values in future-making (Rindova & Martins, 2023; Whyte et al., 2022) and transformative change in the context of grand challenges.

3.2 Theoretical Background

3.2.1 Imaginative Work and Future-making

The future-making practices approach draws attention to the interplay between imaginative work and everyday organisational future-making practices in an ongoing inquisitive process (Wenzel et al., 2020; Whyte et al., 2022). In this perspective, the future is part of the present. Its underlying non-rationalistic view of the future draws from pragmatist and phenomenological traditions, emphasising the inseparability of knowing and acting in the world and the importance of individual experiences (Whyte et al., 2022). Future-making has been positioned between building and dwelling approaches to the future (Comi

& Whyte, 2018). While building approaches, such as foresight, emphasise thinking about possible futures to plan or prepare for (Tsoukas & Sheperd, 2004), dwelling approaches emphasise doing work of habituated actors that shape the future from spontaneous emergence (Chia & Holt, 2006). Future-making practices emphasise the interplay between both imaginative thinking-work and shaping doing-work in how the future is produced and enacted (Wenzel et al., 2020) as part of everyday organisational life.

Imaginative work in future-making offers ample opportunity to take a more proactive approach to shaping social reality rather than studying reality-in-the-making (Gümüşay & Reinecke, 2022) by carefully choosing the cases to study. Yet, we argue that the imaginative work in most empirical studies on organisational future-making is not 'distant' enough, as meant in the work of Augustine et al. (2019) on geoengineering, to break away from current pathways to the future. To explain, Augustine et al. (2019) build on Trope & Liberman's (2010) construal-level theory to argue that distant future imaginations – non-linear, abstract, possible, value-based leaps into the future – are qualitatively distinct from near-future imaginations – linear, concrete, probable, extrapolations of past and present experiences. Mind that this distinction of distance is one of perceived distance to psychological lived experience at the moment of conception. While Augustine et al. (2019) do not explicitly address to whom future imaginations are distant, their case on geoengineering refers to societal-level imaginaries. In contrast, the work on organisational future-making tends to use the concept of 'distant futures' for all imagined futures alternative to an organisation's current state, yet with limited attention to disruptive implications of radically different futures.

To elaborate, imaginative work in the literature on future-making practices often fits within dominant neo-liberal institutions. For instance, Thompson & Byrne (2022) focus on business modelling activities of start-ups with no particular ideologic angle (except maybe the ethical clothing brand) and Pettit et al. (2023) study a sales and marketing subsidiary. These cases elicit the constraining effects of thinking about possible futures and values that benefit the organisation's survival and profit. Scholars present insights and models incorporating such constraining effects, exemplifying how organisations currently engage in future-making practices, without questioning how such contributes to macro-level change. We regard organisational constraining effects from institutionalised values and beliefs as typical organisational pull to order – i.e., maintaining stability and resisting transformative change. In the context of sustainable futures, we regard this

problematic as it tacitly reinforces institutionalised beliefs and values that hamper deep transformative change (Loorbach, 2022).

On the other hand, theoretical future-making models offer valuable insight into how future imaginations can shape future-making practices potentially leading to strategic change in organisations. Prior research on future-making often suggests distinct phases or realms of engagement with imagined futures, though precise dynamics depend on the organisational context. Rindova & Martins (2022) theorise how different types of imaginative work – productive and creative – can lead to strategic narratives that potentially drive action, although their automotive examples could also be interpreted as retrofitted narratives to justify actions. In a similar vein, Pettit et al. (2023) have empirically modelled how an organisation connected imagined desired futures to more probable courses of action through ongoing iterative cycles of imagining and adapting expanding across organisational spaces. Such models support Whyte et al.'s (2022) non-rationalistic conceptualisation of future-making as a form of ongoing inquiry, which aligns with a process ontology and complexity dynamics. However, the above-mentioned models do not address the difficulties and failures that Whyte et al. (2022, p.7) foresee but do not elaborate on, especially regarding “critical thinking and questioning long-held assumptions and values”.

Our research applies a more nuanced view distinguishing conventional from alternative future imaginations and focuses particularly on the challenges that actors encounter when engaging with alternative future imaginations. We focus specifically on how probes, which are artefacts from the future (Hovorka & Peter, 2021), move through iterative cycles – beginning with their development through imaginative work (Kyffin & Gardien, 2009), then being used to bring imagined alternative futures into dialogic inquiry, ultimately to trigger action within organisational practices (Whyte et al., 2022). Through these cycles, probes aim to open up actors' imagination, facilitating a process that transitions from imagining particularly unconventional possibilities to sensing and responding to current contexts (Snowden & Rancati, 2021). We seek to understand how future probing practices empower actors to engage in imaginative work that challenges existing institutions values and beliefs, ultimately shaping and being shaped by organisational future-making practices.

3.2.2 Values Conversations and Future-making

Acknowledging the value-ladenness of imagined futures, most future-making practices scholars seek to explain how organisations attempt to align imagined

futures with internalised core values rather than change them. Therefore, using future imagination to critically reconsider and change institutionalised beliefs and values remains underexposed. This study addresses that gap by designing the research around the practice of probing futures that aims to explore and scrutinise possible alternative future value constellations (see also method section).

Transforming institutionalised beliefs and value systems requires shifts at individual, organisational and societal levels. Institutionalised beliefs and values underpin to a large extent the way people act in the world. They are reflected in organisational and social systems and structures that enable people and things to interact more or less intuitively based on common tacit knowledge, expertise and experience. While human agency allows individuals to act differently, deep transformative change of institutionalised beliefs and values is necessary to collectively act differently (Loorbach, 2022). A cognitive shift in people's self-schema and value systems is often invoked by a crisis (Yaden et al., 2016). Rush (2022) on the other hand, points to 'positive trigger events' sparking transformative change, similar to the 'overview effect' that astronauts often experience when they see the Earth from space. Taking this further to constructing alternative futures, we ask ourselves under what circumstances such alternative future imaginations may invoke similar 'awakenings'.

Furthermore, value systems are socially constructed (Suchman, 1995), which implies that individual cognitive schema and frames matter, but understanding their interaction with societal and organisational structures is equally important. Beyond the scope of this chapter, previous research has linked the concepts of social imaginaries, value regimes and social movements theory to change efforts on a societal level (e.g., Augustine et al., 2019; Levy et al., 2016; Levy & Spicer, 2013). We draw on institutional and practice perspectives on the organisational level. While both perspectives acknowledge the mutual constitutiveness of structure and agency as suggested by Giddens or Bourdieu, institutional researchers have emphasised the role of institutions and practice researchers have emphasised the role of deliberate human action. The notion of social-symbolic work as "purposeful, reflexive efforts of individuals, collective actors, and networks of actors to shape social-symbolic objects" brings them together (Lawrence & Phillips, 2019, p.31).

Previous literature on the institutional perspective has drawn attention to the enabling and constraining aspects of beliefs and values in transformations. Traditionally institutional theory emphasised the rigid and often stifling effects of institutions on organisational life, but neo-institutionalism has nuanced this view emphasising how intra-organisational dynamics may later institutions

(Greenwood & Hinings, 1996). Conflicting institutionalised beliefs and values can be a major obstacle to the required transformation but can also be leveraged into a better understanding and novel ideas for complex challenges through social-symbolic work (Lawrence & Phillips, 2019). For instance, assuming that current strategic approaches to climate change are driven by market-driven logic – i.e., institutionalised values, beliefs and assumptions – Gümüşay et al. (2020) suggest that applying environmental logic highlights different definitions and possible scenarios. Pointing to the macro-level positioning, contextuality, temporality and value plurality of institutional logics the authors call for a “more fluid understanding of logics – an understanding that more closely reflects social reality and offers insights into the impetus for social change as well” (Gümüşay et al., 2020, p.14).

Practice researchers have drawn attention to deliberate human action to change institutionalised beliefs and values through social-symbolic work. The practice perspective is reflected in the notion of values work (Gehman et al., 2013). Values work distinguishes itself from cognitive and cultural perspectives on ostensive values (e.g., Schwartz, 1999) by highlighting the performance of values through value practices. Research on values work is intricately linked to institutional contexts (Askeland et al., 2020). The focus on values practices highlights how values change from the interaction between bottom-up processes and top-down support. (Gehman et al., 2013) delineate value practices as the doings and saying by which actors negotiate what is valued and why, and make values recognisable by others. Espedal (2020, p.43) expands this definition by denoting the normative guidance that values offer as ideals or desirables, and hence “orient values practices towards standards for behaviour and the capacity to imagine alternative possibilities for future actions”.

Combining these institutional and practice-based understandings sparks empirical questions about how actors proactively challenge existing constellations of beliefs and values in society and inquire into emerging ones to invoke transformative change of institutionalised beliefs and values. We address these in our study on future probing, which deliberately investigates ‘other’ value worlds. Values conversations are immanent in probing futures as the probes are designed to provoke dialogue about possible ‘other’ value worlds. Leveraging future inquiries into action necessitates values practices such as values conversations and broadening engagement (Gehman et al., 2013). In this vein, future probing triggers values conversations that potentially generate what Gehman et al. (2013) identify as ‘pockets of concern’ and which may over time become ‘knotted into action networks’. Dialectical interactions between individuals and their social collective constitute, maintain and change

values (Askeland et al., 2020). Our empirical work seeks to understand how values conversations fulfil their mediating role in connecting alternative future imagination with future-making practices.

3.3 Methodological Approach

3

Taking an interpretative approach, we followed the future-making practices of a group of frontrunners at PublicOrg. Perceiving this as a case of future-making allowed us to theorise the phenomena we saw from a process-as-activity perspective highlighting the mutual constitutiveness of probing activities and ongoing future-making processes (Langley, 2021). This case is representative of future-making practices (Wenzel & Krämer, 2018) as the organisation by virtue of its public role takes responsibility for addressing transformative change towards a sustainable future in mobility. Furthermore, the case reveals practices of fictional expectation (Beckert, 2021; Gehman et al., 2022) through the probing practices that the frontrunners engage in to imagine and explore alternative futures. The interplay between alternative future imagination and future-making practices ensues from the frontrunners' mandate to innovate current practices in the organisation which in turn influences the future-making practices of the organisation as a whole and the frontrunners in particular. The practice approach draws attention to how futures are socially constructed and enacted in the interaction between knowledgeable agents (Comi & Whyte, 2018). As future probing is new to the frontrunners, our observations are particularly revelatory for how the practice evolves as the group absorbs the new practice into their way of working (Nicolini, 2012).

3.3.1 Research Context

The frontrunners sought to better understand and concretise early signals of emergent alternative values in society that they had picked up, e.g., flight shame, restricting cars in city centres, increased use of digital technology and AI in public spaces, and a voice for future generations and non-human actors. Recognising the importance of engaging in the challenging space of unlimited possibility, they deliberately chose to step into this 'zone of discomfort' through the practice of future probing. Part of the future probing approach was employed in cooperation with students harnessing their creativity in bringing imagined possible futures into the present for inquiry (Whyte et al., 2022). The frontrunners expected to take probes and insights further into their organisation to provoke conversations about its implications for future-making practices.

Mobility System

The current mobility system is exemplary of the complex entanglements and wickedness of grand challenges (Ferraro et al., 2015; Pradilla et al., 2022) in need of transformation into more sustainable practices. On the one hand, the mobility system faces multiple challenges such as air quality, congested roads, and cyber-attacks, while cities struggle to provide safe, clean, reliable, efficient, affordable, and inclusive transportation. On the other hand, mobility has also contributed immensely to the emergence of grand challenges due to increasing use of fossil fuels and associated emissions. The focus on road and air traffic since the previous century and the growth of prosperity at least in Western societies have reinforced each other, creating such challenges. Addressing the complex entanglements of these challenges requires transformative change in the way society behaves and talks about mobility (Loorbach, 2022). Traditionally mobility has been seen as the motor of the economy for without it all activity in the world would grind to a halt. Keeping things mobile has led to a dominant focus on increasing road infrastructure and traffic circulation. Current sustainability approaches focus on reducing emissions, for instance by electrifying vehicles, while still enabling traffic increases. Yet, mobility reaches beyond efficient transportation – i.e., getting stuff and people from A to B. Mobility is a means to support people in their personal development and well-being, their social relationships with others and access to basic needs. Concepts such as ‘mobility-related exclusion’ (Kenyon et al., 2002) suggest that such a one-sided focus on reducing emissions does not benefit marginalised groups. The beliefs and values reflected in the rules, regulations, procedures, and practices established in the mobility sector need to change to transform the mobility system into a more sustainable one, in its broadest sense.

Future Probing

The practice of probing futures uses probes or artefacts from the future (Hovorka & Peter, 2021) to inquire possible alternative futures in the present (Whyte et al., 2022). Such imaginations do not serve as fixed points on a horizon to work towards but as probes or artefacts from possible future worlds that feel alienating in our current world. As a glimpse into worlds with different constellations of values, probes tend to elicit visceral responses (Hovorka & Peter, 2021). This generates momentum for discussing current institutionalised beliefs and values and exploring, questioning, contesting, and negotiating the alternatives represented by the probes (Comi & Whyte, 2018). The performative function of the future probe and the visceral response of the body distinguishes future probing from cognitive approaches treating the future as an entity separate from the present. The practice of probing futures is in line with a process ontology that regards the world in a constant state

of 'becoming' (Tsoukas & Chia, 2002), the unity of past, present, and future in our everyday situated actions and agency as the ability of human and non-human actors to do things differently. Consequently, this future-making practice aligns with a complexity ontology perceiving a continuously flowing time-space in which a plurality of potential futures exerts agency on the present (Lord et al., 2015).

We conceive future probing as a practice to probe, sense and respond to complex challenges (Kurtz & Snowden, 2003) in uncertain and unknowable futures. As future probes give access to other possible worldviews and challenge current ones, they can generate emergence (Lichtenstein, 2014). In a system that is poised for change, such as the mobility system under threats of climate change and resource depletion, such pressures potentially instigate change (Plowman et al., 2007; Uhl-Bien & Arena, 2017). In this view, future probing is a delicate and intuitive endeavour to create and follow energy amongst actors in the system. This is fundamentally different from rationally predicting or anticipating the future as accurately as possible to prepare contingency plans (Wenzel, 2022) or prefiguring a desirable future to backcast teleological pathways to achieve such a future (Sharma et al., 2022). It foremost aims to broaden actors' imagination, triggering critical dialogue (Balcom Raleigh & Heinonen, 2019) and infusing it throughout the system.

3.3.2 Data Collection

The data was collected between July 2019 and Februari 2022 and grew from participatory observation of the future probing iterations in which frontrunners cooperated with students into an organisational ethnography of the follow-up within the team of frontrunners. The second probing iteration took place as the researcher was engaged in the team as organisational ethnographer. Next to observing the probing iterations, the author lent her probing expertise to the students and explained future probing to the frontrunners. Furthermore, the author was part of the analysis team of the student work after both probing iterations.

During the first probing iteration, data was collected during interactions between frontrunners and students during probe development, frontrunners engaging in the probing practice during a workshop, interactions between frontrunners, students and visitors at the exhibition at PublicOrg and during the evaluation between lead frontrunners and the university (Table 3). In a similar vein, data was collected during the second probing iteration (Table 3), which took place during the Covid-19 pandemic, with interactions taking place online. At the same time ethnographic data were collected while monitoring the frontrunners team during their regular work meetings, which also moved online due to the pandemic measurements.

Ethnographic data that involve Covid-experimenting, as a manifestation of previously explored 'non-mobility', and a specific probing follow-up workshop are particularly relevant to this study (Table 3). Observational data were complemented with 8 interviews of which one was a group interview, 230 documents about input for and products of the probing iterations and other material, such as 206 photos of sketches, mock-ups, stories, probe artefacts, posters, insights and quotes. Table 3 gives an overview of the data and their use in analysis.

3.3.3 Data Analysis

We analysed our data in iteratively going back and forth between our data and the literature. Using abductive analysis (Timmermans & Tavory, 2012), we allowed theoretical frameworks to shape our interpretations, with the selection of these frameworks being guided by the data. We explicate our line of reasoning with examples from the data. Focusing on probing alternative futures, we also considered other future-oriented practices to contextualise our understanding of how the frontrunners operated. Our analysis involved five iterations.

Iteration 1: Distinguishing Values Conversations

First, we familiarised ourselves with the data by identifying the different kinds of alternative future imaginations – i.e., probes and probe ideas – that had been produced during the two iterations of practising probing futures from archival data. Matching responses they had triggered, as captured in our observational notes and recordings, surfaced different initial responses during probe development distinguishing highly speculative probes, e.g., neuro-stimulation or chip implants, applied in unorthodox environments, e.g., a virtual mobility dream station, from more familiar probes, e.g., booking a timeslot to use the road similar to booking a flight. We also noticed that conversations around probes at the exhibitions differed as visitors tried to relate them to present reality eliciting positive and negative valuations. For instance, a probe representing governmental restrictions on choosing modes of transportation invoked resistance, while a probe enabling limited choice was embraced as helpful to change behaviour. Such differences led us to consider the role of values conversations in future-making practices.

Noticing a remarkable shift in responses among frontrunners after the exhibitions, we zoomed in to dissect the underlying dynamics. Probes that had previously sparked dynamic conversations were now trivialised as 'naive student work' by some. Our analytical focus deepened as frontrunners began scrutinising the accuracy of probing implications for future-making, treating the probes and insights as predictions rather than contestable possibilities. This change in behaviour was

Table 3 - Data sources Study 2

Data source and description	Analytical use
Observations during Probing iteration 1.0 Two-day challenge on location; 4 weeks of student work; Student Expo at studio; Probing workshop with frontrunners (notes, photos, artefacts). Final Expo at PublicOrg (partially recorded, notes, photos, artefacts); Evaluation session (recorded, transcribed) (21 hours: P1#2-7)	Observations were the primary data source providing input for identifying critical events and activities, and how values conversations varied over time in relation to events, activities and contexts. Detailed fieldnotes provided insight into the dynamics of activities, challenges and competing mechanisms. Together with transcripts of audio (occasionally, visual) recorded sessions they enabled real-time and over time tracing of processes. Informal conversations were documented afterwards and served as background information on individual experiences during Covid experimenting.
Observations (online) during Probing iteration 2.0 Activity planning session (recorded); Provocative Q session A (recorded); Sprint sessions 1 and 2 (recorded); Evaluation session (recorded) (18 hours: P2#1-5)	
Observations as part of organisational ethnography at PublicOrg - Online Covid-experiments team meetings (5 hours: M#1-4); - Probing follow-up online workshop (recorded) (2 hours: M#5); - Regular team meetings, including Covid probing experiments (approx. 90 hours during probing period); - Participating in Covid experimenting festival; - Informal conversation during drinks both on- and offline.	
Observations outside PublicOrg One-day congress, Big Improvement Day 2020; HU UAS Utrecht - Community meeting Smart Urban Mobility 2020	Provided background information on how frontrunners presented probing trajectory to others.
Interviews- 6 in-depth interviews with frontrunners (+ 60 minutes; 5 audio recorded and verbatim transcribed, 1 through notetaking) - 1 interview with not-fronrunner member of Covid experiments team (30 minutes; telephone, audio recorded), with additional answers by mail. - 1 group interview with Covid experiment team (45 minutes; online, notetaking) - 6 non-probing related interviews with frontrunners (during probing period) (45-60 minutes, audio recorded, verbatim transcribed)	Provided information on individual perceptions of the probing practice, specifically regarding the collaboration with students; the experiments approach and responses within the organisation. The non-probing interviews gave contextual information about procedures and ways of working and occasionally individual reflections on the probing practice.
Documents and other material - > 500 pages of probing related documentation (e.g., weak signals, what-if questions, probing research material, probing insights, and presentations), - 206 photos of the probe developments (e.g., sketches, mock-ups, stories, posters, and quotes), - access to students' websites documenting progress. - further archival documentation entailed for example content-analysis of the student work, reports and evaluations as well as communications promoting the probing events	Visual mapping of timeline of events and activities as a reference base for zooming in and out on practices and events.

particularly noticeable during the workshop addressing the transition from probing to dialogue with operational civil servants to instigate a change of future-making practices. We decided to trace how differences in value conversations related to different phases in the probing approach.

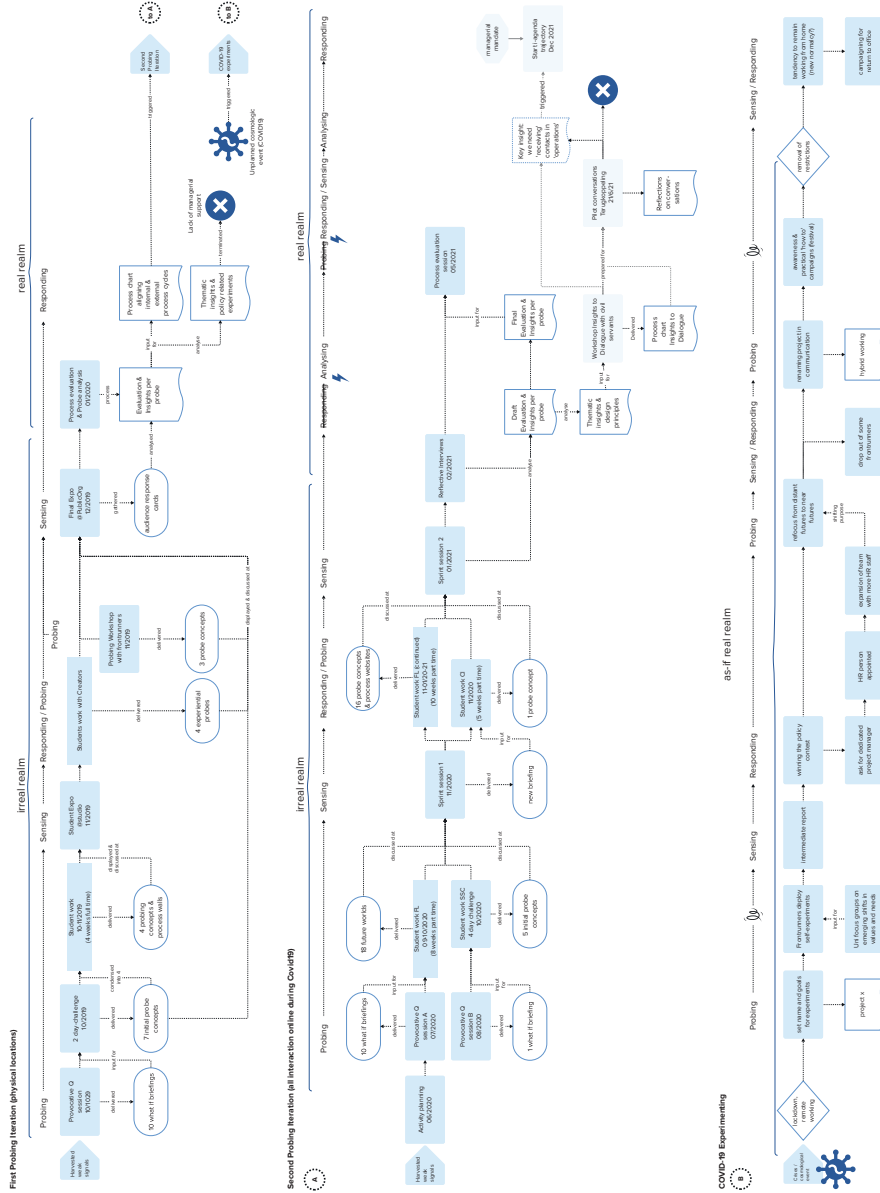
Iteration 2: Tracing Values Conversations Across Realms of Future-making

Using visual mapping and temporal bracketing (Langley, 1999), we created a timeline of activities from our observational field notes, interviews and documentation and bracketed three stages (Figure 7). These stages emerged empirically as phases of engagement that we conceptualised as Irreal Realm, Real Realm and As-if Real Realm. Each realm reflects different interactions with future-making practices observed in our data, aligning with Emirbayer and Mische's (1998) concept of the 'chordal triad', where agency integrates past, present, and future engagements. The 'Irreal Realm' captures the projective dimension, focusing on imaginative, unconstrained conversations about alternative futures that serve as sources of inspiration and conceptual exploration, as seen during probe development and exhibitions.

The 'Real Realm' embodies the practical-evaluative dimension, where value conversations around imagined futures were often dodged after being informally weighed against real-time constraints and organisational realities (Lord et al., 2015). The 'As-if Real Realm' emerged as actors engaged with pressing real-world conditions during the COVID-19 pandemic, drawing inspiration from earlier imaginative conversations. These conversations, influenced by experiments initiated in the new situation. Although the pandemic triggered immediate changes, actors often approached these adaptations with a mindset of temporary measures, anticipating a return to 'business as usual' once conditions normalised. We interpreted this stage as an 'As-if Real realm', in which imagined futures take on a temporary seriousness due to situational urgency, consistent with Augustine et al.'s (2019) notion of 'as-if reality', where imagined futures gain concreteness through iterative engagement and are treated as real. These interpretations are also inspired by Aciman's (2021) *Homo Irrealis* essays, which resonate with Emirbayer & Mische's (1998) emphasis on the temporality of agency – past experience, present constraint, and future possibility – in sensing uncertain futures.

Iteration 3: Identifying Activities, Challenges and Competing Mechanisms

We then compared events and activities in the three realms identifying different challenges and competing mechanisms in each stage. Critical events marked the transition from one realm to another (Figure 7: lightning flashes and virus symbol).



Respectively an 'internal' change from cycles of probe-sense-respond to sense-analyse-respond (Kurtz & Snowden, 2003) and COVID-19 as an 'external' cosmologic event (de Rond et al., 2019; Weick, 1993).

Probing cycles in the irreal realm evolved as intended exploring themes such as non-mobility, AI-driven or stewardship-motivated mobility, but analytical cycles in the real realm were surprising as the intention was to take developed probes on a journey across the organisation. The second surprise emerged from COVID-19 restrictions which folded previously – in the irreal realm – considered future time onto the present. This reinvigorated probing cycles. We identified how these different activity cycles constituted different challenges in each realm and labelled them *entering the zone of discomfort* in the irreal realm, *connecting lived experience* in the real realm, and *rehearsing with the trouble* in the as-if real realm.

The deviant analytical cycle, which we had not expected to find given the methodological context of probing futures rather than anticipating or foreseeing, triggered us to further analyse the relationship between activities and challenges. Vignette writing (Langley & Abdallah, 2011) allowed us to unpack some of the underlying dynamics of competing mechanisms within the realms. Vignettes were written for analytical purposes, yet some are included in the results section because they effectively demonstrate dynamics in the irreal realm. We identified *stretching* and *self-censoring* in the zone of discomfort as the mechanisms that enabled and prevented value conversations around probes during probe development. *Embracing* and *dodging* mechanisms occurred when connecting lived experience. Embracing was scarce while dodging signified the frontrunners struggle with how to proceed. We identified mechanisms of *adapting* and *mere surviving* while rehearsing with the trouble, in this case 'non-mobility' as induced by COVID-19 restrictions. Adapting refers to experimenting with a transformative mindset, while mere surviving indicates a mindset of returning to the old 'normal' after the pandemic. Most remarkable in this analytical step was the deviant analytical cycle and the dodging prevailing over embracing in the real realm which induced our next analytical step.

Iteration 4: Analysing realms of future-making and revealing threatening pull-to-order forces

We further analysed the activities and events to unpack how competing mechanisms were influenced within the realms by *pull-to-order* forces (Figure 8: thunderbolts). Additionally, we revealed the deviant analytical cycle in the real realm as a pull to order in itself. The concept of organisational pull-to-order – forces

sustaining stability and control (Uhl-Bien & Arena, 2017) – allowed us to analyse the dynamics within and across realms from a relational perspective rather than a cognitive incapacity.

Within the realms, we analysed how different pull-to-order forces threatened the various challenges. In the unreal realm, a *lack of shared suspense of disbelief* arose from frontrunners anticipating fellow civil servants' lack of leniency for stretching. In the real realm, a *lack of shared sense of urgency* stemmed from frontrunners outsourcing probe development and sensing, thereby disconnecting probing from organisational future-making practices. In the as-if real realm, a *lack of shared sense of criticality* emerged as experimenting employees approached these with a different mindset than the frontrunners.

Across realms, we analysed the switch in the frontrunners' practices from probing cycles – probe-sense-respond – to analytical cycles – sense-analyse-respond. This terminology, originating in sense-making and knowledge management literature (Kurtz & Snowden, 2003; Snowden, 2002), distinguishes probing as appropriate practice for complex challenges, such as the transformation of the mobility system in our case, from analysing as appropriate for structured challenges. We interpreted the frontrunners' activities in the real realm as analytical cycles, not probing. This view is supported by the unsuccessful attempts to turn probing insights into guiding directives for civil servants' future-making practices, rather than using the probes to generate compelling energy.

We then applied counterfactual reasoning (Mair & Seelos, 2021) to compare hypothetical probing cycles – i.e., what would have likely happened when continuing probing – with realised analytical cycles to better understand the dodging of values conversations. We contextualised our interpretations by zooming out to other practices the frontrunners were engaged in (Jarzabkowski, Bednarek, et al., 2019; Nicolini, 2012). Scrutinising archival documents and field notes, we found clues that the frontrunners' written ambition to enable adaptive space between innovation and operation was not common practice yet, nor fully endorsed by the higher management. This led us to interpret the frontrunners' change of practice as a 'pull-to-order trap' (Uhl-Bien & Arena, 2017, 2018). From this perspective, we could explain how the frontrunners' anticipation of expected negative civil servants' responses to the 'unfamiliar' probes led to a change in practice from probing cycles to analytical cycles which turned out unsuccessful.

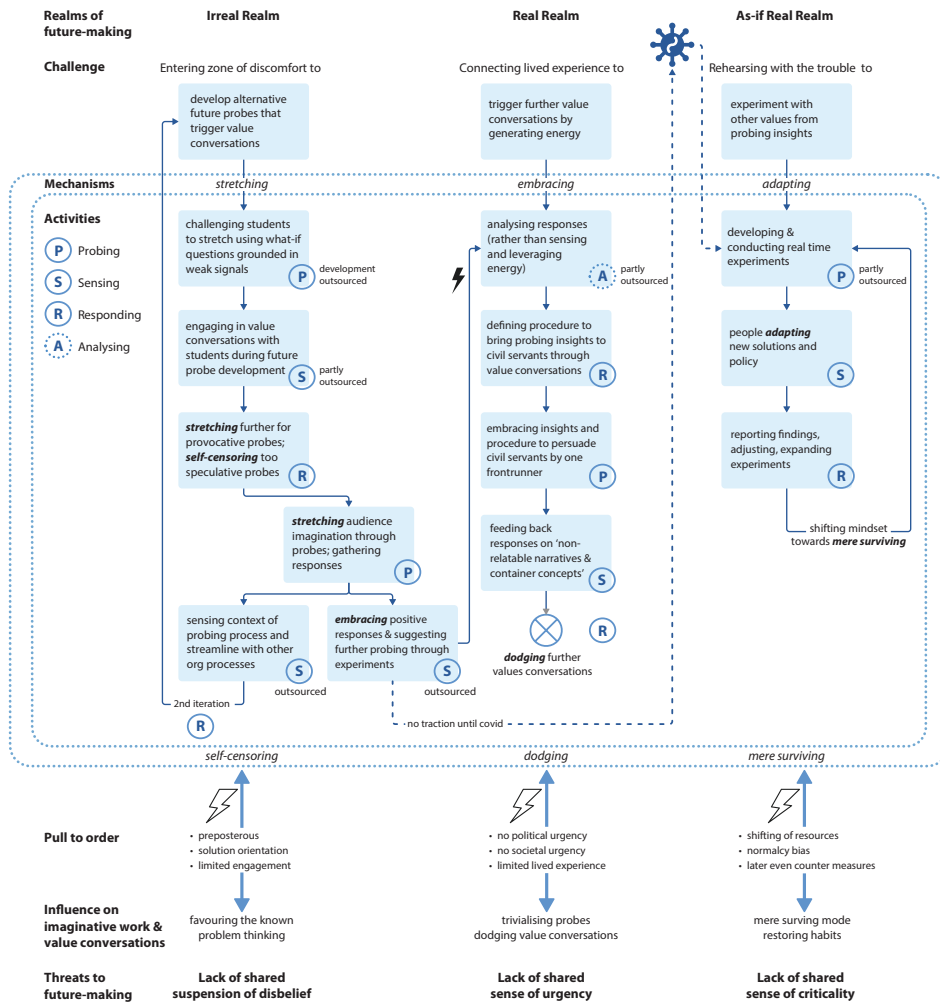


Figure 8 - Visualisation of concepts

Iteration 5: Synthesising and Theorising our Empirical Model

Finally, we connected the conceptual elements of our analysis (Figure 8) and theorised our empirical model (Figure 9) of the challenges in imaginative work and values conversations. Each realm represents a distinct yet interrelated engagement with future-making practices. The Irreal Realm fosters imaginative exploration challenging organisational future-making, the Real Realm constrains these explorations within organisational contexts or even ignores them, and the As-if Real Realm brings these futures into temporarily actionable focus under pressing conditions. Together, this framework illuminates how actors engage with future-making as an integrated experience, often wrestling with the pull of situational realities and evolving institutional constraints that can lead to the avoidance of value conversations.

We came to interpret what happened in the 'As-if Real Realm' as a successful consequentiality of the first future probing iteration in an 'Irreal Realm'. Here the probing cycles in the irreal realm served as exaptive practices (Garud et al., 2018) that gained traction in the 'As-if Real Realm' during the pandemic restrictions.

3.4 Findings

In this section, we present our findings from the case of probing futures of mobility by frontrunners at PublicOrg. Using Figure 8 as a narrative structure, we demonstrate how activities in three realms – irreal, real and as-if real – constituted distinct challenges, activating varied mechanisms to initiate a dialectical process for transforming institutionalised beliefs and values. This transformation was facilitated through engagement in imaginative work related to alternative futures-triggered values conversations. Take notice of the exceptional positioning of the probing exhibitions on the border of the irreal and the real realm in Figure 8. Our analysis of the data reveals how the exhibitions were on their way to serving a bridge function between irreal and real realms but failed to fulfil this function. Even more so, this failure coincided with a switch in practice from probing to analytical cycles ending in deadlock. We further highlight how imaginative work was affected by various kinds of pull-to-order reversing the intended mechanisms and hampering values conversations thereby limiting the successful initiation of a dialectical process for transforming institutionalised beliefs and values.

The key parties involved in initiating the practice of probing futures were a group of frontrunners from PublicOrg, two partnering external advisors who had suggested

engaging in probing futures and connected them to the university, and the students supported by education and research staff. Others, such as operational civil servants, exhibition visitors and experimenters during the pandemic, are not our focal actors and will enter the findings narrative mainly from the frontrunners' perspective. Quotes have been translated, paraphrased and anonymised for reasons of non-retraceability.

3.4.1 The Irreal Realm: Entering the Zone of Discomfort

The challenge in the irreal realm was *entering the zone of discomfort* which was induced by the front runners' desire to grasp the meaning of gathered weak signals of change in society. These weak signals were used to invite a group of creative university students to develop future probes that would inspire imagination and conversation about the 'other' value worlds disclosed and about assumptions rooted in institutionalised beliefs and values. Driven by curiosity, the frontrunners entered the zone of discomfort with an open mindset or as one frontrunner tended to say to the students "*Thanks for confusing me*" (P1#2). Here we demonstrate how probing cycles constituted the challenge of *entering the zone of discomfort* and triggers mechanisms of *stretching* and *self-censoring* in the irreal realm. We also provide two illustrative vignettes of both mechanisms in imaginative work and values conversations during probe development. We close the irreal realm by reflecting on how the *lack of a shared sense of suspension of disbelief* was induced by relational pull-to-order forces and how it impacts imaginative work and values conversations in the irreal realm.

The zone of discomfort was opened during probe development as well as during probing exhibitions to experience and discuss probing ideas and probes. Creative students invited the frontrunners and others in for a dialogue on future probing ideas that would effectively concretise and render conceivable unprecedented future worlds. For instance, the idea of integral mobility advice based on social, health or sustainable values instead of the usual cost, comfort and time was eventually displayed as a ticket machine. Visualisations of probing ideas triggered values conversations between students and citizens in the street, and between the frontrunners and students during probe development, while experiential, tangible probes and evocative posters triggered values conversations during exhibitions (probe). Stretching the imagination towards unconventional alternative futures brought about feelings of discomfort, nicely wrapped up by a student reflecting on the two-day bootcamp "*We need to let go of things we find comfortable and enjoyable*" (P1#4) (sense). Similarly, at the exhibitions for a broader audience probes generated values conversations triggered by wonder – e.g., about the use of biometrics in

traffic – or resistance – e.g., anything involving governmental restrictions –, yet the energy during the exhibitions dampened afterwards (sense). No visible immediate responses in the irreal realm occurred, but surprising responses are part of the real and as-if real realms.

During probe development, probing ideas that were considered too familiar encouraged further ‘stretching sideways’ using analogies or recombining ideas as illustrated in Vignette 4. Conversely, highly speculative futures (Vignette 2) induced *self-censoring* among participants. Stretching imagination sideways produced genuinely alternative futures while self-censoring produced rather conventional futures (respond). Hence, the challenge of entering the zone of discomfort was threatened by a *lack of shared suspension of disbelief* as exposed below.

Competing mechanisms: Stretching versus Self-Censoring

In the irreal realm, stretching imagination on the future of mobility was supported by a process consisting of three stages: 1) translation of the weak signals into provocative questions, 2) developing future probes contextualised with possible future world views, and 3) gathering insights through values conversations around probes and probing ideas. These stages were roughly the same in the two probing iterations, although the students’ participation in the second stage varied as described in Box 1. The second iteration took place mainly online due to pandemic restrictions. This introduced limitations to the probing practice that are beyond the scope of this research.

The three stages in the irreal realm comprise the characteristic part of the practice of probing futures that aims to pressure the system with alternative possibilities to generate emergence. Box 1 gives insight into the activities and varying participants across the three stages of future probing in the irreal realm. These activities aim to stretch people’s imagination towards the unthinkable with a particular role for the participating students.

Box 1 – A Narrative Account of the Probing Stages in the Irreal Realm

In the initial stage, diverse and thought-provoking questions were formulated to inspire creativity and explore new ideas. These ‘what-if’ questions, based on weak signals in society, aimed to break from linear thinking and consider various possibilities. With the help of an external advisor and university staff, over 60 signals were condensed into 10 provocative questions during two facilitated sessions with around 15 frontrunners. The university staff’s goal was to create actionable

questions and briefs for student collaboration. For instance, signals were clustered into themes like ‘public scepticism towards science’, ‘cybersecurity in public spaces’, ‘the gap between sustainable intentions and actions’, and ‘logistics of printed food’ (P1#2). This led to questions like ‘What if travel became unnecessary or forbidden?’, ‘What if citizen science guided mobility decisions?’, and ‘What if mobility is rented from future generations?’ (P1#2). These questions were contextualised by weak signal observations to make abstract inquiries more meaningful and to trigger imagination.

In the second stage, future probes were developed through a collaborative co-design process. This involved exploring and transforming probing ideas into sketches, mock-ups, and tangible artefacts to stretch the imagination. Creative students played a crucial role in this phase, contributing valuable perspectives and skills. The first offline iteration began with a two-day bootcamp at the organisation's innovation facilitation centre, involving 30 co-design students and three frontrunners immersed in future probing practices. This was followed by a four-week intensive minor program held in a hybrid education and professional design studio environment, allowing participants to break away from day-to-day structures and foster creativity. The outcome of this phase included the creation of four future probes and ten visual posters, with input from workshops involving frontrunners, research, and education staff. Professional artists and designers collaborated with students to produce ‘exhibition-worthy’ probes, such as tangible artefacts and evocative posters, in the pre-pandemic iteration. In the second online iteration, approximately 25 students participated in a 20-week ‘future lab’ course, mainly working from home with occasional access to a maker space. This resulted in the development of four distinct future worlds – Ecotopia, Smartopia, Localtopia, and Sociotopia – each featuring innovative probes (P2#4), which were digitally mediated and discussed online. University staff facilitated this probe development phase by guiding students through visual storytelling and world-building techniques, using disruptive drivers and trends grounded in reality and highly speculative elements to inspire imaginative futures. Creative students enrolled in communication and co-design courses played a pivotal role in stretching the imagination of frontrunners involved in future probing. Five frontrunners had regular contact with the student teams, despite some ad hoc limitations in their availability. Intermittent co-design sessions were open to interested others from PublicOrg and the university staff.

The third stage aimed to attract a wider audience to engage with the future probes and the associated value worlds. In the first iteration, a physical exhibition took place at PublicOrg, with frontrunners responsible for attracting an organisational audience. Free drinks were offered at the end of the exhibition on Friday afternoon.

University staff invited an educational audience and helped students prepare the exhibition. Four experiential probes, including a VR impression of future office buildings, were displayed for tangible experience, while others were presented through visualised posters. Students shared insights and initial citizen responses, encouraging visitors to move between exhibits, partake in values conversations and respond through cards prompting surprise reflections and suggestions for PublicOrg. Stretching occurred as visitors responded contradicting to probe suggestions. For instance, someone was okay with municipal restrictions on mobility for the public interest, while another visitor fiercely opposed interference, and a third visitor suggested that doing nothing might be the better option as congestion would ultimately resolve once the streets were clogged with cars (P1#6). The stretching here is mainly sideways exploring other directions, yet triggered by deep stretching exploring a possible world with limited transport availability distributed by means of a connected 'Holowatch'.

In the second iteration, during the pandemic, students showcased their digitally visualised probes – though some entailed pictures or video of 3D artefacts – during an online meet-up. A broader audience was invited to discuss and respond through interactive collaboration software. For instance, students presented their ideas about 'energy as currency which is transferred through a handshake in a world where local communities are self-sufficient'. The frontrunners and other audiences were challenged to further stretch their imagination by prompting questions such as "What is inspiring and energising?", "What additional questions does it trigger?" and "Why would you be willing or not to travel to this world soon?" which were gathered online and discussed in groups (P2#4).

An example of how conversations around probes triggered stretching deep and sideways in the irreal realm during probe development is elicited in Vignette 4. It illustrates how interactions between the students and frontrunners enabled them to stretch their imaginations as far as possible. Yet, it also offers insight into how easy conversations may run into evaluative practice treating a probe as a solution to known problems rather than using their inquisitive capacity as a research object.

Vignette 4 – Stretching from ‘Booking a spot on the road’

The frontrunners challenge one student team with the question “What if no further new (rail)roads are built?” (P1.2). The students explore the analogy of air traffic control and come up with the idea of a globally connected AI-driven traffic system, including space for possible novel modes of transportation in the future. Similar to booking a seat ticket in an aeroplane, they envision travellers booking an empty spot to use roads, rails or other infrastructure. The system would offer travellers optimised itineraries when booking a spot.

Initially, at the two-day bootcamp, the frontrunners easily link the booking-a-spot idea to an ongoing political discussion about road use triggering questions like, when will people accept such restrictions and what are obstacles to implementation? But it is also combined with other ideas already heard, triggering questions like, how to deal with emergency traffic? To them an ambulance evidently had priority, but who or what else deserves priority? Would the concept evoke trade in ‘road use rights’? Who would benefit and at what cost? A direction they explore is holographic meet-ups as alternatives to travelling, in case the booked spot is not available after all. This enables them to have a conversation about travel priorities. From citizens’ responses, the students infer that holiday travels are the first to be sacrificed if travel opportunities become scarce.

Later, as the students have more time to elaborate, the emergency aspect conjures up a more alternative future imagination. Maybe caretakers would not need much priority in the future if the AI-driven traffic system is expanded to health monitoring and preventive interventions. The mobility question (reducing road usage) has been reframed into a health issue (novel healthcare and prevention practices). The team quickly sketches cyborg-like wearables and medical drone assistance, which starts taking on a life of its own.

Confronting citizens with their preliminary probes, students discover that citizens are less threatened by medical drone assistance as an extension of a general practitioner than by medical robot replacement.

The vignette shows how students initially stretch sideways by analogies to explore possible solutions to what would be a linear future if we started redistributing existing (rail) roads. This invoked sideways yet still linear stretching in conversations with the frontrunners connecting the idea to current issues. But later the students apply systems thinking by imagining an intervention in the health care system to affect the mobility system stretching imagination further sideways – another

systems pathway – and deep – possible future AI developments. In this case, the simple fact that the educational course took longer than the two-day bootcamp was beneficial to further stretching. The students were challenged by educational staff to always stretch further and combined with the excitement and desire of being confronted with something truly surprising, it enabled the students to unpack the implications of the ‘Booking a spot on the road’ probe and the world it disclosed. The initial idea thus triggered further imaginative work exploring not only in the same direction as the initial probe – reducing road usage – but also in other directions – mobile health practices. Though not immediately seized by frontrunners, these viewpoints offered opportunities to adopt a more systemic view of the mobility system drawing less obvious disciplines into the discussion. Opening up such systemic viewpoints brings previously inconceivable possibilities into reach.

Not all probing ideas made it to the exhibition as some ideas were considered hardly inventive and others were considered too speculative already during development. Though the frontrunners spurred the students to surprise them, occasionally we witnessed them dismissing probing ideas suggested by the students without discussing its implications. *“The students approached us as experts, but we challenged the students to reach beyond our knowledge. That is why we asked them these what-if questions. Not because we know about it, but because we are interested to learn about it”* (P2#5). Paradoxically, the frontrunners pulled the students back when genuinely speculating beyond their knowledge triggering the self-censoring mechanism in the unreal realm.

The ‘dream station’ in Vignette 5 is such an example. The vignette shows how frontrunners classify the idea as preposterous and guide the students in other directions resulting in a probe at the exhibition that is hardly inventive.

Vignette 5 – Self-censoring from ‘Dream station’

During a meet-up, a student team presents a highly speculative probing idea of applying neuron stimulation to replace all travelling with ‘virtual travel experiences’ (P1.3). The idea was inspired by envisioning a future world in which permanent floodings induced citizens to retreat to small self-sufficient communities above the water level. Being mostly isolated due to the water and having researched that the freedom to go places is dear to humans, they envision a dream station for each community – sketched as an idyllic pavilion full of robotic butterflies that stimulate the brain causing a dreamscape experience. The students explained that, like lucid dreams, all experiences would be indistinguishable from real experiences. The difference is that one has control over the direction the dream takes. The students report both positive and negative citizens’ responses to the possibilities that dreamscape travelling unlocked, displaying confidence that their speculative idea will trigger valuable discussions.

The frontrunners, however, immediately dismiss further development of the probe idea without discussing its implications. They simply state that they do not want to pursue such far-fetched directions. When a student tries to defend their probe grounding its credibility in state-of-the-art technology research on neuro-stimulation, they are not interested. Instead, the frontrunners stimulate the student team to further explore VR in office work prompting them with questions along the lines of “What would an office building look like if it no longer provided individual working spaces?” (P1.3). The students struggle with these directions for a while as the educational staff challenges them again to stretch their imaginations. Under time pressure, they ultimately stick to the frontrunners’ prompts. Receiving rather last-minute support from a creative VR professional, they end up developing a VR experience that gives an artistic impression of the office as a social meeting place. The audience compares it to existing shared office buildings in which often entrepreneurs take office and meet others.

In this case, the students are puzzled by contradicting directions from the educational staff and the frontrunners. A confluence of events, such as sensing the tension between plausibility and possibility, time pressure and regarding the frontrunners as clients, presents them with a trade-off that culminates in literally complying with the suggestion.

Lack of a Shared Sense of Suspension of Disbelief

The probing practices induced an energetic inspirational environment that triggered the frontrunners' curiosity most of the time. The enthusiasm and creativity of the students contributed to this energetic atmosphere. During sparring sessions in which visually presented probing ideas triggered stretching, values conversations between frontrunners and students emerged as described in Vignette 4. Contrarily, the vignette also reveals the drawbacks of a solution-oriented mindset. Pulling towards such more probable futures undermines the shared sense of suspension of disbelief the frontrunners and students established in the irreal realm. Even more so, Vignette 5 shows the persistent threat of *lack of shared suspension of disbelief* due to the paradoxical mechanism of self-censoring. The dream station in Vignette 5 is considered highly speculative because the novelty it introduces is not yet widely spread or accepted technology and its application is an unfamiliar impression of the mobility domain.

Interestingly, although the frontrunners challenged the students to surprise them, they dismissed the highly speculative probing idea referring to their intention of confronting other civil servants in the organisation with the probes to spark values conversations. They expected civil servants not to take such preposterous probes seriously, and perhaps they did not either. As students saw the frontrunners as clients, they acted on what they heard as client's needs. They lacked the confidence to challenge them more strongly. As a consequence, genuinely different non-linear future value worlds were avoided to generate values conversations already in the irreal realm. This example demonstrates how at times the ambition of surprising probes was pulled back towards more probable futures due to considering organisational order responses. We considered it undesirable for comprehending or instigating deep transformative change.

3.4.2 The Real Realm: Connecting Lived Experience

The challenge the frontrunners faced in the real realm was *connecting lived experience* of probing with lived experience of organisational future-making practices. This challenge emerged as the frontrunners changed their practice to tackle the challenge, after the two future probing iterations that opened up irreal realms for imaginative work and values conversations. Instead of continuing cycles of probing, they started analysing in the real realm (Figure 8). While probing cycles attempt to generate emergence and create energy that can be leveraged, analytical cycles start by sensing something problematic, analysing it for diagnosis and then planning a response (Kurtz & Snowden, 2003). In our case, the original idea had been to continue probing by taking the probes on a journey throughout

PublicOrg. “*Deliver us ten probes under the Christmas tree*”, was joked by the managing frontrunner. The number of tangible probes was quickly scaled down to four and ten visualised on posters, but more importantly, circumstances – a lack of storage facility and COVID-19 measurements – prevented physical encounters from happening. The online iteration only produced digital presentations unsuitable for a journey. The following change of practice from probing to analysing and a lack of political and societal urgency hindered connecting probing insights with organisational future-making and political or societal agendas. The comprehensible but unfortunate change from probing to analysing instigated a series of events in the real realm that ended in a dead end.

Below we demonstrate how the change to analytical cycles constituted the challenge of *connecting lived experience*. Analytical cycles induced the mechanism of *dodging* while attempts to restore probing cycles also triggered *embracing* to a limited extent. We close the real realm by reflecting on how the *lack of shared sense of urgency* originated from pull-to-order forces and hampered the emergence of values conversations and imaginative work in the real realm.

The energy created in the irreal realm quickly dampened after the exhibitions (sense). The frontrunners became aware of the challenge of *connecting lived experience* of probing with lived experience of organisational future-making and struggled with how to proceed. They tried to tackle the challenge by asking both the university and the external advisors to perform analyses of the probing practice’s outcomes to grasp their implications (analyse). After these analyses, two more events were undertaken to instigate probing-related values conversations (respond). The first was a workshop with a group of frontrunners, partly involved in the probing practices partly new, to explore how to proceed from probing insights to provocative values conversations with strategic civil servants in the organisation. The workshop was facilitated by the two external advisors whose activities during the workshop we interpreted as trying to restore probe-sense-respond cycles with limited success. It resulted in an agreed ‘process’ to be tried (the probe). The frontrunners identify criteria for conducting values conversations that create urgency for alternative future possibilities. As summarised by one facilitator: “*I hear the word urgency is a crucial factor in setting things in motion.*” The second event was the try-out of applying the process in pilot conversations conducted by a volunteering frontrunner (probe). The frontrunner discussed the experience with the advisors (sense) who fed back the insights in writing with no further observable follow-up action (respond).

Competing mechanisms: Dodging versus Embracing

Though the frontrunners desired to expand values conversations around probes disclosing 'other' value worlds as triggered by probing cycles in the irreal realm, in the real realm such values conversations were dodged. We saw three kinds of dodging mechanisms hampering values conversations. First, the frontrunners dodged probing practices. Second, the frontrunners dodged building vertical relationships with management. Third, they also refrained from forming horizontal relationships with colleague civil servants. Hereafter, we will demonstrate how these three kinds of dodging hamper values conversations.

Dodging Probing Practices. In line with common practice, the frontrunners had outsourced probing alternative futures to a large extent to students which had pros in the irreal realm – e.g., creativity, energy, inspiration – but cons in the real realm. It triggered a desire to connect what had happened in the irreal realm with ongoing organisational future-making, causing the frontrunners to change practice from probing to analysis. Below we will demonstrate how this dodging of the probing practice was an inappropriate move. Analysis was then outsourced as well, leaving the frontrunners with limited lived experience of probing. Due to a lack of ownership of events and processes in the irreal realm, it is not surprising that a dodging mechanism hindered conversations about values.

The shift towards analysis constituted a change of practice that we recognised as an order trap (Uhl-Bien & Arena, 2017) indicating a pull towards a habitual approach that does not fit the complexity of the challenge. As described above, analytical cycles comprised consecutive activities of sensing, analysing and responding (see also Figure 8). While probing cycles generate emergence intuitively, analytical cycles unfolded a knowledge-heavy approach that implied truth claims based on future probing practice. Claims, that the frontrunners distrusted as they were based on student work. Simultaneously, this reveals a linear perception of the future and a predictive approach that is contrary to how future probing works. Future probes were never intended to predict probable futures which might justify truth claims, but to explore possibilities. In the irreal realm probes had been appreciated for their inspirational value generating energetic values conversations, but in the real realm, the frontrunners inappropriately approached the future by analysis to explain to others novel knowledge from probing.

The shift to analysing emerged as the frontrunners sensed that the energy of the irreal realms was lost after the students finished their participation. During evaluations the frontrunners expressed their struggle: "*[The student material] is rich*

in context and narrative. How do we extract central insights that are usable separate from the probing trajectory?" (P2#5). Upon request, a slide deck was provided with analytical reflections highlighting probe-related findings next to visuals and descriptions of the probes and the process. The frontrunners then consulted the partnering external advisors to analyse the insights thematically and extract themes relevant to PublicOrg. Through these analyses, the frontrunners hoped to get *"[...] some kind of guiding principles that we can use to persuade others, similar to the UK.gov principles, but more specific"* (personal communication). This remark indicates a desire to assist others by imparting knowledge they do not yet possess, rather than involving them in the discovery process. This is in contrast to probing practices that generate emergence through action rather than instruction. It is noteworthy that the task of familiarising with the data was performed by others on both occasions.

Outsourcing the analysis on top of being an inappropriate approach given the situation has contributed to invoking the dodging mechanism. Outsourcing is common practice for the frontrunners as shown in the following quote during the evaluation of the cooperation: *"My colleagues and I have engaged in six to seven conversations with the students [in this iteration] ... which is more than we have done with any other contractor. You have received... that is not the right word... we have put a lot of effort into this endeavour"* (P2#5). The lead frontrunner confirmed a larger demand than they initially anticipated. Although they spent the extra time to support the students in delivering relevant future probes in the irreal realm, it is arguable whether that was enough to grasp the intricacies and richness of the student work as the above quote about their struggle elicits. Falling back on their common practice of outsourcing in the real realm further increased the knowledge gap which reduced the confidence of the frontrunners to challenge civil servants with insights from future probing. Here we have shown how a double pull towards common practice – analysing and outsourcing – reinforced dodging due to limited lived experience of probing.

Dodging Horizontal Relationships with Colleague Civil Servants. We noticed dodging to build horizontal relationships first when during the exhibition of the first iteration the amount of university visitors outnumbered organisational visitors. Knowing that research and education staff had invested in attracting an audience, they were a bit disappointed that civil servants were lacking. Though the exhibition generated some values conversations, visitors felt little incentive to act themselves. They were more likely to suggest that government institutions in general should be taking action (respondcards). The online character of the second 'exhibition'

imposed many restrictions that have been well documented by Whyte et al. (2022) and will not be further addressed in this chapter. However, we take notice of the online experience probably contributing to the frontrunners' mixed feelings of disappointment and uncertainty, which may have contributed in this stage to dodging mechanisms. Afterwards, we picked up signals of frontrunners trivialising the student work as 'tinkerware' (e.g., int#8). Others appeased such responses as 'not invented here' syndrome and compared it with negative responses to citizen-initiated projects (e.g., int#17).

Dodging also surfaced during the workshop 'From Probing to Provocative Conversations' as the frontrunners encountered difficulties connecting the themes and insights from future probing to specific actors in strategic areas. Due to these difficulties, they dodged engaging others in values conversations from probing practice. There was a poignant silence when the frontrunners were asked to step forward to represent one of the issues and to identify who should be involved in a conversation about it. When personally invited, one of them said: *"With whom not? Since nobody is picking it up, we are picking it up. Bit of an open question, this"* (M#5). Others confirmed this when they started listing the relevant departments beginning with obvious ones and broadening the scope mentioning more fine-grained programmes and even a specialised COVID team. The facilitator responded to this by affirming the complexity of their job and suggested that the narrative they would develop in due course might need finetuning towards these different target groups. The struggle to do so manifested when one frontrunner pointed to the relevance of most of the themes for the aviation department working on drones as a service:

"[...] the challenge for me [is] when I introduce the theme of shared mobility to aviation they think: What should I do with that? And I understand that [...] the art is precisely [...] [w]here are the cross-links where you should find each other from a bigger picture of data-driven mobility, shared mobility or being climate-neutral or otherwise" (M#5). The frontrunner thus materialised the trouble of linking general future themes and insights to the specifics of drones as a service thereby justifying his reluctance to step forward.

The dodging resulted from limited lived experience of probing and limited lived experience of organisational future-making concerns. Limited lived probing experience due to outsourcing combined with the move to analysing for knowledge-based truth claims induced uncertainty about the probing practice's

analytical outcomes. Though most remained quiet, one frontrunner instilled that the thematic insights were not yet specific enough while leaving efforts to make it more specific to others. For instance, the managing frontrunner provided an example of linking circularity insights to a disputed project aimed at expanding a highway to alleviate traffic while destroying a forest to enable it. Another frontrunner pointed out to expect discussion about the accuracy of the probing. Towards the end of the workshop, the frontrunner reified the double uncertainty about the accuracy of findings and current future-making to be an obstacle to taking responsibility for the probing outcomes. *"I think there is an asymmetrical relationship between someone who knows the old regime better than me and myself, who pretends to have seen something of the future but lacks that background. This puzzles me. I can sell it until someone says, 'Sorry, but this is nonsense'."* (M#6). The quote reveals uncertainty from a lack of lived experience of probing – using words like ‘pretend’ and treating the future predictively as a ‘truth to be sold’. Simultaneously, the quote elicits uncertainty from a lack of lived experience of the concerns in current future-making, which is referred to as ‘lacking that background’.

Dodging Vertical Relationships with Management. After the pre-pandemic exhibition, the frontrunners asked the external advisors, who had introduced them to future probing and the cooperating university, to interpret the outcomes of future probing practices so far, and to advise on how to continue. The advisors suggested concrete experiments based on the probing insights to further explore emerged themes, but the frontrunners were unsuccessful in mobilising management support. Dodging to invest in the relationship with higher management, even though with understandable reasons, can be a show stopper. The uncertainty about the probing practice’s analytical outcomes played a role here, but perhaps even more significant was the lack of vertical alignment of probing activities with higher management in which budgetary cycles and procedures ended up defining the playing field.

Exemplary was the timing of future probing practices with the students which asked for alignment between their educational programme and organisational budgetary cycles and regulations. Within certain budgetary limits, there was freedom to operate as the frontrunners ought necessary to fulfil their assignment, such as probing futures with students. Yet, for further probing experiments they needed to gain support from higher management. The execution of concrete probing experiments derived from an outsourced swift analysis of the first probing iteration was not endorsed by management. The experiments, suggested by the external advisors, aimed to bring insights from probed alternative futures into present action

through continued probing cycles. According to the external advisors misaligned budgetary cycles and timing of the probing experiments were not helpful in this respect, which is why they crafted a process chart to align processes. This prompted a second iteration of probing with students but since managerial support was not timely mobilised, the frontrunners initially decided to put the experiments on hold, until the unforeseen pandemic situation catalysed such initiatives.

The entanglement of management support and budgeting cycles was familiar to frontrunners who often felt tossed back and forth between managerial ambitions and lack of support. As one frontrunner explained when referring to managerial ambitions expressed through organisational communication channels:

“There's a lot of great stuff there, but how to follow up on it? Practice what you preach. [...] There are several aspects to this. It has to do with the prevailing culture. [This culture refers to] how people and departments are organised, the structure of our financial system, and who is hired where. What is the top-down approach and how are budgets allocated? This is done on dossiers and departmental basis instead of an overarching view” (int#17). Another frontrunner expressed how the frontrunners regularly got caught between innovation, operational departments and politics. “Four years ago, we were working on tube transportation. Two years ago, a move was made in parliament to include it in the high-speed rail strategy. They simply park it with us again and we go back to work like crazy because otherwise, it won't happen. But then we should say: no, it's yours now. That isn't easy. I could cite five more examples.” (M#5).

One of the results of evaluating the first iteration was a process chart drawn up by the external advisors, that aligned internal budgetary processes with a yearly cycle of picking up weak signals, concretising them (with students) and having results translated into probing experiments. A positive result was the immediate start of the second future probing iteration, but more tedious was the lack of follow-up on the first iteration. There was no traction on the suggested probing experiments until pandemic measures caused the probed non-mobility futures to become reality (see as-if real realm).

Notwithstanding the emphasis on dodging, we also witnessed the mechanism of embracing during the workshop ‘From Probing to Provocative Conversations’ in the real realm. During the workshop facilitators tried to restore probing-sensing-responding cycles although the future probes developed by the students remained

out of sight. They facilitated the participants to develop a probe to engage civil servants in provocative conversations. The probe consisted of a procedure to approach civil servants appropriately to engage them in conversations and a practical application content-wise of connecting specific actors to a specific theme. Because of the dodging, the latter was not fully achieved and required some extra investment afterwards. Sensing was planned during the try-out and a follow-up response would emerge, indicating that no action was a valid response as well. First, however, the facilitators needed to trigger a mechanism of *embracing* to develop the probe together. Embracing here means re-adopting probing as a practice rather than analysing and postponing judgments about the future probing insights they had put together as input for developing content and a process to try out – to probe.

Embracing surfaced as one frontrunner, who had only been part of the online 'exhibition' in the second probing iteration, gradually grasped the probing practice as a way of future-making and suggested piloting a round of values conversations based on the probing insights. This frontrunner, whom we introduce as Sam (pseudonym) for reading clarity, embraced the uncertainty surrounding the probing insights and the emphasis on 'doing probing' rather than analysing. Sam is the one responding to the other frontrunners' scepticism about the accuracy of the student work *"It is nonsense until proven otherwise. What matters is how you approach a colleague. Instead of bringing a new truth, engage the person to pioneer together"* (M#5).

Being half-time committed to a strategic policymaking programme, Sam gives notice of understanding the concerns on the operational side, for instance, that "[civil servants] do see the interesting novel stuff but are unable to fit them into their assignment" (M#5) or that such novelty does not solve their current problems but need a broader systemic viewpoint to see their relevance. "Novelty often represents future possibilities for doing things smarter or simpler. They may not immediately solve the CO2 or climate problem" (M#5). Interestingly, Sam ended up being the only one taking ownership during the workshop showing "empathic capacity for what the other needs in business as usual" which an external advisor indicated as a prerequisite for "meeting them" (M#5). Where others merely vent what hinders them from making connections between probing insights and actors operating in strategic areas, Sam can "label meeting topics with the themes from probing insights" (M#5).

Next to embracing probing insights, it is essential to know and embrace the concerns of conversational actors to make a connection along the relational line. To illustrate how such embracing works, Sam explains:

"I seek overarching themes for our contributions, adopting a different [systemic] perspective. I am unsure why certain topics consistently arise in meetings while others do not. However, these topics provide me with useful entry points to latch my tentacles onto. A bicycle contributes to health, so I won't position it under sustainable mobility but under public health. This is because the currently responsible administrator is closely linked to cycling, but soon there will be one who wants nothing to do with it. That's how I handle that aspect now, and I find it interesting. I believe it's a form of internal marketing—network influencing to convey these topics effectively..." (M#5).

The quote reveals how knowing someone's background is effectively used to advocate specific future-related insights. Forging this vertical bond enables operational actors to act with hierarchical support.

Lack of a shared sense of urgency

The events in the real realm evoke a *lack of shared sense of urgency* among frontrunners and operational civil servants. Urgency, in this context, pertains to content, signifying the imperative need for immediate action or resolution. A shared sense of urgency involves relational dimensions, capturing the collective sentiments and convictions that a matter necessitates attention. While the pandemic restrictions presented an opportunity to leverage specific insights on non-mobility (as observed in the as-if real realm), there was a notable absence of subsequent efforts in the real realms without such a cosmologic event. Before the pandemic, urgency of further dealing with discovered future possibilities and insights was not omnipresent and thus required deliberate effort to be created. Although the frontrunners felt a sense of urgency to invest in compelling themes, they faced difficulties in engaging others as described above. Without explicitly stating it, the frontrunners dwelt on the inadequacy of content to make connections, but the workshop facilitators tried to leverage build relationships to alleviate this.

Within the workshop, frontrunners recognised the pivotal role of creating urgency in bridging probing activities with value discussions among civil servants. Some frontrunners consistently expressed the probing content's deficiencies to persuade

civil servants “*It is important to indicate the consequences of inaction, including worst-case and best-case scenarios to create urgency.*” (M#5). The facilitators, on the other hand, underscored the importance of relational aspects in generating urgency, emphasising “*Sometimes, when people are stuck and looking for a way out, they seize every opportunity regardless of its origin to overcome their struggles. This involves identifying a connection with someone who has a goal in mind, and how they can make that goal work in conjunction with an insight given here. Does this thought resonate better?*” (M#5). Criteria for translating probing insights into values conversations surfaced swiftly, supporting the notion that frontrunners possessed a clear understanding of the necessary actions. Yet, their hesitance to engage with the task suggests a lack of lived experience in the probing domain and an insufficient grasp of civil servants' concerns, hindering the establishment of meaningful connections. Unsurprisingly, this reluctance to forge connections aligns with the observation that both the development of probes and the sense-making of probing insights were largely outsourced, and the frontrunners were relatively distanced from ownership of present concerns.

3.4.3 The As-if Real Realm: Rehearsing with the trouble

The challenge in the as-if real realm concerned *rehearsing with the trouble* triggered by the COVID-19 pandemic between the first and second probing iterations. The pandemic proved a catalyst for creating an as-if real realm as the frontrunners recognised the situation as the non-mobility futures explored in the irreal realm of the first iteration. They acted promptly and began experimenting. While the irreal realm's non-mobility was induced by provocative what-if questions suggesting governmental restrictions or a redundancy to travel due to other options or restrictions applied to specific areas like business or tourist travel, the pandemic-induced non-mobility entailed all of those. The ‘trouble’ was here to be dealt with, even though in the beginning most people saw the pandemic as a relatively short period to be bridged.

The challenge of *rehearsing with the trouble* refers to the degree of concreteness of emerging issues, their interdependence and immediate impact. In the irreal realm, responses were more hypothetical and often singled out an underlying assumption (e.g., specific resistance to governmentally imposed restrictions). In the as-if real realm, responses were real, interwoven with multiple underlying reasons to act or not which were applied more pragmatically. For instance, most citizens initially complied with governmental restrictions without questioning but later some citizens rebelled against imposed restrictions for various reasons. Also, new rules and regulations reflecting new value orders – who is allowed to travel or has priority

over others – varied over time as new problems arose. Exemplary was the closing of schools as hotspots of infection, and their reopening when the consequences for children became evident. In the office environment of PublicOrg, exemptions were granted to employees whose well-being suffered from working at home.

Below we demonstrate how frontrunners, with a transformative mindset, engaged in probing and experimentation to *rehearse the trouble*. By doing so, they triggered *adapting* to new and uncertain situations at PublicOrg. Occasionally, a mechanism of *mere surviving* surfaced. The latter is important to understand our reflections on pull-to-order forces that trigger a *lack of shared sense of criticality* restricting values conversations and imaginative work to the current situation in the as-if real realm rather than aiming for lasting transformation.

The frontrunners set up experiments with themselves as test subjects, with the purpose of “[...] *exploring a new way of working after lifting COVID-19 restrictions [... with the aim ...] to contribute to preventing unnecessary and less sustainable transport movements at peak times when the mobility system is under pressure [... and ...] hoping to set an example as [frontrunners] for PublicOrg and a large part of Dutch office workers.*” (archival documents). Through explorative experiments, they aim to achieve specific goals, such as decreasing their personal transportation footprint and avoiding mobility peak times. Most probing involves remote working in which they focus on new practices and behaviour, working conditions and to a lesser degree terms of employment. For instance, they tested online collaboration tools and later hybrid team meetings with new ‘netiquette’ that addressed the missed chitchat and serendipitous moments (probing). The frontrunners kept a log sharing personal experiences and during regular online team meetings, they collected responses and reflections on participants’ experiences (sensing). At the end of the seven-month pilot, they analysed their findings, reported their learnings and gave practical recommendations. Concluding that the continued measurements offered ample opportunity for further experimenting, they submitted the working hub experiment to an internal subsidy challenge and won. Investing in a dedicated project manager for this experiment and a general project manager to programme further activities propelled the continuation (responding).

Competing mechanisms: Adapting versus Mere Surviving

The pandemic experiments provided ample opportunities to explore and rehearse new practices of online and later hybrid working. As a cohesive group of enthusiast test subjects, the frontrunners acted swiftly and voluntarily, which enabled them to bend procedures and rules that would normally have hampered progress. For

instance, participants voluntarily submitted their home addresses to tinker with technical possibilities for a mapping application to calculate the optimal location for collaboration between participants at cycling distance. The frontrunners won an internal challenge with this idea of regional working hubs, leading to an assigned project manager for determining criteria and developing a real-time pilot experiment. Similarly, some frontrunners assisted other departments to adapt with hybrid team approaches. One of them shared *"They decided to reverse it: when you come into the office, you are surrounded by colleagues who are taking calls. The office is a meeting place."* (M#4). This quote shows how teams adapted to new situations such as having video calls while others tried to concentrate.

The frontrunners distinguished themselves from others through their proactive 'doing' approach to creating active engagement. *"[G]roups have emerged from operational management and staff departments to think about how to shape hybrid work. The frontrunner group also addressed issues from within the content of the primary process and actively engaged in experimentation."* (int#7). Reflecting on their activities to involve others, the expanded team later also recognised the value of active engagement during workshops and their own *"playing, searching, testing and taking a deep dive"* (M#4). Or as one of them proudly expressed: *"[S]ome of you I have never seen face to face and yet it was a successful project. We ourselves are proof that even 100% virtual is possible."* (M#4).

Making vertical and horizontal connections within PublicOrg contributed to gaining traction for experimenting. Vertical connections were beneficial in agenda setting and were harnessed when the interim report from the frontrunners was presented to the board. Teaming up with ICT and HR staff enabled the frontrunners to link real-time adaptive behaviour to internal business operation, which in turn contributed to its adoption as a strategic instrument to achieve future mobility goals. *"We made the connection with the formal programme of hybrid working"* (int#7). To them, hybrid working was the next stage in increasing flexibility of working at PublicOrg. As the frontrunners were positioned within the primary process, they also linked hybrid working to PublicOrg's objectives, such as reducing emissions and congestion in the mobility system. This message was integrated in campaigns to promote and practice hybrid working at PublicOrg, particularly during the online. It was part of the online, hybrid and occasionally physical workshops and discussions that the team organised to stimulate debate and provide practical support to managers and staff during the pandemic. The combination of personal experiences with integrating a new work approach into regular practice and monitoring effects on attaining future objectives proved beneficial to adopt hybrid

working as a policy instrument. As one frontrunner explains: *"We have never had such a clear demonstration that slight active steering on this issue can bring political goals a step closer."* (int#8).

The frontrunners began experimenting among themselves with a post-pandemic transformative mindset, but their attempts to spread such an embracing attitude to others revealed the mechanism of *mere surviving*. While surviving was literally at stake during the pandemic, this mechanism challenged the transformative mindset of actors involved, hence mere surviving.

Mere surviving suggests that actors engage in new practices with the idea that these pandemic-induced practices will pass and everything will return back to normal. For instance, reflecting on the first round of activities one of the organisers shared being surprised that someone had asked, notably being involved in aligning further programming, whether *"hybrid working was here to stay?"* (M#1). Another organiser observed that the question seemed to evolve from associating hybrid work with the pandemic, looking backwards rather than forwards. *"We need to explore whether we can break this association and create new associations in its place."* (M#2). This had already been the reason for one of them to decouple dossiers visually on the intranet.

The present focus of the reshuffled team's activities after the interim report unintentionally reinforced the link between hybrid working and pandemic circumstances. Led by a new project manager the team decided to capitalise on the energy of winning the internal challenge. They organised festival-like activities – hybrid, online, offline – to engage others in debate and started campaigning (online) to invite employees to workshops, talks and discussions. They invited leaders and professionals to share ideas in traditional – e.g., management speakers – and creative – e.g., involving actors – ways to stimulate discussion across the organisation. The varying pandemic restrictions have influenced the way activities could take place — this improvisational approach to organising strengthened associations between activities and circumstances. *"We now work 100% virtually again and require the hybrid setting to experiment further. So we depend on time to continue."* (M#4) indicating their intention to continue feeding forward learning experiences. The pandemic restrictions created conditions to gain lived experience with previously considered future practices entailing other value orderings. However, perceiving the pandemic as a temporary condition impeded the permanent acceptance of alternative values.

Lack of Shared Sense of Criticality

One of the strong points that instigated adapting during the pandemic is its present focus, but this also elicited a lack of a sense of criticality for long term effects. As the virus focused attention to current physical health, the experiments focused on accommodating remote working to reduce chances of infection. Additionally, the experiments drew attention to current mental and social wellbeing which had been one of the insights from the unreal realm's future probing. Simple probes like organising 5 minutes of social talk at the start of a meeting felt odd at first, but were also much appreciated. For instance, it gave managers a chance to read the signals of 'the trouble' actors experienced and to contact them individually. The risk of this focus on present issues was that actors, including frontrunners, occasionally forgot why they advocated hybrid working in the first place. Recognising themselves getting caught in the order trap of habitual thinking, such as admitting to the habit to have 9 to 5 trainings on location or silently judging a colleague leaving at 3 pm, the group knew that it would take rehearsal time to accept hybrid working as the new normal. They acknowledged that such learning moments also required some self-compassion.

3.5 Empirical Model: Challenges in Imaginative Work and Values Conversations

Building on our exploration of future probing practices employed by frontrunners within a public organisation to envision non-linear alternative futures and challenge institutionalised values and beliefs, we developed an empirical model that illustrates the diverse challenges encountered across three distinct realms: the Unreal Realm, the Real Realm and the As-if Real Realm (Figure 9). Our model underscores how these realms are shaped by opposing mechanisms as frontrunners engage in imaginative work and values conversations, aiming to induce 'opportunity tensions' within the organisational system to generate emergence (Lichtenstein, 2014). This approach contrasts with merely striving for a shared vision or goal, emphasising openness to unforeseen outcomes rather than pursuing broad, yet predetermined objectives (Pettit et al., 2023; Rindova & Martins, 2021; Sharma et al., 2022).

Drawing upon principles of emergence, such as creating significant difference within a system (Eoyang, 2001, 2007) and fostering creative tension fuelled by passion and motivation (Lichtenstein, 2014), our model also illuminates the challenges arising from persistent pull-to-order forces. These forces often lead to the avoidance of values conversations, thereby restricting imaginative engagement

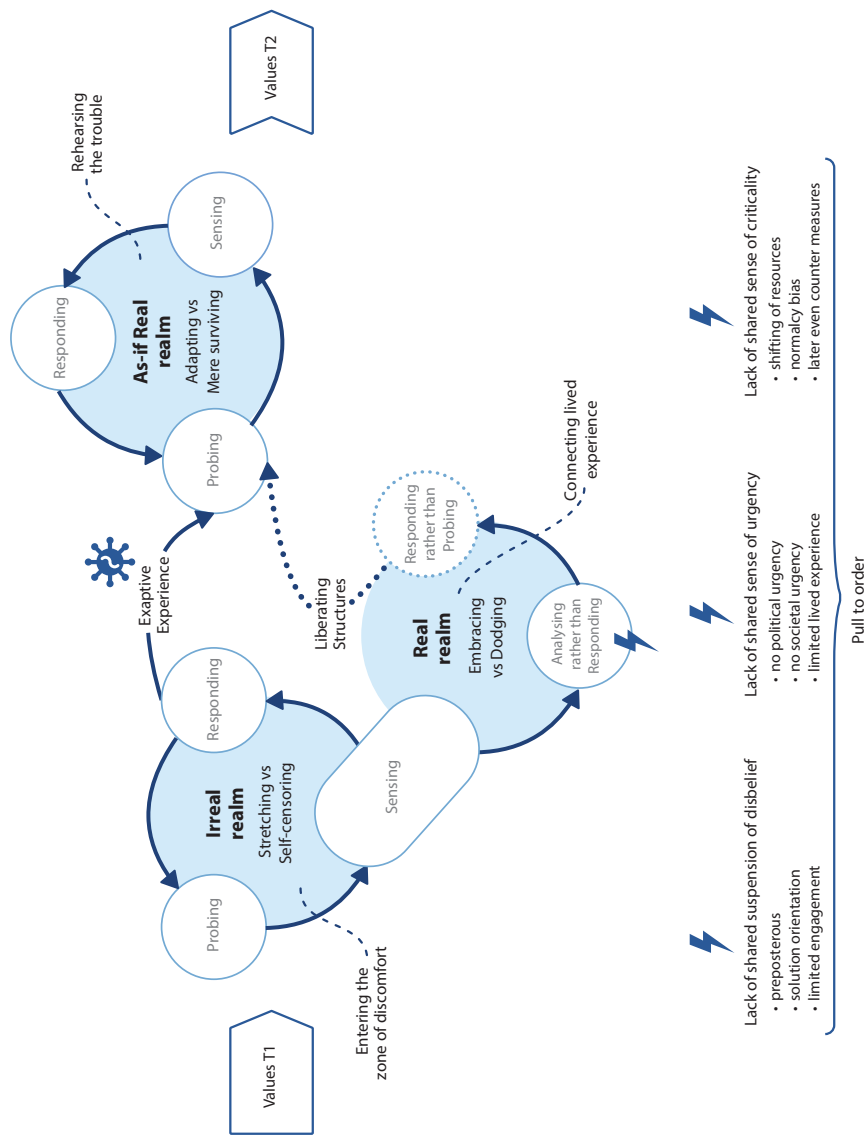


Figure 9 - Empirical model of challenges across three realms of future-making

– an aspect that has been overlooked by future-making scholars. Challenges within the realms arose from opposing desired and undesired mechanisms, which together created a generative opportunity tension that offers new ways of seeing and potential alternative pathways into the future. Our data revealed that while these tensions provided opportunities for exploration beyond previously unconsidered possibilities, they were not fully embraced due to socio-material structures that limited engagement. This made the process vulnerable to the pull-to-order forces (indicated by flashes in Figure 9) that sought to restore stability and conformity. Our findings indicate that maintaining momentum is particularly challenging when transitioning from the *irreal* realm to the *real* realm, where the temptation to revert to familiar analytical practices can stifle creativity and exacerbate deadlock.

In our case, this deadlock was alleviated when the COVID-19 pandemic imposed ‘liberating disciplines’ (Torbert, 1998, p.233) – structures that negated the limiting conditions set by the frontrunners’ analytical practices and restored probing practices as they engaged in real-time experimenting. This shift is represented by the dashed arrow in Figure 9. While liberating structures are typically introduced through managerial intervention, in this instance, the pandemic restrictions effectively collapsed previously imagined alternative futures onto the immediate reality. This rendered the pandemic period a unique exaptive experience for testing and adapting previously conceived ideas, analogous to Garud et al. (2018), who apply the concept of exaptation to scientific discoveries and advocate for exaptive practices that maintain, activate, and contextualise them for later use.

3.5.1 Interplay Between Imaginative Work and Values Conversations Across Three Realms

Through probing futures, the frontrunners aimed to initiate a dialectical process within their organisation to open up entrenched beliefs and values guiding future-making practices in the mobility domain (Figure 9: Values T1 and T2). To facilitate this, several provocative probes were delivered by the students to spark intended values conversations. However, adopting the practice of probing futures involved challenges, including the frontrunners reverting to familiar analytical practices and unforeseen circumstances like the pandemic, which altered the course of the process. Initially, the frontrunners engaged in dynamic values conversations while developing ‘exhibition-worthy’ future probes in the *irreal* realm. However, reverting from probing to analytical practice in the *real* realm led to dodging values conversation, despite a desire to connect probing insights with operational departments. This impasse was alleviated when the pandemic opened an as-if real realm, allowing values conversations to link with lived experiences. Below, we

elaborate on how we interpret specific competing cognitive mechanisms form our observations and how relational dynamics influence this interplay.

3.5.2 Dynamics in the Irreal Realm

The 'irreal realm', as an environment or container that holds the actors engaged in probing futures and the alternative worlds disclosed by the future probes, sparked values conversations and stretched imagination. Value conversation between frontrunners and students included relaying students' preliminary discussions with citizens and experts about their probing ideas. This realm embodies a complex interplay of present agency with past experience and future expectations (Emirbayer & Mische, 1998). Inspired by the work of Augustine et al. (2019) on distant futures gaining as-if reality and Aciman's (2021) concept of 'Homo Irrealis', we see future probes opening the irreal realm, evoking various irreal moods – dislocated senses of time brought forth by desire" (Banks, 2021, p.5). This reframes time as a liminal space, allowing for disruption of the temporal and spatial constraints that typically inhibit engagement, expanding into conscious awareness and fostering potentially transformative discussions.

Probes need to be provocative to inspire imaginative dialogue, as the atmosphere during probe development must be energetic to facilitate information flow among participants. As Boltanski & Thévenot (2006) note, in an inspired world, actors value creativity, ingenuity or the bizarre while routine, habit and conformity are evaluated as unworthy. The students, viewed as valuable contributors, fostered enthusiasm and a shared suspension of disbelief that enables exploration of unconventional futures. Such suspension of disbelief is necessary for enduring the psychological anxiety produced by engaging with novel ideas or knowledge and challenging assumptions and beliefs (Griffin et al., 1999; Hirsh et al., 2012). This can always lead to dismissing probing ideas as too speculative. An occurrence in our case concerns a highly speculative dream station (see Vignette 5 for a description) that the frontrunners dismissed without exploring its meaning for values conversations.

From a cognitive perspective, we witnessed 'stretching sideways' as frontrunners engaged in imaginative work to turn weak signals of change picked up in society into provocative what-if questions. Such what-if questions encompassed unfamiliar ways of thinking about mobility, for instance non-mobility or AI-governed mobility, and triggered the development of future probes, or artefacts from the future, in cooperation with creative students. By adding the adjective 'sideways' to the common concept of stretching (Deken et al., 2016) we express the need for stretching to alternative pathways into the future rather than stretching temporally

deep (Augustine et al., 2019; Grimes & Vogus, 2021). During the probe development process, conversations focused on the potential disclosure of alternative worlds with unconventional values systems (Hovorka & Peter, 2021). Frontrunners and students explored alternative values informing mobility decisions, such as healthy or social mobility. This explored a future where limited road usage prompted participants to share their biometrical data on shock reactions to guide cyclists through dense urban areas. During development, unconventional ideas were subject to scrutiny to ascertain their potential for disclosing 'other' values. Vignet 1 illuminates how such iterative processes evolved, showing stretching sideways and highlighting the value of the students' creative skills.

From a relational perspective, the values conversations between frontrunners and students were influenced by a pull to order due to their entanglement in other practices and relations. The frontrunners brought to the floor their perceptions of how others would respond to specific probes, prompting them to dismiss probing ideas that they conceived as too speculative. The students applied practical knowledge from previously acquired experience in educational assignments involving client-contractor relationships, leading them to conform. Neither of them was aware of the consequences. Dismissal elicited a lack of suspension of disbelief that, not properly addressed, resulted in self-censorship. As a result, stretching to 'other' value constellations that challenged current ones faced limitations. We perceived this as a missed opportunity for effective values conversations. To explain, we saw frontrunners dismissing probes that they found 'preposterous' (Voros, 2019). Such probes were believed unconvincing to others as they did not offer attainable solutions. Students were then advised to go in other directions, intentionally keeping vague as to what problems or goals probes needed to be geared. Students then tended toward more probable near-future possibilities. We regarded such critical events in the unreal realm as pull to order because they point to a sort of *self-censorship* resulting from an unequal power relation between students and frontrunners. This self-censorship pulled imagination in the real realm back to more probable futures losing their capability of disclosing genuinely alternative values constellations that trigger more transformative values conversations.

3.5.3 Dynamics in the Real Realm

In our conceptualisation, the 'real realm' revolved around trying to connect alternative future probes and insights to ongoing future-making practices by triggering and expanding values conversations beyond the frontrunners participating in the unreal realm. In other words, the future probes and 'other' worlds they represented faced reality. While we saw that the unreal realm was

mainly governed by inspirational value, emerging values conversations around alternative future imaginations in the real realm faced the multiple value orders that constitute everyday reality. As such, they resembled sites of moral multiplexity that organisations face in front of their audience to gain moral legitimacy (Reinecke et al., 2017). We argue, that during values conversations, imagined alternative futures similarly fight for legitimacy. Not legitimacy for implementation, but for credibility and being taken seriously through dialectical processes (Augustine et al., 2019). To serve their purpose in the real realm, future probes need to spark ongoing values conversations.

We observed values conversations staged in three ways, first, by exhibiting the future probes in a discursive experiential setting, second, through online exhibitions during COVID-19 and third, by discussing abstracted and thematised insights during work meetings. The (online) exhibitions are presented in the findings section under the unreal realm, because they actually draw visitors into the unreal realm opened up by the probes as intended. Yet, we theorise them as part of the real realm, because they illuminate how the probing practice ideally treats the future as the present. Although this could arguably be called an as-if real realm, the lack of follow up in our empirics to engage in sustained probing experiments enables us to explain the relational aspects involved in moving from the unreal to the real realm. Hence, theoretically we consider the exhibitions as-if real realms as a relational space between the unreal and real realms, but empirically we explain their faltering due to a lack of building strong relationship to prepare 'soft landings'. Conversations during work meetings covered insights decoupled from the designed probes after the frontrunners had changed from probing to analytical practices.

During (online) exhibitions, probes functioned as inquisitive objects giving access to unprecedented value-laden 'other' worlds (Hovorka & Peter, 2021), which had performative value by triggering non-rational visceral responses that called for reflective practice to make sense of its meaning (Schön, 1992b, 1992a). For instance, one visitor at the exhibition reported being moved by the poster concept of 'calling your great-great-grandchildren to learn about the consequences of your mobility choices' which triggered her to recall to the overview effect that astronauts often have when first viewing the blue marble we live on. She envisioned further tangible development of the probe to possibly instigate a paradigm shift. This empirical example shows how future probes facilitate both reflecting on current future-making practices to possibly let go of and feeding forward alternative value worlds to be scrutinised for their desirability. This seemed to work best during the physical exhibition, to a lesser extent during the online presentations and not at all when

discussing abstracted and thematised insights decoupled from the tangible probes during work meetings.

In both iterations, after the (online) exhibitions, we observed how the student work was trivialised resulting in *dodging* further values conversations. Dodging refers to a failure to involve others in values conversations as derived from attempts after this workshop. The frontrunners asked involved external advisors how to proceed. The advisors clustered probing insights into relevant themes and suggested a list of concrete near-future experiments to probe further. The frontrunners did not find support to start experimenting. After the second iteration's online exhibit, we noticed how frontrunners started questioning the probes 'accuracy' and dismissing them as naïve students' work particularly during a workshop discussing how to expand from probing to engaging others in dialogue or values conversations. This time the advisors facilitated a workshop to explore with the frontrunners how to use probing insights and near-future experiments to expand values conversations across the organisation without further exposing the probes themselves. The online probes lacked the shared experiential practice of the tangible ones (Whyte et al., 2022). During the workshop, the participants established a mode of operation and guidelines for conducting tantalising values conversations of which one was crafting stories that aligned abstracted probing insights with core issues in civil servants' daily practice. Among the participating frontrunners, we observed reluctance to proceed until one frontrunner committed to engaging in a pilot round. The main conclusions from these attempts to attract others into values conversations were, that the abstractions were non-relatable for civil servants and a profound lack of time to start experimenting. Consequently, further attempts at values conversations were dodged.

From a cognitive perspective, the probes seemed to do their job, triggering values conversations and reflections, which were particularly in the physical setting induced by initial affective responses of the visitors. This temporary *embracing* of the probing ideas as if they were reality to give sense to their implications for present action only lasted until the exhibition was finished, hence during active facilitation. We did not witness further amplification of the energy that temporally emerged around the probes at the physical exhibition and to a lesser extent at the online exhibition. In line with Whyte et al. (2022) we reason that eliminating the physical probe experience in online settings reduced the richness of building shared experiential knowledge. During online exhibitions, students presented their probes online and reflections from 'visitors' remained rather abstract. Deep engagement with and interpretation of the implications of other values worlds

disclosed by the probes for present actions suffered from *dodging*. More profound analysis of the probing outcomes to elicit their implications was outsourced. This implies that the frontrunners never engaged deeply to make sense of the probing insights and implications, which minimised their lived experience with the probing material. Dodging deep engagement in values conversations was also reported by one of the frontrunners who felt confident enough to take 'decoupled' insights in a narrative approach to the operational civil servants to pilot the 'provocative conversations' approach. The frontrunners had formulated this approach under the guidance of external advisors involved in the probing practice. The piloting frontrunner fed back, that civil servants working in specific programmes could not relate to abstract container concepts such as sharing economy, even though they might be involved in projects on bike or car sharing. This example suggests, that stretching siloed thinking – bounded by the focus of a particular project or approach – requires more specific relatable content and possibly lived experience with the probes and associated value worlds. However, given the 'preposterous' ideas suggested by the probing insights that challenge current ways of working and interacting with the world, we theorise that relating cognitively along the unsettling content of such probes requires strong relational conditions.

From a relational perspective, we see a *lack of shared sense of urgency* to hamper expanding values conversations. A sense of urgency relies primarily on lived experience that enables someone to make connections between events or actors in a system. For instance, in our case the frontrunner who had strong relationships with specific programmes was able to craft narratives that connected abstract themes such as the sharing economy to concrete examples such as bike or car sharing. Why those addressed found it difficult to connect is beyond the scope of this research, but it might involve the decoupling with concrete experiences through probes and the narratives being too abstract. When one misses valuable insights from lived experience, either from the probing practice or from daily practice, it is difficult to recognise and leverage probing insights. Lived experience, on both sides, benefits connecting probing insights and organisational future-making practices. This goes beyond communicable rational knowledge insights from probing or the issues at play in ongoing mundane future-making practices in the organisation. It also entails embodied practical knowledge that contributes to how the future is brought into being (Thompson & Byrne, 2022). In our case, the imaginative work was mainly performed by the students, while the advisors elicited insights and made sense of the implications. Consequently, the frontrunners barely owned the detailed practical knowledge developed by probing futures. On the other side, most frontrunners lacked lived experience of the core issues at

play in civil servants' daily future-making practices. When prompted, frontrunners knew which thematic probing insights were relevant to which departments, but they approached them from a spectator's third-person perspective (Reason & Torbert, 2001). The issues were not theirs to own, which involves reflecting from a first-person perspective, yet this was outsourced. The frontrunners also lacked the second-person perspective of civil servants who did own the issues at least to some extent but had the assignment to innovate the future-making practices. A commitment of those civil servants depends largely on political or societal urgency for which the case made during provocative conversations was not strong enough. That changed when the COVID-19 pandemic kicked in.

3.5.4 Dynamics in the As-if Real Realm

The 'as-if real realm' emerged as the COVID-19 pandemic triggered the frontrunners to start experimenting loosely based on ideas developed in the unreal realm during the first iteration. As-if real refers to Augustine et al.'s (2019) conception that distant future imaginaries gain as-if reality when they become more concrete through a dialectical process. Their case on geoengineering reveals how an initially academic idea gains traction on a societal level through thesis, antithesis and synthesis. While theirs is a process of decades, our conceptualisation of the pandemic as an as-if real realm shares the characteristic that as-if reality emerges as previously inconceivable futures gain concreteness. The pandemic measures folded previously conceived future time – i.e., non-mobility futures – onto the concrete present.

Cognitively, the resemblance between pandemic conditions and previously imagined future worlds was recognised by the different parties involved in the practice of probing futures. They immediately reconnected and due to 'crisis' conditions, the frontrunners felt mandated to start experimenting, which are in fact relational aspects showing how cognition and relationality are entangled. We interpreted these probing experiments as *rehearsing with the trouble* in which non-mobility reconfiguring value orders and requiring adaptation was the trouble. The emerging conditions proved valuable for exploring what would work in previously imagined future non-mobility worlds. This required translating alternative future ideas into feasible experiments, but with a long-term transformative mindset. For instance, ideas about local hubs as connection points in traffic inspired an open-door policy at interconnected public organisations across the country. This way employees who lived close to each other could easily meet up near home to the extent meeting was eventually allowed during the pandemic. Getting used to such practices over time was believed to grow into habitual practice that remained after the pandemic conditions would be alleviated. The frontrunners monitored

and evaluated the obstacles and opportunities such experiments disclosed. While the team held its transformative mindset, most activities focused on support for employees *adapting* to the pandemic situation. Possibly due to this strong link to the pandemic some employees maintained a pattern of *mere surviving*, which was difficult for the frontrunners to decouple.

From a relational perspective, the probing experiments proved successful attractors to engage more and more employees and means to continue on a broader scale. The frontrunners team joined forces with employees from the HR departments which enabled them to embed the probing experiments into organisation-wide campaign-like activities. This communicative approach helped to get people involved and promoted to rethink habitual ways of working by offering alternatives and guidelines to facilitate team conversations. Prolonged empathising among actors suffering the same restrictions and enduring the same ‘trouble’ rendered their effect on remote working very successful. Even to the extent that countermeasures were taken to invite employees back on the work floor when restrictions were alleviated. Although the team had tried to decouple remote working from the pandemic conditions, such countermeasures spread by management proved that this was not entirely successful. The criticality displayed by the team about which actions would benefit permanent change of employees’ mobility practices could not withstand management practices.

To summarise our theorising, we saw competing cognitive mechanisms constitute the typical challenges central in each realm (circles in Figure 9) and pull-to-order challenges (thunderbolts in Figure 9) signal flaws in relational aspects. Alertness to such signals and attending the underlying relational aspects is beneficial to conducting values conversations and triggering imaginative work that stretches sideways to genuinely alternative futures. While theorising from our findings shows how the unreal realm functions in exaptive experience building, we discuss in the next section in more detail the role of the unreal realm in overcoming the lack of imagination. Furthermore, we suggest establishing an as-if real realm as a rehearsal stage, similar to how the pandemic conditions created structures to rehearse the trouble. To establish this line of thinking, we first envision the practice of probing futures as a distinct way of future-making that, unlike teleological shared-vision approaches, is able to navigate complexity in an emergent non-teleological manner. As such its driving force is not building consensus or appreciating common ground, but perturbing routines that are taken for granted.

3.6 Discussion

This study aimed to better understand the role of imagining alternative futures and values conversations in changing institutionalised beliefs and values that drive future-making practices in established organisations. We took a practice perspective on future-making to study how a group of frontrunners in a public organisation invested in imaginative work – through probing futures – to generate the emergence and possible amplification of ‘transformative values conversations’ throughout their organisation. We considered probing-induced values conversations transformative because they challenge current value and belief systems by showing alternative future possibilities. The frontrunners aimed to instigate transformative change of institutionalised beliefs and values that drive current future-making practices through probe-sense-respond cycles. We found the frontrunners engaging in imaginative work across three realms of future-making – irreal, real, as-if real realms – each with its challenges to induce values conversations. While intended probe-sense-respond cycles supported helpful cognitive mechanisms of *stretching* in the irreal realm and *adapting* in the as-if real realm, we found pull-to-order forces reversing these mechanisms. A *lack of shared suspension of disbelief* triggered a *self-censoring* mechanism and a *lack of shared sense of criticality* triggered a mechanism of *mere surviving*. Even more surprisingly, in the real realm pull-to-order forces, surfacing as a *lack of shared urgency*, pulled the frontrunners into the order trap of engaging in an analytical cycle rather than continuing probing. Consequently, their attempts to connect alternative future imaginations to organisational future-making practices faltered. We developed an empirical model (Figure 9) exploring these challenges of linking alternative future imaginations to everyday future-making practices through transformative values conversations.

These findings show how the practice of probing futures profoundly differs from teleological approaches to achieve preferred visions (Pettit et al., 2023; Rindova & Martins, 2021; Sharma et al., 2022) in their role of imagination and way of dealing with complexity in grand challenges. We contend that teleological approaches reduce complexity through goal-directed behaviour which is a causation model of decision-making – selecting means to an end (Sarasvathy, 2001). Instead, the probing approach engages the complexity by explicitly generating trouble within the system through the introduction of unsettling alternative future possibilities, which aligns with an effectuation model of decision-making – creating various ends through recombining means (Sarasvathy, 2001). Findings also suggests that attending to relationality is important to find synergies among parties necessary

to make things work, in our case particularly the frontrunners, management and operational civil servants. The pull-to-order we found is exemplary for a lack of synergy rooted in issues with relating unprecedented alternative futures with existing practices cognitively along content-lines. Whereas other highlighted the importance of plausibility to support others' cognitive alignment, we suggest *empathic interrelating* to prepare 'soft landings' and build strong supportive relationships for enduring the discomfort associated with unconventional, less plausible, yet still possible and even 'preposterous' alternative futures (Gümüşay & Reinecke, 2024; Voros, 2019).

In the remainder of this section, we explicate our theoretical contributions, explain implications for organising transformative change for grand challenges, suggest practical implications, discuss the boundary conditions of our theorisation and give directions for further research.

3.6.1 Theoretical Contributions

With this study, we make three contributions to the literature on future-making. First, we distinguish how a probing perspective to future-making differs from teleological approaches of shared vision development and highlight its challenges specifically to probing alternative futures. Our extended model (Figure 10) suggests three distinct yet connected realms of probing to navigate the challenges involved and resist organisational pull-to-order forces. Second, our research confirms the lack of imagination but also suggests an 'Irreal Realm' to overcoming the lack of imagination. Third, we suggest establishing an 'As-if Real Realm' to resolve the deadlock due to the trap of using inappropriate practices in the 'Real Realm'.

A Probing Perspective to Future-making

Scholars have challenged the perspective that organisations can effectively control the future and suggest studying future-making from a practice perspective (Wenzel et al., 2020). Recent theoretical and empirical models have highlighted that future-making finds a middle ground between creative imagination and productive constraints (Pettit et al., 2023; Rindova & Martins, 2022). As organisational boundaries tend to reinforce constraints that benefit futures they can resource (Beckert, 2021) that lack deep transformative change on a systems level (Loorbach, 2022), we see a need for established organisations to start approaching the future in a way that challenges such constraints and encourages debate about desirable futures (Gümüşay & Reinecke, 2022). An important part of these constraints is invoked by a lack of imagination that prevents actors from seeing genuinely alternative possibilities (Hajer & Versteeg, 2019). Such possibilistic thinking (Grimes

& Vogus, 2021) is induced by the practice of probing futures under study but it does not automatically lead to transformative action as seen in our research. Yet, the practice of probing futures we studied was designed to generate the emergence of transformative values conversations which are intricately linked to imaginative work that gives access to unprecedented future value worlds (Hovorka & Peter, 2021). Our research offers a better understanding of this future-making practice by emphasising the role of alternative future imaginations-induced values conversations to instigate change in institutionalised values and beliefs that drive organisational future-making practices.

Prior approaches to future-making have suggested moving forward into the future by reaching some kind of consensus about a vision to move towards (Kantabutra, 2020; Logue & Grimes, 2022; Stam et al., 2014). Such approaches often treat the future in a future-perfect tense resulting in teleological pathways reaching such a future through incremental steps (Kornberger & Clegg, 2011; Sharma et al., 2022). Teleological approaches rely on causation (Sarasvathy, 2001) as a way to move forward implying that the goal is clear and actors need to select the means to achieve it. To illustrate, 'co-creating forward' uses future imagination to determine a desirable future, then backcast potential pathways and use nudging practices to keep actors aligned to come up with compatible solutions (Sharma et al., 2022). As such, causation approaches are helpful once future goals are more or less clear and agreed on and the means to achieve them exist. This makes them appropriate for navigating probable conventional futures and structured challenges, such as 'prolonging the battery life of electric vehicles' or 'stimulating electric driving'. They are however inappropriate for 'listening to' non-linear alternative futures whose potentials may cast a different perspective on current goals, as they may co-emerge in various unknown and unknowable directions (Brand, 2019). In short, it matters what is imagined.

Future probing suggests another way to move forward into the future in line with effectuation (Sarasvathy, 2001) and generating emergence (Lichtenstein, 2014). Effectuation-based approaches work with the means available while figuring out along the way in what direction it is moving. Such approaches use the future to become aware of less obvious available means, in other words, to make sense of signals that can be leveraged to invoke disruptive change. Future probing explores non-linear alternative futures by folding imagined futures onto the present for inquiry from within the system dynamics. For instance, exploring what a non-mobility future would look like or an AI-governed mobility system frees one from the assumptions around familiar concepts embedded in defined shared goals by

suggesting not yet-defined novel concepts. In doing so, it creates conditions for the emergence of novelty. Emergence in social systems or organisations depends on three conditions – container, difference and exchange (Eoyang, 2001, 2007). We have seen these conditions met in the irreal realm where probes opened a psychologically safe space for stretching one's imagination and bringing unrealised potentials into present inquiry. The probing practice functioned as a container that contained frontrunners, students and research and education staff cooperating to develop probes, while the exhibitions expanded the container to include the audience. The imagined unorthodox alternative future probes created significant differences with probable, conventional futures to induce the exchange of information when they triggered transformative values conversations. We also saw these conditions in the as-if real realm when the COVID-19 restrictions pressured the mobility system creating significant differences with previous practices, inducing exchange when people started rethinking what they valued most, and the frontrunners opened a container holding those involved in the experiments to adapt to the situation while striving for long-term transformative change. We suggest future probing as a distinct methodological approach to future-making that comes with its specific challenges as highlighted by our study.

At first glance probing cycles may not seem different from other cyclic models of future-making (e.g., Pettit et al., 2023), yet the probing perspective on future-making we present, differs in two interrelated ways. First, probing emphasises imaginative work beyond orthodox social imaginaries (Dey & Mason, 2018) which relates it to changes in value systems and moral choices as a driver of changing organisational logic of action (Rindova & Martins, 2023). Second, probing is not teleologically organised as it aims to maintain probe-sense-respond cycles exploring the possible rather than prematurely settling on a shared vision that can be achieved through structured means.

The imaginative work in the practice of probing futures resembles to a certain extent a co-creating forward process (Sharma et al., 2022) in which an imagined future serves as temporary incomplete vision of future possibilities whose inquiry involves future perfect thinking (Fuglsang & Mattsson, 2011; Gioia et al., 2002; Pitsis et al., 2003). However, the starting point is different. The future probes in our case did not represent “end point[s that] can serve as a mile marker, a possible future from where researchers and managers can identify actions today to get to that future” (Sharma et al., 2022, p.354). Probes did not aim to represent a desirable future but a possible one, as illustrated by the contested ideas about government-imposed travel restrictions which became reality during the pandemic. Instead,

they served as research objects to prefigure the diverse directions of how current actions may flesh out over time and discuss their desirability in terms of values and moral framings (Howard-Grenville et al., 2017).

Being contestable and provocative was designed into the probes to trigger transformative values conversations. As probes exemplified disruptive ideas, often involving technological innovations, they may invoke ‘moral disruption’, which is “a process in which technological innovations undermine established moral norms without clearly leading to a new set of norms” (Nickel, 2020, p.259). As this invokes moral uncertainty, Nickel warns that being in such an ambiguous epistemic state can be harmful when it prevents people from understanding their own moral duties and those of others. This can cause them to adopt implausible but strong beliefs. “In such cases, we should try to see through the controversy to identify the underlying harms, to respond with compassion, and to mitigate the harm where possible by creating stability and dialogue” (Nickel, 2020, p.268). In our case, the dream station based on neuro-stimulation might have raised such moral uncertainty but was blocked before it could have raised controversy.

Nevertheless, engaging with more speculative probes enables actors to imagine the unthinkable and at the same time critically scrutinise its meaning and implications for present action. This requires actors to *not* seek closure on possible solutions to known problems and to appreciate the discomfort that such inquiry invokes. While this was relatively easy in the unreal realm, it was difficult to maintain in the real realm as illustrated by the change from probing cycles to analytical cycles. While the ‘order trap’ prevented the frontrunners from continuing to engage others in probing cycles in the real realm, we did see it again when the pandemic opened the as-if real realm.

The COVID-19 restrictions proved successful in triggering probing experiments in a non-teleological manner. Rather than carefully analysing the situation to plan their responses, the frontrunners immediately started probing experiments. They took for instance probing insights about local mobility hubs into an open-door policy of partner organisations where employees living close to each other could meet when restrictions became less stringent. Another example is how they used insights about fear of isolation when working remotely to start experimenting with online meeting etiquette to attend to social well-being. Such experiments attracted actors and held them in a systems container to embrace and contest the probed ideas. As such, probes as ‘attractives’ seed change into the system which through accumulated action potentially generates radical change (Plowman et

al., 2007). Their success does not depend on political powerplay, but on how well leaders enabled actors to endure psychological discomfort invoked. How change takes form over time does not have to resemble its original imagined form. In the case of remote work, for instance, successful experiments during the pandemic have turned into a new normal with home working being more widely accepted and is often better equipped.

These differences simultaneously highlight future probing's main challenges. As an emergent practice (Kurtz & Snowden, 2003), the success of probe-sense-respond cycles to generate emergence depends on the energy created around probes attracting actors to invest in exploring the potentials they disclose. This implies a strategy of following the energy rather than trying to convince others. Our research complements cognitive-political approaches to how the future is brought into being that emphasise convincing tactics such as framing contests, which benefit those who are most capable of foregrounding their visions or perceptions of the future (Kaplan, 2008). While such research has advocated actors' rational choice to change prevailing institutionalised frames, our research shows that such tactics may be counterproductive when it comes to deep transformative change. We base our claim on the faltering attempts to expand values conversations in the real realm by conducting conversations about probing insights rather than continuing experiential probing. We see two main reasons why expanding values conversations is hampered, which are directly related to the difficulty of linking possible alternative future imaginations to daily future-making practices.

We claim that future probing not only requires connecting future imagination and present action along content lines, but even more so along relational lines. The first, connecting along content lines, can be challenging due to the estranging character of the possible alternative futures explored that often invoke feelings of discomfort and psychological anxiety (Hirsh et al., 2012). An experiential approach offers a means to engage that anxiety rather than brush it away (Candy & Dunagan, 2017). In the practice of probing futures, we witnessed this during the exhibitions where visitors were able to postpone judgements to reflect on the visceral, emotional responses the probes invoked. (Whyte et al., 2022) underscore that online cooperation, such as during pandemic restrictions, prevents actors from building shared experiential knowledge. Similarly, we observed different dynamics in the first physical and the second online exhibitions, while this advantage was completely missing in the real realm when frontrunners tried to engage others based on thematic probing insights in a narrative rather than experiential way. Hence, we advocate continuing probing through experiential events which

emphasises generating energy that ‘attracts’ actors rather than ‘bringing’ the energy to actors through convincing tactics.

The second, connecting along relational lines, requires *empathic interrelating*, which we conceive as building strong personal connections based on emotional intelligence, empathy and practical knowing in interpersonal interactions. Empathy enhances connectedness by facilitating the sharing of neuropathways and fostering collaborative problem-solving, altruistic behaviour, and a sense of unity with others through the ‘quantum field of coherence’ (Pavlovich & Krahnke, 2012). In common terms, this involves awareness of another’s being within the system or in future-making terms an understanding of someone else’s historical place in timespace or the ‘personal baggage’ someone carries. Even simple trivia about actors to interact with can be enough to prepare soft landings for novelty as the following example from our case illustrates. One frontrunner shared to have changed tactics for stimulating bike sharing and other bicycle-related in(ter)ventions. Rather than the mobility department, the frontrunner would connect with the health department as its employees would find easier support from its manager who is a cycling enthusiast. With respect to the probing insights, we contend that the frontrunners lacked the lived experience to prepare ‘soft landings’, as they outsourced both the development of future probes to students and making sense of their implications to the mobility system (and beyond) to external advisors. From ethnographic observations of their other activities, we learned that linking with operational departments was a general challenge. It became a specific managerial assignment, for which the first step was to collect and support the formulation of departmental innovation agendas. With a limited lived experience of both probing outcomes and empathic understanding of the practical concerns of civil servants, it is challenging to establish beneficial connections between possible alternative future imaginations and daily future-making practice.

We recognised in the change from probing cycles in the unreal realm to analytical cycles in the real realm a common phenomenon of organisations tending to fall back on known linear approaches to relieve uncertainty and ‘not knowing’ how to proceed rather than enduring such uncomfortable feelings, which we recognised as an ‘order trap’ (Uhl-Bien & Arena, 2017). Though understandable, we considered this inappropriate action as it resulted in an undesired deadlock. Different reasons can be hypothesised to explain why the probes did not raise more energy, varying from inadequate probes to insufficient audience involvement. In essence, such explanations boil down to ineffective ‘staging’ (Hajer, 2009 as cited in Oomen et al., 2021). This concept expresses that it matters which and how futures are performed

or interacted with and who is involved when we hypothetically conceive the probing practice as a means to “create a certain form of order in a particular social or political situation” (Oomen et al., 2021, p.10). From this perspective, the probing practice was inadequately staged, in that it did not connect the actors to whom its content would be relevant. Selecting such actors is intricately linked to a sense of urgency either from the public gallery or the political arena, which was not present, not picked up or not mobilised.

Nevertheless, the frontrunners’ experience with the probing practice in the irreal realm became actionable when an as-if real realm emerged during COVID-19. In the next sections, we dissect the irreal and the as-if real realms from the real realm providing a better understanding of how enabling leaders – the frontrunners in our case – attempt to link alternative futures imagination with ongoing future-making through values conversations despite pull-to-order forces. Establishing an irreal realm helped to overcome a cognitive lack of imagination but could not avoid the order trap described above. Our data suggests though that establishing an as-if real realm can relieve a deadlock.

Overcoming the Lack of Imagination in an Irreal Realm

Whereas previous scholars noted the tendency of established organisations to linger in orthodox economy-driven imagination (Beckert, 2021; Wright & Nyberg, 2017) and the tension between creative and productive imagination (Rindova & Martins, 2022), we found the frontrunners in our case to engage in possibilistic thinking out of curiosity, triggered by the weak signals of change in society they had gathered. With this approach, they challenge prevailing pull-to-order forces and institutionalised beliefs (Gümüşay et al., 2020; Kooijman et al., 2017; Loorbach, 2022) exploring a unique approach to imagining and discovering alternative futures. Rindova & Martins (2022), drawing on Ricoeur’s narrative theory, theorise how organisations stretching ambitions beyond prevailing value systems, use temporal reorganisation to make their ‘distant’ future narratives appear more near and plausible. It is noteworthy that their example of distant futures in the automotive industry remains confined within boundaries that primarily serve the company’s profitability.

Scholars have highlighted the complexity of managing multiple possible futures within organisations (Wenzel et al., 2020). Despite efforts to represent this complexity, such as the futures cone that incorporates probable, plausible, possible, preferable, projected and even preposterous futures (Voros, 2019), linear progressions still dominate future representations (Selkirk et al., 2018). Selkirk et al.

(2018, p.7) advocate seeking trouble so that exploring “[t]he future becomes a site for wading in ambiguity with one’s imagination and creativity in order to notice and appreciate complexities and possibilities that were previously unavailable”. We regard irreal realms as being opened by practising future probing to offer such a space for ‘seeking trouble’.

The practice of future probing opened an inspired world – the Irreal Realm – that triggered imaginative work *stretching deep and sideways* generating genuinely alternative future imaginations in various directions. An inspired world values the bizarre and deviant over routine or habit (Boltanski & Thévenot, 2006) which involves stretching the imagination. We explicitly distinguish deep stretching from sideways stretching to emphasise both temporal depth and leaping to ‘other’ timelines in the space-time continuum. Such leap-based alternative future probes disclose unprecedented future value worlds (Hovorka & Peter, 2021) triggering potentially transformative values conversations about other than currently dominant value worlds. Engaging with such highly speculative probes is challenging as the example in Vignette 5 demonstrates, but Vignette 4 shows that even less speculative probes may invoke sideways stretching during conversations.

In our conception, the irreal realm is not merely the physical space supported by tools, diverse partners and dedicated time, but foremost an embodied experience constituted by probe-sense-respond cycles. Probing then refers to experiencing developed probes and reflecting on the visceral, emotional responses they invoke. The students were valuable assets in this practice as they creatively imagined possible alternative futures and confronted the frontrunners and others with (temporary) probes – sketches, mock-ups, digital visuals and other tangible artefacts. Probes were central to opening up irreal realms in which values conversations emerged both during probe development (between frontrunners and students) and at the exhibitions (with a larger audience). Probes so to speak ‘teleported’ interacting actors to ‘estranged familiar worlds’ (Hovorka & Peter, 2021). For instance, a visualisation of one’s future grocery shopping bag (familiar) triggered the imagination of a world in which only seasonal and locally produced food was available and proteins from lab-grown meat or insect consumption (unfamiliar) were considered normal. Such imaginations enabled actors to temporarily ‘inhabit’ such worlds postponing their judgements (Hovorka & Peter, 2021) which rendered probes into places of inquiry (Whyte et al., 2022). It is not surprising that these events featured energy and enthusiasm, which helped withstand most pull-to-order forces. Providing a safe space where inspiration is valued above other more down-to-earth values supported by tools, diverse partners and dedicated time

helped stretch imagination to develop such probes. In Chapter 2 we explained, from another case, the challenges of containing such a safe space over a longer period to enable participants to endure the discomfort brought about by imagining unorthodox alternative futures. Containing such a safe space over a longer period is conditional for emergence (Eoyang, 2001, 2007) as we will explain next.

Establishing an 'As-if Real Realm'

While the transfer from the irreal realm to the real realm ended in deadlock, as the frontrunners fell into the order trap of analysing rather than probing, we saw how the pandemic relieved the deadlock as it created circumstances similar to those explored during the first probing iteration. Drawing on the concept of exaptive practices (Garud et al., 2018), we have explained this as 'exaptive experience'. This in line with the recent change from emergent to exaptive practice in the Cynefin sensemaking framework (Snowden & Rancati, 2021, p.61). Exaptation refers to repurposing previously conceived invention in different contexts, which enhances innovative practices under uncertainty (Andriani et al., 2017; Bonifati, 2010; Dew & Sarasvathy, 2016). We built our conceptualisation of an *as-if real realm* on Augustine et al.'s (2019) notion of 'as-if reality', as we witnessed how probing ideas, tinkered with in the irreal realm, were transformed into concrete experiments during COVID-19. Following the authors' suggestion that psychologically distant future imaginations through dialectical processes become more concrete and hence taken more seriously, we suggest establishing an as-if real realm to connect the irreal realm with the real realm even when no crisis triggers such.

We find support for an as-if real realm in the literature on managerial adaptive practices and leading in complexity (Jarzabkowski, 2004; Lichtenstein et al., 2006). While adaptive practices are associated with communities of practice that connect micro-practices with macro-institutions, in complexity leadership theories, adaptive space between innovation and operational units is suggested to connect relational networks by enabling leadership (de Jong et al., 2018; Schulze & Pinkow, 2020; Uhl-Bien & Arena, 2017, 2018). Adaptive space is inhabited by brokers enabling discovery connections, connectors enabling development interactions, energisers enabling diffusion connections and challengers enabling positive disruptive connections (Arena et al., 2017). These practices allow for tension to occur through conflicting diverse perspectives and fostering relationships to engage these tensions creatively rather than foreclosing them.

Similarly, engaging in future probing in the irreal realm revolves around divergent discovery processes exploring a wide range of alternative possibilities that challenge

the status quo. This reveals patterns that were previously unseen. It follows that brokering and challenging across networks enables others to contest and align around patterns worth amplifying or dampening (Snowden, 2005). Amplifying emerging patterns requires time and space to bring alternative ideas to fruition in an as-if real realm to stimulate convergence. Hence, an adaptive space in future-making refers to the conditions necessary to effectively leverage the tension between divergent and convergent processes.

As our data show, to establish an as-if real realm, it is not sufficient to 'sell' abstract alternative ideas to others by convincing content-wise without attending to relational aspects. Issue-selling scholars have shown the importance of relationality tactics (DiBenigno, 2020; Lauche & Erez, 2023). Lauche & Erez (2023) propose the productive confrontation genre to frame issues as radical change opportunities for the future. At the heart of this genre is a team of actors who challenge each other to strengthen their ideas and challenge others from intrinsic motivation for their cause. In addition, in our case of future-making, we saw the value of collaborating from this intrinsic motivation for a while during the pandemic attracting others to also explore and practice with novel ideas. We realise that the pandemic situation was so compelling that everybody had to adjust their habitual practices, but the frontrunners engaged in collaborative experiments with a transformative mindset to trigger lasting change. Maintaining such a transformative mindset is crucial as we also saw that the crisis-induced an attitude of mere surviving leading to countermeasures when restrictions were relieved. The very 'necessity' of countermeasures to get employees back at the office also indicates the success of intensive experimenting in real-time. One of the frontrunners expressed that he hoped the restrictions would last for a long time (personal communication, 2020), underscoring the need to endure and rehearse the difficulties.

We envision an as-if real realm as a follow-up of the unreal realm, creating space for actors to engage in extensive future thinking that perturbs current practices and endure the trouble (Haraway, 2016; Selkirk et al., 2018). This can be perceived as theatrical enactment in which actors 'rehearse' pathways into a different future (Foverskov, 2020). Rehearsing with possible future worlds using probes to concretise them, allows involved actors to experience and scrutinise their implications within their personal or professional environment. This idea is not new as it resembles 'living labs' as transdisciplinary co-creation ecosystems for innovation that have become popular over the last decades in sustainable urban areas research (Hossain et al., 2019). Living labs represent both an environment and an approach favouring open innovation to induce innovative outcomes (Veeckman et al., 2013). One of the

challenges living labs face, is their scalability (Hossain et al., 2019). Practitioners and researchers have challenged the assumption that successes in demarcated physical environments are one-on-one transferable to other places as novel solutions are geared to situational specifics (Potjer, 2019). More recent work on living labs is starting to explore more systemic socio-material aspects of organising living labs to overcome the scaling issue (Yndigegn et al., 2021). Positioning a living lab, or as-if real realm for future-making, as a 'connector' between the irreal and the real realm may overcome transfer issues.

Positioning the as-if real realm as an adaptive space between the irreal and the real realm draws attention to social networks and distributed enabling leadership (Uhl-Bien & Arena, 2017, 2018). This positioning thus emphasises relational aspects in future-making, which may remedy images of a future worth striving for but insufficient to bring about desirable change. Previous research on online future-making has drawn attention to the lack of shared lived experience during online future-making practices and provided remedies to increase shared experiential knowledge building (Whyte et al., 2022). While we recognise the restrictions on experiencing online presented probes, we also saw that the pandemic seemed to increase the frontrunners' empathising with the students' conditions. This probably strengthened the frontrunners' determination to endure.

The character of the as-if real realm during COVID-19 restrictions caused everybody to have 'skin in the game'. The virus affected everybody, if not one's own physical health than indirectly through someone else's. Empathy was the key to many people adjusting their lifestyles. It is challenging to simulate such immersive circumstances ethically, yet we have observed people respond empathically to provocative probes or perhaps because students produced them. Responses such as "How effectively simple is it to show the impact of our everyday action" or "This reminds me of the overview-effect that astronauts experience when they see the blue marble" illustrate that on some occasions visitors were touched by the students' probes.

3.6.2 Implications for Grand Challenges

Grand challenges are entangled with the complexity, openness and uncertainty of the future (Ferraro et al., 2015) which links them to organisational future-making practices (Wenzel & Krämer, 2018). Our model has implications for understanding and addressing grand challenges as processes of future-making. First, it moves away from projective futures towards imagined futures (Gümüşay & Reinecke, 2024) and second, it supports a generative approach to instigate dialogue and debate about values and beliefs. The latter adds insight to robust action approaches that

emphasise maintaining some ambiguity in multivocal inscriptions to attract a wide variety of actors with diverse backgrounds and values to participate (Ferraro et al., 2015). More recently, these authors point to the difficulties of multivocal inscriptions as this ambiguity also provides space to bend meanings to fit into existing structures reinforcing values that do not contribute to tackling grand challenges (Gehman et al., 2022). However, their suggestion that some statements that effectively bind people into collective action, such as post-truth claims, propaganda or hypes, cannot be multivocal inscriptions is not helpful for better understanding multivocality. To the extent that multivocal inscriptions serve as 'shared visions' to coordinate collective yet diverse action, either by embracing or reputing them, we claim that they should foremost be provocative to render visible what is collectively not seen. The purpose of probing alternative futures by making tangible experiential artefacts is to elicit such overlooked patterns through imagination.

In their recently developed theoretical framework for 'prospective theorising' with 'speculative rigor', (Gümüşay & Reinecke, 2024, p.15) suggest that creating desirable futures starts with "imagining, or helping others imagine them" rather than projecting them from past or present experience. Our model answers the call for such a daunting endeavour by emphasising how irreal realms for extensive stretching the imagination can be opened through probing cycles. On the other axis, (Gümüşay & Reinecke, 2024, p.7) distinguish value-neutral from value-led modes of theorising, suggesting we need more value-led data for theorising desirable futures. Our model aligns with this idea positioning values conversations at the heart of the imaginative work in the three realms. We suggest, however, to continuously open up irreal realms and challenge taken-for-granted reality instead of searching for normative guidance of enduring speculative theory. This way pathways into the future are kept open, although temporary convergence is bound to happen.

To realise this purpose, our empirical model is easily adjusted by proposing and linking the establishment of three realms of future-making, to accommodate what Simon called 'future flexibility' (Gümüşay & Reinecke, 2024). Where the empirical model suggests the as-if real realm to relieve the deadlock in the real realm, our extended model suggests continuous probing cycles between irreal and as-if real realms in which a variety of possible futures are constantly explored and rehearsed that, over time, can become socially performative in the real domain (Figure 10).

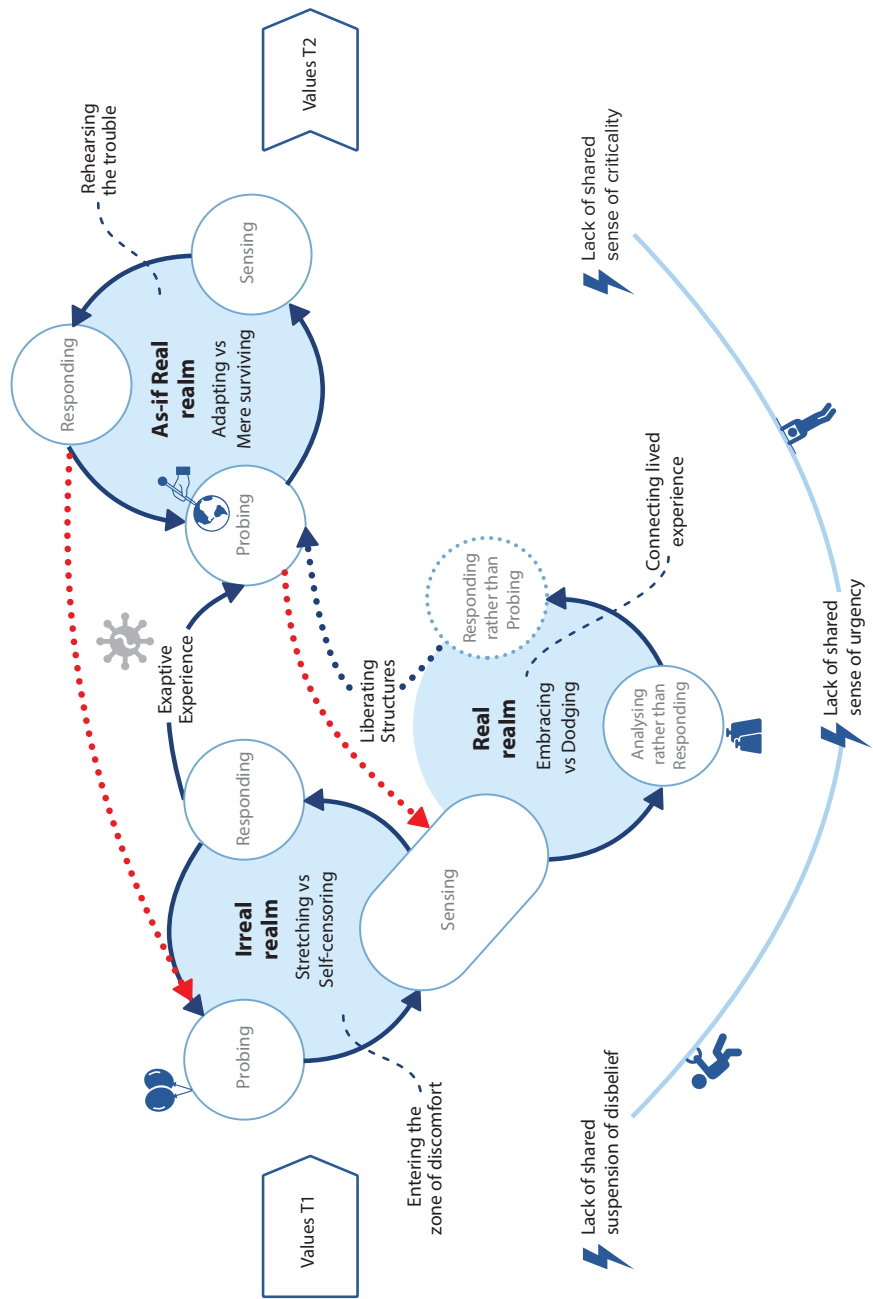


Figure 10 - Extended model for ongoing probing futures for transformative change

The model foregrounds future probing as a generative method or tool to invoke change in the context of grand challenges. Rather than being prescriptive about how futures ought to be imagined or taking a normative stance on what kind of futures are desirable, the practice of probing futures generates conditions for inquiry and dialogue about institutionalised values and novel possible value worlds through imaginative work. It thereby seeks to engage with the broadest possible range of futures that can collaboratively be imagined, which explains our emphasis on imagining non-linear possible alternative futures rather than extrapolating into the future (Augustine et al., 2019). Triggering values conversations from such a broad range of possible futures is necessary to explore and scrutinise what is desirable, to whom, and under which circumstances. As such, the realms in our model reflect different kinds of values conversations. In the irreal realm, the practice of probing futures inspires actors to imagine novel value worlds. In the real realm, such value worlds may be too confrontational to invoke deep transformative change. In the as-if real realm, rather than directly disrupting the real world, energy-triggering novel value worlds can be further rehearsed in an adaptive space connecting new and old worlds.

An as-if real realm allows actors to confront novel value worlds with the plurality of values embedded in existing institutional logics (Gümüşay et al., 2020) to find ways of adapting while withstanding their pull to order. The as-if real realm then becomes a 'site of moral multiplexity' (Reinecke et al., 2017) where legitimate courses of action are negotiated. Building on Boltanski & Thévenot's (2006) moral orders of worth, the authors developed a framework for moral legitimising negotiations between organisations and their audience. They theorised that niche organisations tend to induce 'niche legitimacy', but also that parties can negotiate 'strong legitimacy' through mechanisms of 'transcendence' (Reinecke et al., 2017). The latter is particularly interesting for grand challenges as it offers hope that organisations are not only susceptible to pressures that challenge their status quo, but also can transcend their ingrained core values. Novel value worlds disclosed through probing futures challenge such existing dominant values which triggers values conversations similar to negotiations in situations of moral multiplexity. Strengthened by our observations in the irreal realm, we believe taking such negotiations out of the real realm increases the chance of reaching agreements by 'transcendence' which according to Reinecke et al. (2017) constitutes 'strong legitimacy'.

Our research has confirmed that such can be organised in "sites of hyper-projectivity" (Mische, 2014, p.437), such as the irreal realm, where participants collaboratively

stretch their perceptions of the future to deliberate possible alternatives. While Mische's work on the UN Rio+20 meetups analyses how futures are projectively imagined through talk and text, our work includes material externalisations of imagined futures. Following the different forms probing ideas took across the three realms revealed different challenges for inducing values conversations. In the irreal realm tangible, experiential probes induced energetic values conversations as actors suspended their disbelief, postponed judgments and sought to stretch their imagination favouring unorthodox possible futures. Even actors at the exhibition, who had not been part of the probe development process, were able to do so. A similar thing happened in the as-if real realm during the COVID-19 experiments where all actors involved experienced hands-on how probing experiments tapped into different values than normal. In the real realm, after analysis, the probes were translated into rather abstract stories and insights which barely triggered values conversations. These abstractions lost their ability to trigger visceral responses in the same way the tangible probes had done. This diminished the capacity for actors to cultivate embodied cognition and relate intuitively rather than rationally.

3.6.3 Practical Implications

Our research has several implications for actors and organisations to navigate the complexity of grand challenges and engage with the plurality of uncertain and open futures.

First, probing alternative futures to open irreal realms of future-making, which is particularly useful to challenge institutionalised values and beliefs and explore alternative possibilities. Yet, influenced by systemic pull to order, actors may find themselves challenged to resist such forces. This surfaces as pulling back highly speculative futures to more probable near futures (see Vignette 5) seeking feasible yet reframed solutions to known problems (Vignette 4) which have limited capacity for transformative values conversations. This may be reinforced by the arduous task of overcoming a lack of imagination, which requires actors to enter the place of discomfort that unorthodox alternative futures may bring about. It takes effort to imagine such alternative futures in a way that they estrange the familiar, even in a preposterous way, while triggering peoples' curiosity instead of scaring them away. Hovorka & Mueller (2024) have developed criteria for futures as sites of speculative inquiry referring to their epistemic function, purpose fit within a research domain and taking a critical stance. Our study refers to tools that actors have been using in cooperation with students to develop such probes which have been developed into an open-source toolkit for using 'Futures as Compass'. Though our research has indicated some drawbacks as well, we regard the students as an important

asset for creativity in this cooperative future probing approach. Students not only offer enthusiastic creative work force, but also provide a buffer between the act of imagining often inconceivable speculative futures and people who encounter difficulties in postponing their disbelief, whether managerial or professionals pressured in their identity.

Second, while pull-to-order forces can be withstood, they also have a signalling function. Probing futures is particularly appropriate for complex challenges to discover emergent patterns that can be leveraged. Complex challenges are distinct from complicated challenges, which require other approaches (Poli, 2013). Organisational pull to order may be a signal that the probing approach is no longer appropriate. Therefore, after recognising pull to order one should always reconsider whether there is a shift in purpose or perhaps consensus about a clear goal is achieved. The question organisations can ask themselves is “Are we (still) contributing to a better future?”. While such is a political decision, that the probing practice may accommodate, once made, other more structured approaches are more appropriate, such as co-creating forward (Sharma et al., 2022).

Third, as probing futures differs fundamentally from traditional structured approaches, such as forecasting or foresight, organisations should be aware of how they are practising future-making. While practising future probing opens unreal realms that can induce energetic values conversations, expanding such values conversations in the real world – the real realm – throughout an organisation or system (e.g., mobility system) can be daunting and may lead to falling back on habitual ways of working – the order trap (Uhl-Bien & Arena, 2017). At this point, it is crucial to leverage energy created in the unreal realm instead of analysing imagined futures into abstract values or normative principles and trying to engage others through convincing tactics. Though there is nothing wrong with understanding abstract values or normative principles from probing, it is illusory that these can be enforced democratically. From a complex systems perspective, new normative principles and values emerge in organisations and society in ongoing contestation with old ones (Geels & Schot, 2007). To tap into emergent values or even generate emergence, the unorthodox content of the probed futures pressures the system, while relational aspects are important to engage others. Future probing as a practice of future-making needs actors within organisational networks to advance probing ideas disclosing unprecedented value worlds into the organisation and link them with existing initiatives in energetic and disruptive manners. This requires actors working in an adaptive space between the unreal and real realms that are well-connected to these realms to have brokering, linking up, energising

and challenging interactions (Uhl-Bien & Arena, 2018). This brings us to the next practical implication.

Fourth, we advocate establishing an as-if real realm between the unreal and the real realm to explore and nurture probing ideas and invite others to participate. Our research indicates that a single exposure at an exhibition is insufficient to generate momentum for further experimenting and “rehearsing the trouble”. However, prolonged exposure to previously explored possible futures of non-mobility during the pandemic proved effective, even considering the temporary mindset that many people had, believing the pandemic would eventually pass. Hence, the key to crafting an ongoing dialogue between a diverse, inclusive audience and material future probes seems to lie in embedding them in daily practice.

Similar to how the pandemic lockdowns folded a previously explored non-mobility future onto present reality, future probes seek to make possible future worlds conceivable in the present evoking immediate visceral responses. The COVID-19 experiments have shown that rehearsing with the trouble *as if* it were to stay causes people to start adapting to the new situation. During the pandemic, this happened when the uncertain period continued, and people started experiencing both the positive (e.g., bright skies over the Himalayas and less polluted cities) and negative aspects (e.g., social isolation or a shift in valued occupations) of the new situation.

Establishing such as-if environments without a compelling crisis, draws attention to relational aspects of orchestrating who participates in developing and dialoguing probes, as this matters for whether and how imagined futures become performative (Oomen et al., 2022). Students are valuable assets for creativity, but involving more diverse audiences such as domain experts and affected audiences – e.g. citizens or professionals in adjacent fields – increases the likelihood of emergence as it enhances significant difference conditions. While not everyone has to participate in developing probes, the unreal realms opened by them need to be experienced by diverse audiences to generate a wide range of responses and rich dialogue as we saw during exhibitions. Therefore, we suggest creating probing experiences within everyday future-making practices to elicit patterns previously collectively unseen and use them for reflection-in-action (Schön, 1992a).

3.6.4 Boundary Conditions and Suggestions for Further Research

This study's data collection spanned two and a half years, beginning in 2019 and extending through the COVID-19 lockdowns (2020-2021), during which the observed organisation underwent significant internal transformations. These

included a managerial transition, a restructuring that aimed to formalise the previously flexible team of frontrunners into an official department, and heightened job uncertainty among core team members. These changes, compounded by the challenges of remote working and pandemic-related disruptions, impacted both the organisational dynamics and data collection efforts. The research focus shifted accordingly, with the team's probing practices and related activities providing an exceptional vantage point on adaptive organisational behaviours. However, member-checking became impractical due to the departure and reallocation of key participants.

Our model is derived from a public sector case, recognising that public organisations differ in mission from commercial firms, though both must address the same societal challenges and contribute to a sustainable future. Whereas public organisations often operate from a civil value world (Boltanski & Thévenot, 1999, 2006), commercial firms typically justify actions within market or industry value worlds and, in some cases, the fame world. However, public organisations may occasionally respond from these alternative value frameworks, reflecting the influence of a neoliberal, capitalist paradigm on organisational decisions and future-making. This study's focus on probing and future-making practices encourages examining alternative orderings within, across and even beyond these value worlds, stressing relational dynamics over content-specific inquiries. Future research might further investigate content-specific narratives to illuminate imaginaries that aid transitions around grand societal challenges.

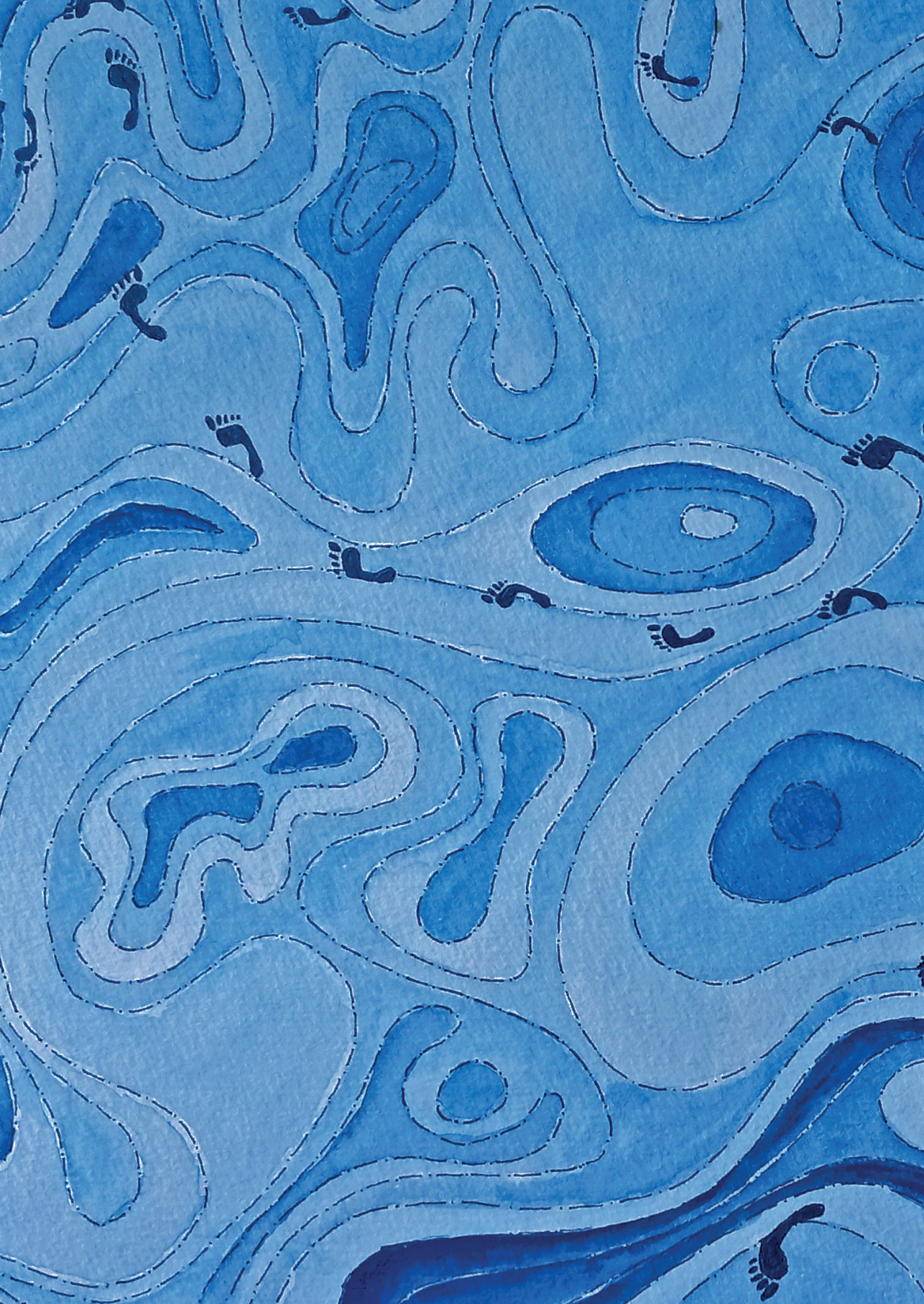
Transition-oriented roles within civil services are critical, yet systemic collective action is necessary for lasting change (Braams et al., 2021; Loorbach, 2022). Our model suggests bridging different realms of future-making – bringing together actors from the unreal realm (typically artists and inventive scientists) with those in the real realm (corporates and governments), within an as-if real realm where bold, pragmatic future-making can occur. This adaptive space (Uhl-Bien & Arena, 2017, 2018) can facilitate meaningful transitions by creating conditions that connect the idealistic with the actionable, blending creativity of unreal concepts with real-world imperatives. To advance this integration, future research could further unpack enabling practices that equip actors with skills and awareness to foster such connections. We give insight into such practices in the next chapter.

The pandemic created an emergent “as-if real realm” where actors faced unprecedented challenges, relying on intuition, lived experience, and embodied knowledge for improvisation and pragmatic problem-solving. We saw this period

as a “timeless zone”, where traditional timeframes were suspended, allowing participants to engage deeply with immediate issues and rehearsing responses. This adaptive space shifted workplace norms, particularly regarding remote work among office-based employees, opening new flexibility that many organisations continue to recognise. However, our research revealed limitations in how probing expositions allowed participants to explore alternative futures. While these contexts opened adaptive opportunities, they restricted immersive rehearsal of current troubles, underscoring the need for realistic staging. Additionally, the pandemic imposed constraints, such as health and safety issues, hindering transformative change in the long run. Future research could explore how as-if real realms could address these issues by linking them to real-world applications to foster higher-order experimentation and support the emergence of new value worlds.

3.7 Concluding Remarks

Our research underlines stretching imaginative work to challenge the prevailing normative paradigm rooted in “neo-liberal, capitalist economic models” (Forlano, 2017, p.17). Yet rather than theorising new normative paradigms – be it green, digital, symbiotic or otherwise – as suggested by some scholars (e.g., Gümüşay & Reinecke, 2022), our model underlines to act better today by probing a plurality of possible futures in the present to make sense of contested unrealised possibilities. As such, our model suggests generating and following emergent energy rather than convincingly talking desired futures into being but also warns of the trap of pull to order. The practical difficulty in adopting these understandings is to accept as part of the process that nine out of ten times no energy emerges. Such ‘misses’ are however not in vain, they are exaptive experiences that one stores in their backpack to generate emergence in a system poised for change, such as happened during the pandemic. They become the ingredients for being futures literate in recognising present opportunities.



4.

Shaping the Interplay between
Emerging Alternative Possibilities
and Present Realities: Relational and
Cognitive Scaffolding Practices

Abstract

This study investigates how actors shape the interplay between emerging alternative futures and everyday future-making. We followed a team of explorers at a public organisation working on the sustainability transition in the mobility domain during 18 months of ethnographic field study. Taking a practice lens, we focused on the frontrunners' efforts to shape the interplay between emerging alternative possibilities and present realities. The study reveals cognitive and relational scaffolding practices activating mechanisms of envisioning alternative futures, concretising emergent futures, containing discomfort and confronting concerns. Our findings suggest that only concretising abstract alternative future imaginations is insufficient to elicit concerted action towards such futures. It also requires attending to entrenched emotional discomfort and practical concerns that alternative future imaginations evoke. We contribute to the literature on future-making in the context of complex grand challenges by offering a process model that demonstrates how relational connecting provides a basis for building cognitive structures that support the alignment of diverse perceptions of the future. Previous versions of this chapter were discussed at different conferences such as PROS and EGOS as:

Earlier versions of this chapter were discussed at the following conferences:

Maessen, C., Lauche, K. & Van der Lugt, R. (2022). Distant and near futures scaffolding practices to create alignment for radical innovation. Paper presented at 13th International Process Studies Symposium (PROS), Rhodes, June 25-28.

Maessen, C., Lauche, K. & Van der Lugt, R. (2023) Distant and near scaffolding practices to create alignment for radical innovation. Paper presented at 39th EGOS colloquium [SWG] Shaping Desirable Futures – Imagining (Real) Utopias, July 3-7, 2023, Cagliari, Italy.

4.1 Introduction

Recent calls on organising for sustainable futures emphasise the need for ‘seeing anew’ (Howard-Grenville, 2021a) and guidance from desirable future imaginations (Gümüşay & Reinecke, 2022). Transitioning towards sustainability requires systems thinking and transformative change (Grewatsch et al., 2023) towards a future recognised as unknown and unknowable (Wenzel et al., 2020). Envisioning, foresight or other practices to forecast or speculate about possible futures are not a panacea for organisations to transform unsustainable practices and tackle grand challenges. They do generate negotiable imaginations, which shape and are also shaped by organisational future-making practices – i.e., how the future is produced and enacted (Wenzel, 2022). However, we lack a profound understanding of how actors and organisations engage in alternative future imagination and everyday future-making practices, how they flesh out and interrelate with other practices, particularly concerning how organisations contribute to shaping the future. In this paper, we investigate how actors shape the interplay between emerging alternative futures and present realities.

Organisations play an important role in the production of grand challenges and have the potential to shape their impact (Gümüşay et al., 2020). Yet, organisations, especially those with a long history of standardised ways of doing things, seem to linger in existing practices and institutions that constitute organisational life (Wright & Nyberg, 2017). Having brought the daily prosperity many enjoy, changing such practices involves uncertainty about what one gets in return. There is neither clarity on which new practices one needs to change to nor on guidance of concrete and desirable images of the future (Gümüşay & Reinecke, 2022; Wenzel et al., 2020). Furthermore, organisations are subject to a collective crisis of imagination (Fotaki et al., 2020; Komporez-Athanasidou & Fotaki, 2015) that hampers deep transformative change (Loorbach, 2022).

Scholars acknowledge organisations’ struggle to manage the uncertain future (Wenzel et al., 2020), yet also recognise their ability to shape the future through fictional expectations they deem relevant (Beckert, 2013, 2021). To the extent that those fictional expectations are confined to current paradigms, this ambiguity implies a need for approaches that go beyond past orientations and consider the unintended and unforeseen long-term implications of complex societal challenges. Research highlights how different perceptions of the future influence organisational responses to grand challenges (Lê, 2013). Scholars distinguish between rational and non-rational imagination, such as near versus distant futures

(Augustine et al., 2019), probabilistic versus possibilistic thinking (Grimes & Vogus, 2021), orthodox versus unconventional imaginaries (Dey & Mason, 2018) and plausible versus desirable (Rindova & Martins, 2022). These distinctions suggest cognitive approaches to overcoming the crisis of imagination, yet we contend that the lack of imagination also involves resisting organisational forces for stability (Uhl-Bien & Arena, 2017). We investigate the role of explorative civil servants' future-making practices in shaping the interplay between emerging alternative futures and present realities in a public organisation. Public organisations are expected to guide and govern transformation processes, including 'giving direction' and 'supporting the new' (Braams et al., 2021) yet, to effect deep transformative change, it is necessary to engage in collective action at the systems level. (Loorbach, 2022). Hence, a public organisation gives us a particular opportunity to investigate how actors on a practice level contribute to system-level changes. A practice perspective enables us to study transformative future-making practices from the perspective of involved civil servants, guided by the following research question:

How do actors shape the interplay between emerging alternative possibilities and present realities?

We address this question by borrowing the notion of scaffolding from the literature on knowing in practice (Orlikowski, 2006). Drawing on constructivist approaches, organisational scholars have addressed scaffolding primarily as creating cognitive structures to support people in learning or adopting novel practices (Casasnovas & Ferraro, 2022; Swan, 2006). While acknowledging that scaffolding can take many forms, such as material, cultural, relational and cognitive structures (Casasnovas & Ferraro, 2022; Roberts & Beamish, 2017), this research maintains a realist, pragmatic perspective that stresses 'planned steering' towards convergence and alignment. Indeed, Mair et al. (2016, p.2036) state that "scaffolding requires active planning and cannot rely on self-organising". However, we argue that this intentional directionality is only visible in hindsight and overlooks the emergent responsive character of scaffolding practices in the making. We aim to address this gap by unpacking the future-making practices of a team of frontrunners in a public organisation in terms of scaffolding that shapes the interplay between emerging alternative future imaginations and present realities.

Taking a practice approach to future-making, we examine the interplay between imagination and future-making practices through which actors in organisations give form to the future (Wenzel, 2022). Our contribution to the literature on future-making practices is the understanding that cognitive scaffolding is insufficient for

concerted action in the context of complex grand challenges. Cognitive scaffolding benefits from careful relational scaffolding not only to combine different knowledge instances as previously suggested in boundary-spanning literature (Roberts & Beamish, 2017), but foremost to provide containment of anxiety and resistance invoked by dealing with novelty (Hirsh et al., 2012; Nordgren & Schonthal, 2022).

Next, we provide the conceptual background of this study and address our abductive methodological approach with 4 analytical iterations of going back and forth between data and literature. The findings section presents empirical evidence for scaffolding practices through illustrative vignettes. Finally, we present our process model of scaffolding between alternative future imaginations and present realities and discuss our findings and contributions to the literature on future-making practices by highlighting the role of relational scaffolding as a basis for engaging in cognitive scaffolding.

4.2 Conceptual Background

4.2.1 Future-making Practices and Potentialities

Future-making is about how actors orient themselves towards and give form to the future (Whyte et al., 2022). Previous organisation research has focused on strategic 'building' approaches to the future, such as forecasting and foresight that perceive the future as something to create or prepare for gaining competitive advantage or as a situated activity of dwelling in the present by coping with what emerges (Chia & Holt, 2006; MacKay & Chia, 2013; Tsoukas & Sheperd, 2004). A practice approach to future-making takes a middle stance focusing on how actors produce and enact the future through situated activities in which past experience and future imagination are considered in unity with present action (Comi & Whyte, 2018; Wenzel et al., 2020). Social practices are performed by knowledgeable actors who are constrained and enabled by the very structures they produce and reproduce (Rouleau & Cloutier, 2022). Hence, a practice perspective on future-making regards the future evolving from the interplay between situated agentic shaping activities and unintended or unforeseen consequences (Wenzel et al., 2020; Wenzel & Krämer, 2018).

Previous literature on future-making practices addresses organisational shaping capacity on situated future-making, highlighting the use of narratives (Rindova & Martins, 2022), artefacts (Comi & Whyte, 2018), practical knowledge (Thompson & Byrne, 2022) and online future-making (Whyte et al., 2022). While focusing on

organisational future-making as a situated activity uniting past, present and future, most scholars do not zoom in on the distinct implications of different perceptions of the future for shaping present action (see Rindova & Martins, 2022 for an exception). Studying social imaginaries, Augustine et al. (2019) draw attention to this distinction in their study of geoengineering. The authors theorise a qualitative distinction between psychologically distant and near-future imaginations building on Liberman & Trope's (1998; Trope & Liberman, 2010) construal-level theory. Their key insight is that this distinction rests not on linear temporal depth but on perceived distance from lived experience. Augustine et al. (2019) illuminate how distant imaginations gain 'as-if reality' by becoming more concrete through a dialectical process revolving around various social imaginaries without the intention of implementation but suggest further research on how such imaginaries become reality. Lê (2013) demonstrates that how organisations perceive future developments in climate change influences their current actions, while (Beckert, 2021) warns about the power of organisations to shape present realities based on fictional expectations they deem appropriate. There is, however, a paucity of knowledge regarding how actors and organisations tap into alternative future imaginations to shape present realities deemed important to addressing complex societal challenges (Gehman et al., 2022).

Recently, organisational scholars have begun advocating the studying and theorising of future-making practices that produce desirable futures (Gümüşay & Reinecke, 2022). Desirable futures represent alternatives to prevailing institutions but can either be imaginary or 'real', meaning that they are "rooted in potentialities of the present" (Gümüşay & Reinecke, 2022, p.238). Such potentialities are difficult to identify because they "have not yet been constructed by human action" (Lord et al., 2015, p.269). Mische (2009, 2014) suggests researching 'sites of hyper-potentiality' where possible futures are imagined and subject to public political debate. In response to no longer effective linear methods in future-making based on prediction, planning and control (Li & Sullivan, 2022; Tsoukas & Sheperd, 2004; Wenzel, 2022), imagining desirable futures is thought to provide imaginaries that guide current activities.

While it has been suggested that backcasting from desirable futures has the potential to develop pathways that render them more likely (Gümüşay & Reinecke, 2022; Sharma et al., 2022), backcasting does not address how to keep course when circumstances over time change, whether exogenous, like a pandemic or endogenous, like collaboration difficulties. Backcasting may help to generate shared visions, yet setting goals to achieve them limits the range of possibilities

for present action (Snowden & Rancati, 2021). From a complexity perspective on change, potential desirable futures can best be imagined as “*attractives*, things that draw or pull others to them”, while those others are “*actives*, people who are looking for or open to what is being offered” (Ford & Ford, 1994 as cited in Plowman et al., 2007, p.539, italics in original). Plowman et al.’s (2007) study on the accumulated effects of serving breakfast to the homeless at Mission Church shows that it is only in hindsight visible what pivotal events invoke a desired change. Hence, imagined desirable futures may serve as attractives pulling actors in to leverage their potentiality, but it is impossible to render them performative by a priori design. Taking this into account, we seek to identify future-making activities that leverage the pull to potentiality of emerging alternative futures.

4.2.2 Scaffolding

We borrow the notion of ‘scaffolding’ from the literature on knowing in practice (Orlikowski, 2006) to interpret the underlying mechanism of the practices we saw in our case. With reference to the construction industry, Orlikowski (2006) draws attention to the materiality of knowledgeability metaphorically illustrating the structuring of human agency by their material surroundings and the artefacts they interact with. Casanovas & Ferraro (2022) explain speciation in nascent markets through cultural and material scaffolding. They particularly focus on the learning aspect of scaffolding, for example how the proposal of new field frames provided the cultural infrastructure that enabled people to envision alternative future scenarios. Mair et al. (2016, p.2023) see scaffolding as “a process that enables and organises the transformation of behaviour and interaction patterns”. In their study on social inequality, they identified the mechanisms of mobilising resources, stabilising new desirable patterns of interaction and concealing unanticipated and undesired goals to make transformation processes adaptive and emerging alternatives robust. Organisational scholars mainly address scaffolding in terms of cognitive structures that enable individuals and collectives to learn and adopt novel thinking or behaviour in line with constructivist learning and education relying on knowable cause-effect relationships and anticipation.

The notion of scaffolding is linked to constructivist learning theories (e.g., Vygotskiĭ & Cole, 1978) where it refers to “temporary adaptive support [...] bridging current state of the student’s abilities with an anticipated future state” (Shvarts & Bakker, 2019, p.19). Scaffolds are frameworks and guidance that experts provide to novice learners to support their learning in the ‘zone of proximal development’ (Roberts & Beamish, 2017). The zone of proximal development determines the boundaries within which a novice is able to absorb new knowledge. This zone stretches novices’

knowledgeability by offering ways to experiment with and rehearse using new knowledge and know-how. Proximal indicates that new knowledge must be novel, yet attainable with existing cognitive structures. For example, learning to drive a car builds on cognition constructed from taking part in traffic, riding 'shotgun' and generally operating machinery. This constructivist notion has been applied to scenario planning to emphasise the importance of performing the practice rather than achieving an outcome – i.e., a particular scenario – that may become performative (Chermack & van der Merwe, 2003). This perspective is useful to our understanding of activities in our case directed at shaping the interplay between imagined alternative futures and present realities in which operational civil servants needed to open up their current practices to adopt new ones.

We build on this constructivist approach to scaffolding as temporary performative practices to explain how various actors contested and aligned different perceptions of the future at play within the organisation and the field. Yet we also stretch the notion of scaffolding to encompass the relational aspects we observed. Although scaffolding has been described in many forms, cultural, material, cognitive and relational, even the latter has mainly been interpreted in relation to knowledge and learning. For instance, Roberts & Beamish (2017) argue that boundary spanners need to build many relationships to gain access to knowledge and partnerships. We use the notion of scaffolding to interpret the actors' ability to withstand the structural pull to order – i.e., sustaining the status quo.

4.3 Methodological Approach

Our case study took place at a Dutch public organisation where a team of explorative civil servants was working on the transition towards a sustainable future in the mobility domain. We met the team during an exploration of mobility futures together with students, which is one of the events they engaged in to concretise and make sense of weak signals of change. This trajectory was exemplary of their practices, involving activities that aim to connect envisioned possible futures and novelty to concrete action in the present, hence future making. While the team worked with an innovation funnel, with the stages of exploring, experimenting, and expanding, the actual objects of innovation are not the technology or technological applications themselves, but the ecosystems, governance and sometimes financial structures that help experiment, develop and implement innovations deemed relevant for future mobility. Simultaneously, the team did not eschew advocating the need for specific existing structures to be phased out (Hebinck et al., 2022).

Their holistic approach to the mobility transition prompted us to regard their practices as future-making. A practice approach to future-making draws attention to “both the mind *and* the body, and both the discursive *and* nondiscursive – i.e., bodily and material – dimensions of the ways in which actors engage with the future” (Wenzel et al., 2020, p.1444, italics in original). Taking a practice approach (Nicolini, 2012) to future-making, we witnessed the explorers’ efforts to connect novelty and insights from possible alternative futures to daily operational future-making practices within the organisation.

4.3.1 Research Setting

The team, having a semi-formal status directed by a manager, entailed a diverse group of civil servants from various departments within and related to the public organisation. Their task was to shape the organisation’s orientation towards the future by picking up and exploring remarkable novelty in the field and preparing decision-making about whether to pursue courses of action that allow such novelty to develop into new socio-technical regimes (Geels & Schot, 2007). Along the way, they acted creatively to overcome obstacles and seize opportunities as they tried to involve operational departments in their future-making practices. As we took on our research, the group had been active as a team for approximately 4 years. The composition of the team had diverged into a small group of explorers and a larger group of actors involved in thematic projects such as mobility as a service.

Our research focuses on the explorers’ practices and their perspectives on the team as a whole because they were committed to initiating activities that go beyond incremental change. They paved the way for more radical change that breaks away from the status quo but also had an eye for its disruptive impact on current ways of doing things both internal and external to the organisation. The explorers frequently engaged in novelty explorations, which could gradually evolve into experimental projects and ultimately expand into new socio-technical regimes. Their future-making practices were directed at such ‘exploration journeys’, which either had an incremental or radical character. For example, they would explore the possibilities of avatars in remote working as well as pave the way for the introduction of light electric vehicles on the public road. Our research focused on the more radical explorations in the sense that their full expansion would drastically alter the current mobility system. The explorers’ interests affected which novelties were picked up from which expertise domains. After quickly scrutinising relevance and maturity, the manager took the final decision on whether to invest in further explorations. Not yet matured novelty was archived and monitored.

The explorers met on a weekly basis, to discuss signalled novelty, ongoing explorations and other projects they worked on. Their meetings were open to actors in the projects, but many of them were too immersed in thematic experiments or expanding projects to attend. The explorers themselves were not full-time committed to explorations or signalling novelty. They were also involved in projects in the experimenting stage and sometimes even in the expanding stage, as projects tend to slowly evolve through the funnel. Especially the line between the exploration stage and the experimenting stage was vague. The terms were sometimes used interchangeably by the explorers. The explorers also prepared weekly thematic meetings with the whole team. Thematic meetings were open to guests from the line organisation to enable information flow and exchange between explorers at various projects.

4.3.2 Data Collection

Data were gathered during 20 months of organisational ethnography (Ybema et al., 2009) and relied on observations, document analysis and interviews with members of the team. The primary author focussed her observations on the practice of the explorers' sub team (working at the beginning of an innovation funnel) during their weekly meetings and the weekly thematic meetings with the extended team, initiated by the explorers. She also was part of the extended team's WhatsApp group and their regular workflow systems. Due to covid19 measures, meetings were mainly online. This had an impact on the research conduct as the practice of the team changed. The explorers needed to adapt to the unfamiliar way of working which resulted in a reduction of informal conversations that usually take place just before or after a meeting. Observing swift bilateral interactions on the work floor was impossible because the informal work floor was no longer accessible. Such informal meetings became planned online bilateral meetings or phone calls which remained invisible to us. This rendered the primal researcher dependent on whether a subject of a small group conversation was addressed during the two main meetings. The weekly meetings gave rise to observing additional small group meetings in which a subgroup prepared a discussion about streamlining the explorers' activities to increase organisational innovative power.

The data consists of over 180 hours of meeting observations of which extensive notes were taken, complemented with 13 recorded and transcribed interviews and notes from informal conversations at the few meetings on location. Interviews focused on ongoing and past exploration journeys and elicited consecutive events and interactions that the interviewee engaged in. We ended the interview using the technique of the 'interview to the double', asking interviewees to explain to

their double how to take over their work without others noticing the difference (Nicolini, 2009). Because we wanted to understand their consecutive work on one exploration journey, we asked them to focus on their most prominent journey, while allowing for relevant side roads to identify connections to other journeys. We further had access to 90 exchanged documents, 126 intranet items, over 1500 WhatsApp group messages and 42 weekly e-mail updates by the team's manager. A research journal was kept connecting findings with literature.

4.3.3 Data Analysis

We took an abductive approach to analysing our data in several iterations (Timmermans & Tavory, 2012), going back and forth between data and sensitising concepts from literature (Bowen, 2006) to identify surprising patterns in the data (Bamberger, 2018). Data analysis evolved while data collection also proceeded. Preliminary findings were fed back before the last iteration in two communicative validation sessions with the explorers as described below.

Iteration 1: Identifying Occurrences of Connecting Alternative Futures with Present Reality

A first reading of our observation notes allowed us to identify 'occurrences of connecting' – i.e., activities to shape the interplay between emerging alternative futures and present realities – in the explorers' future-making practices. We looked for clues on how explorers tried to connect ideas and insights about the future to future-oriented courses of action in the present. We used visual mapping (Langley, 1999) to reach a general understanding of the teams' future-making practices over time, discerning various activities and contextual aspects that accelerated or slowed down attempts to make a 'future-present' connection. Initially using sensitising concepts from innovation and adaptability literature (e.g., Uhl-Bien & Arena, 2018), one emerging theme was the explorer's perseverance in attempting to connect novel technology or applications thereof deemed relevant for envisioned mobility futures with present operational action despite persistent complaints about the operational departments' focus on conventional futures. Triggered by this difference in perceptions of the future and the primary researcher's previous experience with methods to probe the future, we searched further literature beyond the standard works on ambidexterity and the innovation dilemma.

Iteration 2: Recognising Different Modes of Thinking About the Future

In a second read of the observation notes and documentation (e.g., internal white papers on their work practices and year reports) and re-examination of the visual map of their future-making practices, we used Augustine et al.'s (2019)

notions of psychologically 'distant and near futures', 'gaining concreteness' and 'as-if reality' as sensitising concepts. We noticed that exploration journeys were either driven by conceptual explorations or by concrete experimentation. At the system level, we characterised some journeys as more disruptive and others as more continuous to current regimes. We hypothesised that more psychologically distant and explorational novelty would provoke more resistance. During the pandemic lockdown, we used an online whiteboard tool for member checking this preliminary conceptual model. We categorised their activities on a 'futures landscape', spreading vertically from as-if reality to reality and horizontally from continuous to disruptive. Our conversations with the team of explorers revealed that what we characterised as near experiments can impose disruptive forces on a practice level, requiring a complete change of current operational practices. Also, projects travelled over time from one corner to the other, and within each project, there were elements in different corners. It matters whose perspective one takes.

These insights shifted our focus to the discrepancy between the explorers' perception of their approach to disruptive novelty – whether technology or new ways of organising – and how they perceived the approach of operational departments they encountered. This discrepancy resonated with the literature on psychologically distant and near futures, where different perceptions and modes of construing the future are evident (Augustine et al., 2019). We identified the disparate approaches of the explorers and operational departments as distinct modes of future-making involving different kinds of imagination.

We interpreted the distinctive character of practices concerning alternative future-making as a 'pull to potentiality', which we recognised in many of the explorer's activities. We interpreted the operational departments' conventional, near-future-oriented actions as a 'pull to order' – i.e., still future-shaping but within conventional paradigms and organisational structures and simultaneously resisting the pull to potentiality of alternative futures. These interpretations were further validated by presenting how observations were linked to theoretical concepts to the larger team of frontrunners. Timed amidst turbulent changes in the organisational structure and composition of the team, they confirmed that our interpretations were recognisable and raised discussion about directions for future activities of the team. Interpreting the discrepancy in future-making practices explained some of the difficulties the explorers encountered in terms of different objectives and language but did not explain their past successes, which needed further unpacking of what happened during interactions in the exploration journeys that revolved around novelty they had picked up.

Iteration 3: Understanding Manoeuvring Between Alternative and Conventional Modes as Scaffolding

Zooming in on several specific exploration journeys, we wrote composite narrative vignettes (Jarzabkowski et al., 2014; Langley & Abdallah, 2011) to understand the relational and temporal entanglements between the explorers, the operational departments and other stakeholders. We based the vignettes on journey-specific interviews that we open-coded, clustered into themes and completed with information from other relevant sources, like archival documents to get the timelines and specific details accurate and field notes taken during explorer meetings. We used narrative analysis (Langley, 1999) to scrutinise the vignettes for recurring patterns in the explorers' activities and behaviours.

We identified recurring 'showing' and 'telling' activities. Showing was used to propose alternative futures and how they could be possible both from imagination with and from experiments in the field. It involved a creative act, abductive, integral and holistic thinking and was considered more against the grain. Telling was used to ground such proposals with scientific means and involved solid research, calculations or cost-benefit analysis, albeit based on models and assumptions. It emphasised concrete goals and temporal and contextual boundary conditions of the proposals. The agency and directionality of their efforts and the going back and forth between the entrepreneurial mindset of actors in the field and the operational mindset reminded us of scaffolding as a metaphor.

We delved further into the literature on scaffolding from knowing in practice and its constructivist roots in education. We came to realise that the performativity of the explorers' practices in the interaction with others supported those others to align their perceptions of the future, although this paradoxically involved contesting and scrutinising proposed ideas about alternative futures. Sustained relational connecting, however, allowed actors to loosen the conventional, near-futures orientation embedded in their regular future-making practices and at least temporarily embrace an alternative, more distant future orientation. Although this adds a temporal dimension to the scaffolding practices, we preferred to stress the paradoxical tension in cognitive processes. During sustained interactions between the explorers and operational actors, this tension was contained by the explorers building on existing trust relationships and practical wisdom from previous experience. We labelled the interaction practices *cognitive scaffolding* and *relational scaffolding*, to emphasise that tensions were not resolved but converted into functional performance. These labels emphasise adaptive capacity involving cognitive flexibility – the ability to adapt one's thinking and problem-solving

strategies – and relational adaptability – the capacity to adjust interactions and relationships based on evolving needs or contexts.

Iteration 4: Conceptualising the adaptive dimension of scaffolding practices

To further our understanding of the adaptive dimension in scaffolding practices – going back and forth between cognitive and relational scaffolding – we zoomed in on the drone registration journey, which the explorers perceived as a successful accomplishment. However, we constantly checked for consistency with other journeys' vignettes, such as tube transportation. Using temporal bracketing (Langley, 1999) we identified turning points in the exploration journey marked by changes in the narratives (Tsoukas & Hatch, 2013) that circulated about drone mobility. We recognised such narratives to function as imaginaries influencing responses within the ecosystem (Lê, 2013).

To understand the relationship between changes in these narratives and the activities of the explorers, we scrutinised the vignettes and identified bundles of activities that coincided with such turning points. The bundles of activities activated different mechanisms that allowed actors to contest and align different perceptions of the future and to endure and eventually transcend related discomfort and concerns. These mechanisms operated on deeper abstract and concrete levels depending on the object of the scaffolding. The objects were either content-related, such as abstract imagined futures or specific applications of novelty, or situated in momentary interaction patterns, such as surfacing discomfort or practical concerns. We labelled these mechanisms *envisioning* alternative futures and *concretising* emergent futures in cognitive, content-related scaffolding, and *containing* discomfort and *confronting* practical concerns in relational scaffolding (Table 4). During interactions while engaging in scaffolding practices, narratives emerged that were harvested and 'stitched' together into a compelling narrative that over time shaped the interplay between emerging alternative futures and present realities. In Table 4 the harvesting process is illustrated in the central row to indicate how these narrative arguments emerged from going back and forth between cognitive and relational scaffolding. Therefore, this row has no separate mechanism.

Iteration 5: Synthesising and theorising

In the final step, we synthesised our findings into an emic account of the change process from within the system. This way, we could illuminate how the explorers dwelled in situated activities until irreversible convergence patterns emerge. It reveals how actors work through several emerging dilemmas that could not have

been foreseen. Some dilemmas evoke choices that may not seem to contribute to the change but without them, subsequent choices might not have been the same. Against this backdrop, we present our process model of relational scaffolding as a basis for cognitive scaffolding in the discussion.

In the findings section, we will provide empirical evidence for the concepts of cognitive and relational scaffolding and unpack the configurations of practices, activities and mechanisms that we saw conjure up the transformation in the drone ecosystem illustrated by vignettes from the drone journey. The vignettes are interlaced with translated quotes to make the stories come alive, yet to prevent traceability, we refrain from displaying any information that might link quotes or events together. Furthermore, we refer to actors involved in more disruptive future-making practices as 'the explorers' to distinguish them from other actors and plural to prevent identifying individual actions. All individuals and parties in an operational role are referred to as 'operational actors' or 'operational departments' to distinguish them from the explorers, but not from each other.

4.4 Findings

In this section, we unpack the configurations of scaffolding practices, activities and mechanisms that led to the transformation in the drone mobility ecosystem, seen from the perspective of involved explorers at the public organisation. We focus on the drone journey to unravel cognitive and relational scaffolding practices. The specific part we draw on – drone registration – was considered successful by the explorers, yet drone registration was not an a priori-defined goal to achieve. Drones had been on the organisation's radar before the formation of the explorers' team. After a history in the military domain, remote controlled 'toy' and after 9/11 a revival in the military domain, technological development had reached a level where useful applications with public value – one of the maturity criteria the team used – asked for serious attention. For instance, camera-equipped drones had gained societal value for detection and surveillance since the new millennium and became widely available as consumer or professional products perturbing the aviation system that previously dominated airspace. While the explorers had been monitoring developments in the field out of curiosity, they became actively involved when they picked up signals from progressive players in the field that procedures and legislation were getting in the way of development and experimentation, and reports of incidents between drones and commercial aviation increased. This made tightening up the measures more likely than relaxing them. For the explorers, both

Table 4 - Analytical structure Study 3

Examples	Circulating narratives
• With drones, it was not the new technology that was picked up, but the random applications that had led to increasing incidents [<i>pressuring weak signal</i>] which induced envisioning ways to organise experimentation instead of allowing for uncontrolled growth. • In the minister's letter to parliament, drones were envisioned as part of an integral mobility perspective focusing on infrastructure inspections, smart farming, safety (counter drone facilities) and delivery logistics. [<i>pressuring call for action</i>] which provided legitimacy for action. • Identifying integral mobility and cross-sectoral cooperation as drivers of change evoked envisioning how such drivers could play out for specific stakeholders [<i>pressuring wake-up call</i>] which made operational actors understand that their playing field is broadening.	"drones as a novel mode of transportation in an integral mobility approach" [<i>alignment</i>]
• Due to a lack of experimentation space actors went abroad, where they experienced restrictions and procedures as less complicated. Drones could not grow on a national level and losing knowledge. [<i>dilemma</i>] • Experiments that applied drones to inspect infrastructure engineering works, familiar practice to civil servants, made concrete what was needed to explore its impact on the mobility system as a whole (e.g. no need to block road traffic, how to deal with out-of-sight drone piloting). [<i>liberation</i>] • The explorers sensed that the authority that felt responsible by mandate struggled to move forward due to a lack of capacity and competencies not because they were unwilling. [<i>dilemma</i>] • The more holistic view and an integral air mobility perspective, offered by the explorers, pulled participants out of their siloes and made them think of opportunities for cross-modal collaboration. [<i>liberation</i>]	"drones as dangerous invaders of commercial airspace; "You are not allowed to experiment, unless..." [<i>contestation</i>]
• In line with a more integral perspective on mobility instead of a specific focus on road mobility, the promising perspective of the integral mobility director emerged and proved appealing to a road-traffic-focused organisation showing young prospects their innovative image. • Framing drones in line with the flying car legitimised the allocation of this flying vehicle to road and waterway specialists. Also emphasising developments in safety precautions like GPS technology to ban drones from specific (military) areas. • Authorities, scientists, top officials and international network partners were mobilised to advocate future perspectives from different perspectives. Also, the financially strong, large partners behind the first experiments were not easily pushed aside. • Address the limitations of the narrative. A narrative is valid now, given these partners and environmental settings. E.g. the drone registration narrative works for small drones flying in visual range. • The narrative may need adjustment over time or for an expanding scope. E.g. the drone trajectory instigated an exploration into narratives around 'test and experimentation space for all aviation' and also a more integral perspective on air mobility emerged that breaks away from the traditional view associated with aviation.	"drones as a catalyst for integral mobility and a new identity for its future director."

Bundles of activities	Mechanisms	Practices
• Scanning horizon for signals of change • Exploring new paradigms and frames • Identifying preferable drivers	Envisioning alternative futures	
		Cognitive Scaffolding
• Gathering or initiating experiments with potential benefits • Building up external pressure • Using sensing and intuition and confronting tensions between current and new practices	Concretising emergent futures	
• Providing attractive perspectives for different stakeholders • Matching new with existing values • Mobilising supporting authoritative powers • Specifying boundary conditions of the narrative (time & context); being honest.	Harvesting compelling narratives	

Table 4 - Continued

Examples	Circulating narratives
- Using relations to understand the obstacles within the ecosystem. Drone registration was a prerequisite to establishing a regulated and safe innovation climate. The insight emerged that drones differ from existing aircraft concerning safety challenges and that the number of privately owned devices is more likely comparable to cars than planes. Combining such insights generated knowledge about the root cause of stakeholders' reluctance and inaction. [<i>relational dilemma</i>] - Abductively combining knowledge of practices across boundaries offered the solution to close the capacity & competence gap for handling drone registration by one authority with established practices by another authority. [<i>liberation</i>] - EU rules and regulations preceding national regulations created urgency and an incentive to make it work following the formal route on the national level. [<i>liberation</i>]	"drone experiments under EU directives;" "You can experiment, provided that..." [<i>transcending</i>]
- Management saw possible detrimental risks [<i>reputation anxiety</i>] which were alleviated with narratives about analogies of the past (e.g. introduction of the automobile), prospective departmental identities (e.g. integral mobility coordinator) and general knowledge about innovation processes (e.g. ongoing journey, still developing technologically, safety measures). - Uncertainty about unknown and unknowable outcomes (e.g. sustainability cost-benefits). [<i>failure anxiety</i>] which was tackled with (preliminary) calculations. - Potential distrust in the harbingers of the novelty and their process [<i>loss of control anxiety</i>] alleviated by the personal track records of the involved explorers, by coming alongside instead of playing the consultant, taking a step-by-step approach of moulding instead of pushing through, following the formal hierarchical pathways where possible, and being in it for the long haul. "Don't give up, find an outlet for your frustration within the team. Feel supported by management".	"with drone registration, the innovation is not complete." [<i>enduring</i>]

Bundles of activities	Mechanisms	Practices
- Combining knowledge across boundaries - Establishing an organising structure (make it feasible) - Adjusting rules and regulations	Confronting concerns (practical, legal and organisational)	
		Relational Scaffolding
- Providing the big picture - Demonstrating (long term) benefits - Gaining trust and trustworthiness	Containing discomfort	

signals were reasons to update the ecosystem and governance structures, which they aimed to shape by generating conditions that would enable operational actors and players in the field to act.

The drone journey is exemplary of the explorers' way of working with alternative future imaginations to influence present courses of action. Realising that present realities tend to push back, the explorers typically embarked on an exploration journey interacting with actors in the ecosystem. Rather than pursuing specific goals, they act on emerging clues to create conditions for interactions that may amplify into desirable change. We present these activities through the analytical lens of scaffolding. Our data show *cognitive scaffolding* practices that activate mechanisms of *envisioning* and *concretising* alternative futures in the interaction between explorers and operational actors. Cognitive scaffolding supported engagement with the 'pull to potentiality' of such futures. More surprisingly though, more effort went into relational scaffolding practices that activated mechanisms of *containing* discomfort and *confronting* concerns. This supported actors to withstand systemic 'pull to order' – forces that aim for stability and resist change in response to pressure in the system, in this case, the proliferation of drones occupying airspace. Furthermore, we discovered that through these practices narrative arguments emerged that were harvested by the explorers and skilfully reused or adapted during their interactions with different stakeholders.

The vignettes in this section revolve around two insights that emerged from relational scaffolding, which offered a basis for cognitive scaffolding practices that through a dialectical process of contestation and alignment led to transformation. Transformation in this case entails the accomplishment of a drone registration workflow that would enable legal domestic experimentation assuming their contribution to reduced-emission mobility. One insight was that niche drone experiments with high public value would undeniably increase external pressures on operational departments, and the other was that registration of drones was perceived as an obstacle by one operational department but was achievable for another operational department. The vignettes demonstrate the different bundles of activities (Table 4). We interpret their performative value in terms of cognitive and relational scaffolding taking changes or additions in the narrative around drones circulating within the ecosystem as cues. Notably, we only present narratives related to the activities of the explorers. Other narratives about drones may circulate within the organisation, the professional field or the public audience, which are not part of this case study. As practice research inevitably starts observing in the middle, even if new practices are developing, the vignette captures the accomplishment of

the small but substantial step of drone registration in the transition of imaginations around a niche technology into a regime with the potential to develop further.

4.4.1 Pull to Order as an Indication of Discomfort

A turning point in the developments around drones was the Gatwick airport incident in 2018. The airport shut down for more than a day after drone sightings causing major disruptions in the flight schemes, huge costs and extensive investigations. The technological innovation to prevent incidents was swiftly picked up by industry. Adjustments to regulations and policies and consequential adjustments to governance structures were regarded to be within the explorers' sphere of influence. Nevertheless, they anticipated that the process would not be straightforward, given that the prevailing practices in policy and aviation at the time were oriented towards the continued support of the dominant regime in commercial aviation (pull to order). Drones were considered risky and inconvenient intruders in air space despite numerous examples of useful applications of drones in society.

Sometime later, the explorers picked up signals about a stagnating dialogue between drone professionals and operational departments about opportunity to experiments. Professionals seeking to expand experimentation (pulling to potentiality) expressed concern about the superfluous ambiguity and complexity of procedures, while operational departments contended that experimentation was sufficiently facilitated by existing dispensation procedures (pulling to order). Meanwhile, new EU law for unmanned aircraft was being developed with which national policies needed to comply. This law would enforce different regulations for different classifications of drones. Anticipating a subsequent need for registration, the explorers saw this moment as a potential catalyst for change in the bigger picture of future mobility practices being smart, sustainable and climate-adaptive. Below we explain the mechanisms that instigated and sustained the drone registration journey. We illustrate the emic viewpoint of the explorers with vignettes written in a plural present tone of voice and interspersed with translated quotes.

4.4.2 Cognitive Scaffolding: Envisioning Alternative Futures

Moving alternative futures up in the organisational hierarchy served as *cognitive scaffolding* activating a mechanism of *envisioning* alternative futures that break away from current practices. Reports envisioned how drones may eventually be omnipresent in society turning upside down the current world of perpetuated common practices and outlined several moves forward. While picked up by professionals in the field, operational actors were reluctant to change procedures. Vignette 6 shows how the promissory future of drones in mobility was mobilised to gain legitimacy for acting.

Vignette 6 - Drones as a novel mode in an integral mobility approach

In the drones journey it is not new technology that the explorers pick up as a signal of change, but the increasing number of incidents that call for action to organise experimentation instead of allowing for uncontrolled growth. They also pick up complaints from experimenters in the field about current constraining regulations. They use available images of alternative futures in which drones serve public values to direct actionability: *"... the minister had sent a letter to parliament telling how to set up the drone world. It mentioned four categories of attractive futures. These had to do with maintenance and inspections, smart farming, with good counter drone facilities. [...] Mobility was also part of it. So smart logistics, that's delivery of packages, and we really started looking into that: what's involved, which parties. [Such a message from the minister] helps me to show the commitment of our ministry to the direction we will follow. That is a really important element."* The explorers are involved in exploring new mobility frames around drone applications. Hence, they carry the envisioned alternative futures within their repertory of knowledge and know-how. Although they realise that drones are not yet CO₂-neutral, they see their potential to break away from current patterns in mobility practices that perpetuate a focus on road mobility. They regard this potentiality to be in line with drivers of change such as 'integral mobility' and 'cross-modal cooperation' that are to be adopted by the organisation. Such drivers prompt them to look beyond obvious stakeholders in the drones system and attempt to propel their potential for a breakthrough in the stagnated dialogue between drone professionals and operational departments. Together with specific stakeholders, they concretise how such drivers may work out to help them understand how their playing field is widening. Through envisioning alternative futures, they try to engage others in working towards the same sustainability goals.

The explorers found a mandate to operate in the formal political agenda that advocated for domestic experimental space to explore and learn about economic and societal use for drones. The 'attractive futures' for drones we saw in documents, tied together ideas about sustainable integral mobility futures with possible novel solutions that may contribute to achieving associated goals. The explorers drew on such documents and the ministerial letter in conversing with operational actors to underscore the legitimacy to act. Political approval signalled that action on the operational level was required. Announcing specific areas for experimentation suggests a pressuring call to action. While serving as a wake-up call creating awareness *that* things could be done differently, it did not prompt immediate action on the side of operational actors to streamline the application procedures for experimenting.

The operational departments asserted that experimentation was feasible if drone companies appropriately adhered to the application procedure for exemption.

4.4.3 Cognitive Scaffolding: Concretising Emergent Futures

The dominant narrative circulating in aviation contested the need for drones to sprawl in the mobility system. The narrative of 'drones as dangerous invaders of commercial airspace' continued hampering proactively loosening and simplifying regulations for experimenting, which induced another kind of cognitive scaffolding. While formulating envisioned ideas on paper can appear rather abstract and may not create significant pressure on the organisation to instigate change, field experiments render such abstract images into concrete alternative futures as shown in Vignette 7.

4

Vignette 7 - Drones as dangerous invaders of commercial airspace: 'You are not allowed to experiment, unless...'

Despite political support for experimenting with drone applications, the narrative around drones within the organisation is dominated by safety and security issues grounded in reports about incidents and potential harm. National policies in aviation tend to restrict experimentation with drones. The explorers are in close contact with professional parties that conduct relevant niche experiments. They hear from the field that experimenting has become a harsh, time-consuming business, which induces them to intervene. They listen carefully and learn about the obstacles drone providers face and about the potential for the public value of their niche experiments. "... [that was] a passionate employee, who had always believed in such scans by drones and the added value for society. It was hard to gain a foothold because of risk aversion within our organisation. By having a large party like X talk to the organisation, you create leverage, so that parties wonder: can we still explain to society that we stopped it, because we can do so many good things with it? And how do you find the balance between sustainability and safety?" The explorers are aware that such niche experiments increase the pressure for change from the field, especially since spin-offs start taking the knowledge developed at national universities with good track records abroad, where the rules are more relaxed. Actors in the field complain to them about not being supported by the operational departments that sustain existing procedures and regulations. The explorers use these stories from the field to build up external pressure on the operational departments, but we also sense in conversations with operational actors that they are struggling due to a lack of capacity and competencies, not because of unwillingness. They attempt to open up the discussion about experienced tensions by intervening with more holistic views on integral air mobility and thinking in opportunities rather than problems and single stakeholders' interests.

While the explorers had seeded attractive drone narratives into the current system supported by the minister's letter, the increasing number of incidents with drones related to commercial aviation reinforced the dominant narrative around drones in the existing regime. The explorers interpreted this as momentum to move on. To nurture the envisioned drones futures, the explorers used exemplars of experimenting field professionals to increase the pressure for change. Showing how niche experiments could contribute to public value urged operational actors to align their perceptions of the future. A clear delineation of alternative courses of action revealed a multitude of avenues for the organisation's pursuit of a smart, sustainable, circular, and climate-adaptive mobility system.

The explorers leveraged developments in the field to increase the pressure in the system as *cognitive scaffolding* for others to align their thinking and acting through the mechanism of *concretising* such envisioned futures. The explorers' continuous efforts to support the professionals' eagerness to experiment and to connect them with operational departments and other parties in well-connected ecosystems had performative value. Operational actors could hardly neglect their actions, but that did not lead to activity as indicated by the departmental reluctance to register drones. Knowing what can change does not automatically instigate action. The concrete alternative futures reflected by the field experiments simultaneously surfaced the tensions between current and new practices. From the above, we understand that *cognitive scaffolding* alone is insufficient to instigate alternative courses of action yet contributes substantively to aligning actors' perceptions of the future towards alternative possibilities. Cognitive scaffolding aims to pull to potentiality by showing possibilities and building up pressure to generate the tension necessary to invoke change.

Recognising a struggling operational department concerning the organisation of future practices within present constraints was a turning point in the drones journey. Supported by momentum from the EU's announcement of new directives, scaffolding was erected from a relational perspective. This differs from cognitive scaffolding not so much in directionality, as that remained future-oriented, but in intention. Instead of pulling to potentiality, it supported actors to resist the pull to order by the operational system.

4.4.5 Relational Scaffolding: Confronting Concerns

A large part of the explorers' daily practice involves engaging in conversations with actors in the field and within their organisation. By doing so they functioned as brokers carrying and distributing information across departments and within the mobility system. However, there was more to it than merely connecting relevant

content. Their engagement with others enabled them to build strong yet loosely coupled relationships with many actors in the system. Vignette 8 shows how these strong ties enabled them to sense what was 'alive' in the system.

Vignette 8 - Drone experiments under EU directives: 'You can experiment, provided that...'

The explorers' efforts to adapt national policies and regulations find support in changing EU regulations that are less strict, for the most common and widespread category of drones. In the context of enforcement, this means that registration of drones becomes a necessity. This awareness combined with recognising that a large number of 'hobby' and professional drones need to be registered, leads the explorers to suspect a current competence gap for resolving this issue at primary responsible operational Department X. Having a career history at Organisation Y, one of them reasons that Organisation Y is equipped to do so, based on similar practices but for another modality: *"I felt that Department X had a problem with that because they did not yet have the necessary numbers of employees or the procedures to handle the expected large numbers of applications. For example, it would be quite a challenge to handle many consumer contacts using call centres and websites. At Organisation Y they were much more experienced with these matters."* Realising that the capacity and competence gap of Department X might be closed by Organisation Y, they plan regular meetings with the various stakeholders. It turns out that their feeling about Department X's reluctance to change is correct. They do struggle with how to organise and coordinate a large number of applications from private owners as their current procedures and resources are geared for highly specialised technical applications. They lack the capacity and the appropriate facilities for the new task. The explorers propose to allocate the registration of drones to another operational organisation, which provides concrete perspectives to move forward. The subsequent trajectory is not without its problems though. It requires establishing new organising structures and adjustment of policy and legislation to preserve who is responsible for what. This requires following existing hierarchically structured procedures. This enhances the trustworthiness of the process, which enables those involved to have the changes accomplished by the time EU legislation becomes effective.

The vignette shows how organisational structures enable operational departments to operate but also restrict them in seeing alternative possibilities. It took the explorers' agentic behaviour to deviate from established practices and responsibilities. During meetings in which the explorers spent time brokering between various stakeholders, they engage in *relational scaffolding* invoking a mechanism of *confronting* concerns instead of trivialising them. In the interactions between the explorers and the operational departments, dispersed knowledge was combined into the unusual proposal to allocate the registration of drones to a less obvious operational department currently not involved in flying vehicles. This proposal gave actors a concrete perspective to further explore new drone practices in a controlled experimental space, framed by rules and guidelines and monitored by registration. Concomitantly, the proposal raised challenges to overcome, both practically and psychologically. Persisting emotional discomfort related to the uncertainty about where this would all lead was contained through relational scaffolding, particularly by one explorer who previously worked at the department taking on the new task. The practical wisdom this explorer carried with him both content-wise – knowing what the task entailed – and relational – emotional bonding with previous colleagues – enhanced the trustworthiness of this perspective. This supported involved actors to overcome obstacles. Obstacles manifested themselves in the form of practical, political and legal concerns and represent the operational system's pull to order. For instance, thinking within siloed departmental possibilities prevented them from seeing this liberating proposal in the first place. To overcome such obstacles the explorers applied a mindset of thinking in terms of opportunities rather than problems, and an integrated approach to mobility as opposed to the silos of modalities. This attitude empowered them to suggest the cross-modal cooperation option that had not yet emerged in previous conversations between actors immersed in siloed practices and reasoning from taken-for granted interests. While this opportunity approach pulled most operational actors on board, still some discomfort remained on management levels.

4.4.6 Relational Scaffolding: Containing Discomfort

Having the knowledgeable actors on board who had the know-how of how to operate was one thing, gaining support from managerial levels was another. As managers carry the final responsibility to successfully accomplish the transformation, they feel the burden for detrimental risks. Recognising this, caused the explorers to engage in further relational scaffolding practices invoking a mechanism of *containing discomfort* as illuminated in Vignette 9.

Vignette 9 - Drone registration: the bigger picture

Taking on the new registration task is not without risk for Organisation Y. The explorers put effort in containing the associated discomfort. They mobilise their knowledge of innovation processes expressing that innovation takes time and is a continuous process, which helps to provide the big picture to management. It also helps that they have built a track record in the organisation that demonstrates their reliability and that they come alongside rather than barge in as some kind of 'superior consultants'. They also enrich the narrative by comparing drones with recognisable past experiences, such as the introduction of cars to the general public: *"[I reminded management that] innovation does not stop with the introduction of new technology. Cars have improved over time and become much safer. Organisations for quality control in the sector have developed over the years. This is still in its infancy for drones."* With these comparisons, the explorers try to reassure Organisation Y's management. The strict adherence to the formal procedure, which is a prerequisite for any change in legislation, is also instrumental in fostering confidence in the process among all stakeholders. For this, they also deliver a solid business case and attractive projections for the future.

This vignette shows the *relational scaffolding* practices that support actors to endure the discomfort brought about by taking on the new task of drone registration which was accompanied by many uncertainties. While registration regulated the proliferation of experiments, how drone applications would scale up remained unforeseeable. Prevailing ideas about drones were emphasising their use for public benefits. The airspace system was still very much geared towards traditional aviation and lobbying incumbents tended to pull to order. The occurrence of drone incidents highlighted a number of new issues, including the importance of ensuring safety on the ground rather than commonly in the air.

Against this backdrop, the explorers engaged in relational scaffolding practices *containing discomfort* expressed by management. For instance, by zooming out to the bigger picture in which drone registration takes place the explorers move to a more abstract, less threatening level. Also, referring to safety aspects is not a random choice but attuned to the operational department to adopt the drone registration practice. Having general expertise in innovation-change processes and broad knowledge of the mobility domain, the explorers conjured up specific analogies relevant to the situation at hand. In this case, guaranteeing safety is part of the department's identity immanent in their daily practices. Therefore, the explorers pointed out that new

innovations lack established institutions, such as interest associations that emanate quality assurance. In the case of cars, for instance, such developments have evolved over many years. Stressing equivalent values enabled the operational department's management to relate the emerging drones regime to their own situation. The vignette also mentions a solid business case as part of the procedure to illustrate the importance of demonstrating the benefits of drones in relation to overarching organisational objectives for a smart, sustainable system. While a focus on calculated benefits meets the needs of actors susceptible to operational pull to order to conduct with confidence, it instigates contestation as well. Even robust research on cost-benefit analysis comes with contestable uncertainties and assumptions, which various stakeholders may interpret differently. By setting clear boundary conditions, the explorers aim to establish trust among involved parties.

The above highlights that the explorers *use* tensions to facilitate dialogue instead of resolving or ignoring them. While tension emerges from the uncertainty and not knowing what proper conduct around drone developments is, resolving this tension by complexity reductive approaches is not helpful to navigate complex situations. The drone registration journey shows how psychological discomfort can be contained through relational scaffolding, which helps stakeholders build a basis of trust and cohesion. This enabled actors to confront the more practical level of 'doings' and remove obstacles that hindered alternative future imaginations to move forward into concrete action, without falling back into known comfortable institutions and practices.

4.4.7 Harvesting Compelling Narratives

While engaging in relational and cognitive scaffolding practices, narrative arguments merged into a compelling narrative endorsed by the involved stakeholders' participation. This narrative was not prefabricated to convince stakeholders to join forces and bring the transformation into being. On the contrary, the narrative and even the goal of establishing drone registration emerged during conversations with various parties to understand what was 'alive' within the ecosystem that might prevent the development of drone applications. The explorers' legitimacy to act came from the potential of such applications to contribute to emission-reducing mobility and reducing traffic congestion without the need for the construction of new physical infrastructure.

The explorers played a prominent role in harvesting the narrative arguments, which stitched together formed the compelling narrative that attracted the parties who together managed to take the next step in the drone journey. Had the explorers not built strong relationships in the field, they would not have picked up the challenges

experimenters encountered. Without being practically knowledgeable explorers curious for changes impacting the organisation and the larger mobility system, they would not have valued the importance of drone registration. Finally, without strong relationships across operational departments within their organisation, they would not have sensed the main obstacles for drone registration. The explorers realised that crafting stories is part of their practice: “You make narratives, which makes it sound logical [...] to do it because it really adds value to society. That narrative is there, the basic line. You just have to glue it together. That is really something that, in my opinion, is an art. I can't say that of myself, of course, but do you understand?”. The explorer emphasises here that stories are not made up to convince others but are harvested from their interactions in the network of actors and ideas. In hindsight, the harvested narrative provided a logic for why an odd task would fit into Department Y's portfolio with respect to possible future developments, like “an offer they can't refuse”.

While the final narrative was compelling enough to eventually bind diverse parties together to achieve what grew on them as a next meaningful step in drone development – drone registration –, its content and implications were often contested as it emerged. For instance, being flying objects drones were unarguably considered the domain of parties that controlled aviation infrastructure. The drone registration proposal suggested these parties to allow an uncommon department to operate within ‘their’ domain. This required not only cognitive scaffolding to support imagining the ‘unthinkable’ alternative road ahead, but also relational scaffolding to render the whole ecosystem supportive of this proposal without fully knowing its consequences.

Vignette 10 - Drones as a catalyst for integral mobility: an attractive perspective for its future director

In the end the harvested compelling narrative of the drone registration journey revolves around Organisation Y adopting a new identity enacting the emerging cross-departmental collaboration. The narrative entices prospective views on integral mobility and a central public role for Organisation Y, which conveys an innovative image towards young prospects. It suggests that travellers in the future will seamlessly switch between different vehicles, such as flying cars, autonomous vehicles or light electric vehicles, through mobility-as-a-service solutions. The narrative addresses concerns by substantiating the safety aspects of drone development, as the explorers recognise that this value is linked to the current identity of Organisation Y. Safety is generally a highly valued aspect of mobility for PublicOrg. The narrative emphasises cross-departmental collaboration as current boundaries will more or less vanish in an integral mobility future.

Instead of brushing objections aside, the explorers used them to adjust the narrative until it was perceived as the logical way forward. Construing the narrative together helped gain commitment as the narrative contained an attractive part for all involved. To the newly involved department, it offered an attractive perspective for the future identity of becoming the integral mobility director, it was suggested to attract young prospects and it matched with current values like safety. For the other operational department, it offered relief from a burdening task and for drone applicants in the professional field it resulted in clear and acceptable procedures and policies.

The explorers also engaged in relational scaffolding practices to mobilise support within the ecosystem for alternative courses of action. Influential operational departments, scientists, top officials and international parties in the network were mobilised to endorse the narrative from different perspectives. For instance, the financially strong party experimenting with infrastructure inspection was used to impose external pressure. Similar to the minister's letter, such relational support by authoritative powers offered legitimacy to act.

Further confidence for taking action was increased by specifying the boundary conditions of the narrative. The explorers were aware that the value of the narrative has temporal and contextual limitations, as this registration solution works for one category of drones flying in visual range and development continues. By 'telling the honest story', the explorers gained trust in their aptitude to act. It also invited those involved to imagine further alternative courses of action. For example, the drone trajectory instigated an exploration into a new narrative revolving around 'test-and experimentation space for all aviation' and also a more integral perspective on 'air mobility' emerged that breaks away from the traditional view associated with 'aviation'.

Both cognitive and relational scaffolding were essential to the emergence of the compelling narrative for, without it, operational actors would have likely continued to operate within their silos. Harvesting the compelling drones narrative invoked the successful alignment of operational actors with novelty and ideas about future mobility practices, which enabled them to move forward. The narrative was not invented by the explorers but emerged from the interactions in which they engaged. As there was no intention to harvest any particular narrative, it reflects the ongoing interactions between the explorers and other actors and their evolving perceptions of the future. The harvested compelling narrative opened up alternative courses of action towards an integral mobility future in which drones are a new socio-technical regime.

4.4.8 Theorising from Findings

Empirically, the cognitive and relational scaffolding practices were more entangled with one another and with contextual realities in situated activities involving various actors than the unravelled practices presented above. Over time, explorers combined situational cues about what was 'alive' in the system with experience and know-how about workable solutions into an aspirational alternative course of action. They poised the system with surprising ideas to invoke responses, such as hosting round table conversations or an unusual solution for drone registration, while being empathically responsive to what their actions brought about emotionally and substantively and adjusting action accordingly.

We see this relational dimension in their scaffolding practices as the foundation for cognitive scaffolding required to align for alternative courses of action. Actors bring multiple experiences, perspectives and expectations to the stage, from which dilemmas arise based on significant differences. From an inquisitive perspective on future-making, how such dilemmas are resolved matters to how the future unfolds (Whyte et al., 2022). Building on a processual ontology that considers the world as being in a constant state of becoming, resolving does not mean to identify and implement a solution, but to choose a side of the dilemma to start moving in a direction, even though it might never get there (Nayak & Chia, 2011). Whether or not such ongoing change becomes transformative in the long run depends on how actors respond to dilemmas emerging over time and is influenced by the agentic ability to deviate from habitual practice in the ongoing present (Hernes & Obstfeld, 2022).

To understand how the unfolding present in our case was entwined with the explorers' emic viewpoint of dwelling within the system (Chia & Holt, 2006) yet with deliberate intent to change (Jarzabkowski, Lê, et al., 2019), we present the unfolding present timespace, visualised in Figure 11 as lines of unrealised potentials that manifest where they interact in the present. As visualising movement on a flat surface is challenging, we picked the most relevant instances for theorising the unfolding change process in the drones journey (Figure 11, TS 1-6). As the future unfolds along these 'present states', the emic explorers' viewpoint changes as well. Below we describe this change process and explain how we interpret Figure 11.

The emic viewpoint of the explorers is represented by the green line in T1-5, which represents the traces in the past that they carry as experience and know-how. At T6 the explorers quit their intentional efforts, therefore the green line dissolves. The grey lines are unrealised future potentials interacting as situational cues in the present, which can conjure up alternative courses of action. The orange lines

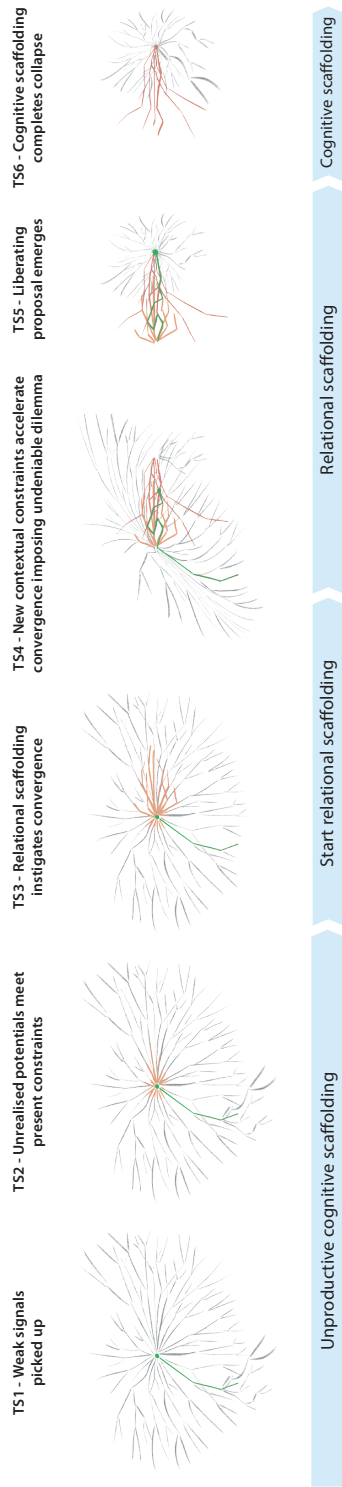


Figure 11 - A relational perspective on scaffolding dynamics

depict other actors' continued timelines as they emerge from intersecting with the explorers' timeline and unrealised potentials. These responsive actions shape the transformation without prior-defined goals yet are influenced by intentional efforts of the explorers to generate significant difference to invoke change – e.g., bringing actors with diverse interests around the table or introducing provocative mobility futures into present mobility practice. The red lines, starting to emerge at T4, depict timelines of other actors being attracted by emerging possibilities. This means that the difference between the orange and red lines at T4 and 5 represents an ongoing phase shift, which is completed and turned into a collapse at T6.

The sequence of chosen 'present moments' (T1-6) represent how actors, including the explorers, work through several arising dilemmas in the drone ecosystem – i.e., actors involved in establishing the new sociotechnical regime – rather than recurrent stages in a process. Dilemmas are context-specific depending on who and what is involved in ongoing situated activities. There are four main parties involved: the explorers deliberately seeking to transform current mobility practices, Department X facing the emergence of drone experimenters in a traditional airspace field, the field experimenters desiring to experiment with minimal administrative hassle exemplified by an authoritative experimenter with strong ties to PublicOrg and Organisation Y with a history in registering large amounts of vehicles, but not currently a player in the airspace domain.

TS1 - Weak Signals Picked up

The first dilemma arose as the explorers juxtapose picked up signals of incidents between drones and traditional aviation with complaining drone experimenters planning to go abroad – Figure 11-TS1 the small thicket of grey lines at the start of the green history line. At the time, two contradicting narrative arguments circled in the system. Traditional parties regarding 'drones as dangerous invaders of commercial airspace' dominate within the system, leading to strict rules for experimenting. On the other hand, the narrative argument of 'drones as a novel mode in an integral mobility approach' derived from a ministerial letter to parliament invigorates the explorers' mandate to connect field opportunities with organisational activities. The letter envisioning alternative futures in four domains aims to generate urgency and provides legitimacy to act. The explorers recognise the limited effect of the cognitive scaffolding produced by the envisioned alternative futures in the letter, and simultaneously the considerable pull to order by traditional parties. Addressing the opposing forces in the mobility field directly is beyond the explorers' circle of influence. Sensing discomfort within their organisation in response to these opposing forces, however, makes them assume the role of interveners.

TS2 - Unrealised Potentials Meet Present Constraints

The second dilemma arose during faltering attempts to contain discomfort by bringing field experimenters and operational departments together to reconcile their different perceptions of the future. While entrepreneurial experimenters saw rules and regulations as a barrier to expanding experimentation with drones, operational departments contested the need for new procedures emphasising potential safety issues when loosening the rules. Lord et al. (2015) explain from a quantum approach to time how unrealised potentials when approaching the present meet interacting constraints on multiple levels ranging from individual to organisational systems. We see here group-level arguments of the entrepreneurs opposing with systems-level arguments of the operational departments. Cognitive scaffolding along content lines, as implied by seeking legitimacy from envisioned alternative futures in the ministerial letter, proves insufficient to resolve the dilemma around opening up strictly regulated experimentation. Parties maintain their prefigured perceptions of appropriate courses of action for the future acting accordingly, continuing separate paths into the future, visualised as orange lines in Figure 11.

TS3 - Relational Scaffolding Instigates Convergence

As the dominant narrative argument in the system remains considering drones as dangerous and experimenting is approached negatively – ‘not allowed, unless’ – tactics are changed. Still focussing on positive framings for envisioned futures, cognitive scaffolding is supported by relational scaffolding. One orange line in Figure 11-TS3 represents an authoritative experimenter with strong ties to the operational department functioning as cognitive and relational scaffolding. Concretising emergent futures of drones inspecting infrastructure works involved calculating its benefits, which enabled operational actors to weigh the positive and negative impact of drones, even though based on assumptions and modelling. While Beckert & Bronk (2019) explain how calculative devices produce fictional expectations, such expectations are generally perceived as more robust, particularly if they come from powerful authorities. The relational aspect of scaffolding bears on this particular experimenting organisation being such an authority affiliated with PublicOrg, which puts more weight into the trade-off. This affiliation served as relational scaffolding to pressure the operational system reluctant to change to align their perceptions of the future. However, movement in the deadlock around experimentation facilities failed to materialise. Other parallel orange lines in Figure 11-TS3 depict ongoing interactions between operational departments and the explorers through which they sensed concerns of a rather practical nature at play. Hence, they argued it cannot be unwillingness that imposes the reluctance

to change procedures. Through repeated formal and informal interactions, the explorers gain enough trust to elicit the main obstacles.

TS4 - New Contextual Constraints Accelerate Convergence by Imposing Undeniable Dilemma

The third dilemma arises as the insistent explorers continue querying various stakeholders to learn what is 'alive' in the ecosystem – the green zigzag line in Figure 11-TS4. These empathic relational scaffolding practices built mutual trust, which allowed a key dilemma to surface: drone registration was imperative due to forthcoming EU directives, yet problematic for Department X. The narrative argument of 'drone experiments under EU directives' foreshadows a more positive approach that allows the field to 'experiment provided that' among others drones are registered. Eventually, national legislation must follow EU directives – in Figure 11-TS4 the small thicket of grey lines on the right. This poses an undeniable dilemma in need of reconfiguring organisational structures. For Department X this would be an immense undertaking. On the other hand, the mandatory nature of the directive proved helpful in accepting an unusual proposal, which accelerated the convergence of activities – Figure 11-TS4 red lines.

TS5 - Liberating Proposal Emerges

The liberation of the dilemma came from an unexpected angle based on strong ties and know-how one explorer possessed from prior work relationships with Organisation Y. The explorer recognised that Organisation Y was equipped to handle the large amounts of expected drone registrations as it had comparable procedures in other mobility domains. This liberating change of perspective altered the interaction patterns and enabled converging towards a shared objective – the green dot in Figure 11-TS5. Note how the challenge changes at this point, becoming less complex yet still complicated as interaction patterns converge towards a 'shared' emerging future. As the future becomes more concrete and the direction of movement more aligned and knowable, other practices are required for purposeful action (Kurtz & Snowden, 2003; Poli, 2013; Snowden & Rancati, 2021). At this point, appointing appropriate experts to determine what is needed in terms of practical, legal and organisational aspects and to outline a series of actions and oversee their implementation might seem a straightforward process. However, given the need of change in legislation this was a delicate process raising new concerns and dilemmas that needed to be confronted. In parallel, on managerial levels emotional discomfort related to uncertainty about future consequences needed containment. Both practical concerns and emotional discomfort were supported by relational scaffolding practices. The explorers confronted concerns by

following formal hierarchical routes without improvising, which enabled involved parties to gain confidence in the proposed approach. Building on established relationships and the know-how of involved operational actors, this route became a collaborative endeavour gradually enabling actors to transcend habitual practices. Further relational scaffolding practices involved containing discomfort due to potential detrimental risk issued by responsible management. The narrative of 'Drone registration: the bigger picture', as explained in Vignette 9, helped to endure the discomfort associated with potential detrimental risks for Organisation Y. The explorers related the unique proposal to the organisation's existing values, an attractive future identity and analogies with familiar innovative trajectories, which enabled management to embrace the proposal as liberating from deadlock. Such narratives reduce the perceived unfamiliarity as explained by Rindova & Martins's (2022) theoretical futurescapes framework built on Ricoeur's narrative theory using the concept of temporal translation. Our empirical data shows how temporal reorganisation helps contain deep-felt discomfort related to uncertainty about future developments when futures have become concrete enough to be enacted.

TS6 - Cognitive Scaffolding Completes Collapse

The clarity about a shared objective enabled collaborating actors to align their diverse perspectives and capacities, strengthening the path to convergence. The objective of establishing the new drone registration process served as cognitive scaffolding enabling parties that become involved along the way to transcend their siloed thinking and acting patterns. At this stage, the set goal – drone registration – had become non-negotiable and solutions were only enacted in as much as they contributed to achieving this goal. Hence, the process has changed from an effectuation-based to a causation-based approach (Sarasvathy, 2001). When all actors were on board and the new registration procedures were effective, convergence turns into a collapse completing the transformation. This novel situation of new rules and practices for further experimentation was attractive to field parties. The explorers however raise awareness that such a transformation was temporary, and the new rules and regulations had boundary conditions in terms of time and context. As the field evolves different dilemmas would emerge that need confronting. In this case, the rules applied to specific kinds of drones and operations within visible sight, which will likely need to expand in the future.

4.5 Discussion

We set out to investigate how actors shape the interplay between emerging alternative futures and present realities. Drawing on the concept of scaffolding from knowing in practice (Orlikowski, 2006), we interpreted the activities actors engaged in as cognitive and relational scaffolding practices, unlocking how such practices contribute to future-making. Understanding these scaffolding practices is important for organising and coordinating transformative change in the context of complex grand challenges and an open-ended view of the future. Our research has implications for theory on scaffolding practices and future-making practices in the context of grand challenges. First, we introduce the notion of relational scaffolding as a prerequisite to emergent cognitive scaffolding. Second, by highlighting the role of harvesting of narrative arguments through interaction in situated activities, we shift future-making perspectives from narrating visions and pathways that emphasises political processes of persuasion (Dalpiaz & Di Stefano, 2018; Kornberger, 2013; Rindova & Martins, 2021, 2022) to cultivating awareness. With these two contributions, we complement the understanding of future-making and scaffolding practices that usually focuses on people's cognitive abilities to adopting novelty, with a relational perspective. Next, we first present our process model that synthesises these findings. It shows how the interplay between imagined alternative futures instigated by weak signals and alternative courses of action in the present is shaped through scaffolding practices.

4.5.1 A Process Model of Relational Scaffolding as a Foundation for Cognitive Scaffolding

In line with a robust action approach (Ferraro et al., 2015), previous research has advocated the use of persuasive desirable future imaginations as multi-vocal inscriptions that guide current action through future-perfect thinking (Fuglsang & Mattsson, 2011; Pitsis et al., 2003; Winch & Kreiner, 2011), convincing vision development (Berenskoetter, 2011; Costanza & Kubiszewski, 2014; Harmon et al., 2023; Kantabutra, 2020; O'Connell et al., 2011) and co-creating forward (Sharma et al., 2022). This research emphasises the need of cognitive alignment of diverse actors to instigate change. Scholars have also emphasised how organisations temper prospective ambitions through calculation and productive imagination (Beckert & Bronk, 2019; Rindova & Martins, 2022). We argue that by retrospectively analysing completed missions, such views inadvertently convey linearity in future-making. While scholars attribute non-linearity and temporal variation to pathways, such success stories perpetuate the illusion that actors and organisations can consciously manage the outcome of complex challenges, which is highly

questionable (Nayak & Chia, 2011). We contend that such accounts downplay the complexity in which actors find themselves during the process. Hence, our focus is on the challenges and dilemmas that actors encounter.

Our conceptualisation of the actors' practices and activities in terms of cognitive and relational scaffolding offers a more nuanced understanding of the use of possible alternative futures in ongoing organisational future-making practices from a perspective 'within' the complex flow of ongoing situated experiences (Fachin & Langley, 2018; Golden-Biddle, 2020). The findings reveal that the persuasive cognitive route – i.e., concretising possible alternative future imaginations – is insufficient to invoke concerted action towards sustainable futures. Previous research has shown how cultural and material scaffolding practices support such concretisation pathways through imaginative framing and concrete infrastructures that allow actors to learn about and adopt novelty in entrepreneurial environments (Casasnovas & Ferraro, 2022). Yet, circumstances of bending practices in established organisations, induce high levels of uncertainty-related discomfort that need to be contained. Focusing on established organisations' change efforts, our findings further nuance this view by revealing relational scaffolding practices that address profound feelings of discomfort and concrete concerns on a practical level allowing operational actors to endure. We argue that a relational basis offers grounding for building such cognitive cultural and material structures. This is particularly relevant in established environments where pull-to-order forces are typically fierce in resisting change.

We present a process model of scaffolding between emerging alternative futures and transformative courses of action (Figure 12). This model demonstrates how deep-felt discomfort and practical concerns are cared for while concretising imagined alternative futures involving different parties.

Our model starts from monitoring weak signals in society, such as technological novelty or social innovations, that indicate potential change and possible perturbation of the current regime in which an organisation operates. Such weak signals warn about environmental changes to anticipate and offer leads to possible alternative futures that may invoke transformative change. Scaffolding practices support proactively addressing weak signals and discovering possible directions of transformative change (Mair et al., 2016). This starts a process gaining concreteness over time as represented by the horizontal wave in the model but requires multiple iterations of relational and cognitive scaffolding.

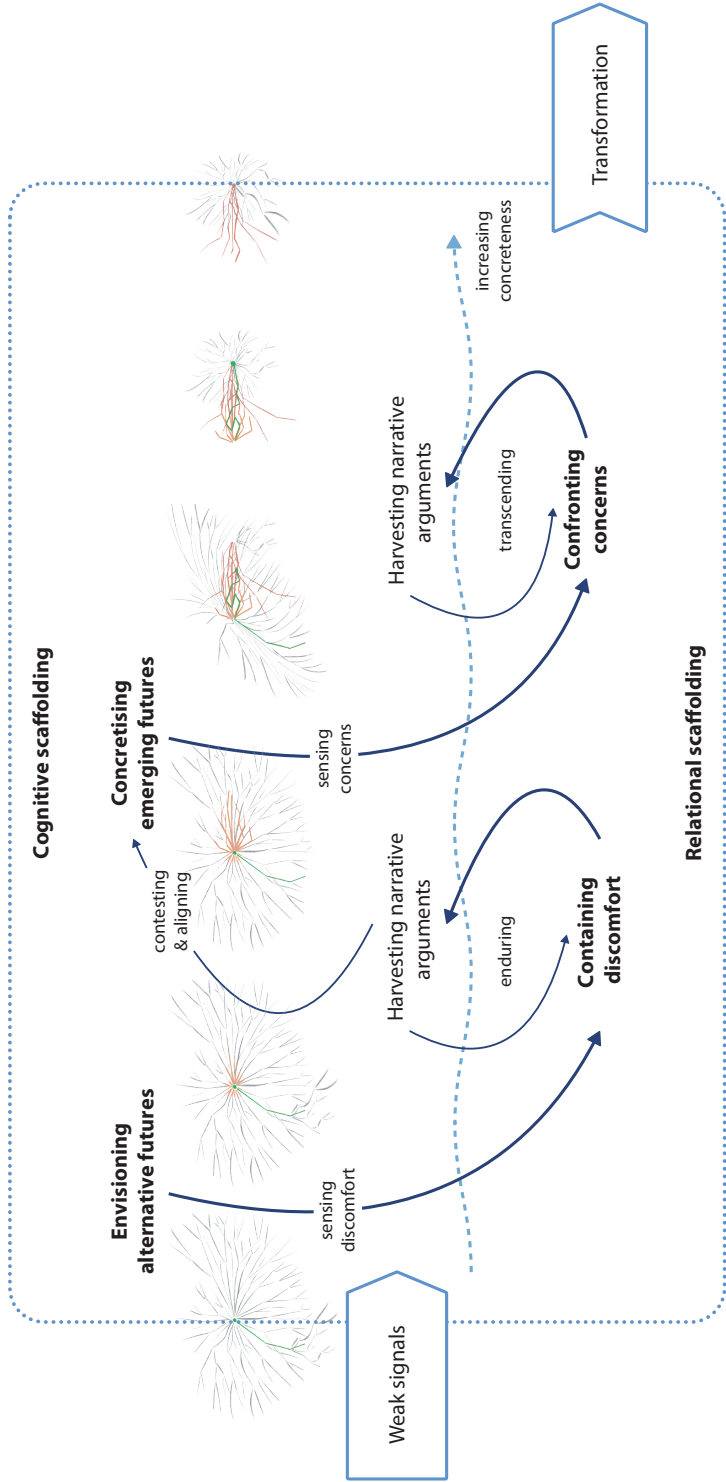


Figure 12 - Relational and cognitive scaffolding model

Cognitive and relational scaffolding emerges in the interaction between actors who move back and forth between experimenters or entrepreneurs pulling towards potentiality and organisations or departments pulling towards order. During this scaffolding, narrative arguments are harvested that connect imagined futures with daily future-making practice. Above the wave in Figure 12, envisioned alternative futures – e.g., drones as zero-emission mobility – serve as cognitive scaffolding, allowing contestation and alignment along content lines of opportunity. In the early stages, scaffolding supports agenda-setting and getting others on board. When abstract future imaginations become concrete enough for experimentation, partners are sought in the field to explore further how developing concrete emerging futures can bring about change in a system, such as in our case the mobility system – e.g., drone inspections of infrastructural works. Relational scaffolding practices develop simultaneously containing the discomfort invoked and confronting practical, political and legal concerns. Discomfort typically involves reputational risks while practical concerns relate to obstacles that tend to stifle relationships between involved parties. Containing discomfort in the drones case surfaced narratives relating to novel identities and past analogies that were part of the explorers' repertory due to previously built strong ties and know-how. Concerns on a more practical level required an empathic understanding of different siloed perspectives, transcending oppositions and combining practical knowing to establish 'doable' courses of action.

Concretising envisioned and emerging futures demonstrates how things can be done differently to stakeholders who need to be involved to make things possible, for instance guarders of public safety and security. However, introducing novelty into an existing system generates tensions among actors as it tends to raise discomfort on emotional and practical levels. Going against the grain is a hassle that requires agentic effort to withstand pull-to-order forces within the system. This necessitates that actors trust the change process as it evolves despite the outcome being unclear and uncertain. The discomfort that this uncertainty may invoke can vary from deep-felt emotions related to opening up convictions and beliefs reflected in habitual practices to more concrete practical concerns about how to make things operational. To get others on board, as in our case the operational departments to simplify experimentation procedures, relational scaffolding can help by exploiting trust relationships previously built and taking their concerns and discomfort seriously. Relational scaffolding practices address such variations by containing deep-felt discomfort that often occurs at managerial levels accountable for the risk, and confronting the more practical concerns with operational actors.

Relational scaffolding practices, as depicted below the wave in Figure 12, engage with the tensions rather than brushing them away. Containing deep-felt discomfort about uncertain outcomes of transformative change helps endure associated emotional discomfort while confronting concerns about how to organise things, legal matters and other practicalities helps to transcend action patterns confined to 'current ways of working'. This is why the explorers, as advocates of the pull to potentiality in our case, intervened by opening multiple interaction pathways with various actors simultaneously. These pathways, reflected in the background artwork in Figure 12, involved relational scaffolding to build trust and cohesion while sensing leverageable energy, and cognitive scaffolding to achieve alignment along content lines while allowing for contestation.

Dominant values and beliefs undergirding existing practices often hamper concrete concerted action as exemplified by the aviation domain's perception of drones as 'threatening invaders of airspace' and the operational departments' reluctance to act differently or change the rules. As our case shows such reluctance is not only due to lobby practice of incumbents having other than safety interests in preventing drones from entering airspace. Valid concerns about public safety and security were raised as increasing incidents were a non-negligible fact. There was not only the airport closing due to drone sightings, but drones also introduced a new dimension of ground-level safety as they were vulnerable to accidental crashes. Such concerns need to be confronted adequately, which explains some of the reluctance for relaxing the rules for experimentation. While this is understandable, it perpetuates that regulations and legislation tend to lag behind novelty and innovation that causes pioneers to feel constrained and unheard.

The notion of scaffolding accounts for the explorers' agentic role we saw, given that agency is shaped by surrounding cultural symbols as well as temporal properties (Emirbayer & Mische, 1998). We see performativity in the explorers' scaffolding practices reflected in seeding novelty into the actor networks and continuous nurturing through evocative narratives and empathy. Others have emphasised the need for cognitive alignment with potential futures by creating coherence between narratives of the future with past and present activities (Hernes & Schultz, 2020; Rindova & Martins, 2021, 2022). We advance such perspectives by highlighting the need for relational scaffolding as a prerequisite for cognitive scaffolding to stretch the imagination further. We saw that stitching together various events in different temporalities converged different activities and interactions into a new present. A relational perspective reveals that actors would not have been able to accomplish this had they not been relationally involved in these different

situated temporalities. Through this involvement, they built up know-how that they recombined into practical solutions to emerging dilemmas in situated events. Relational scaffolding practices were crucial to building up this know-how through emotional sensitivity and supporting others to endure emotional discomfort. Cognitive scaffolding supported others to align their perceptions of the future while allowing for contestation. Augustine et al., (2019) highlight that contestation is important for abstract future imaginations to gain concreteness and become taken seriously. Contestation in our case stems from siloed practices. Instead of brushing contestation aside, it enabled actors to transcend siloed patterns transforming their identity and bending rather than breaking existing practices. Enduring discomfort at multiple levels and aligning different perceptions of the future converged various temporal pathways into a collapse that invoked a new temporary stable present.

4.5.2 Contribution to Scaffolding Transformative Change

Our research on cognitive and relational scaffolding practices furthers our understanding of how scaffolding enables transformation processes, particularly in the context of complex grand challenges. Revisiting their theory on robust action for grand challenges, Gehman et al., (2022) draw attention to scaffolding as an important mechanism for generating novelty and sustained engagement in collective experimenting and learning involving diverse actors with divergent understandings. While these authors also suggest further examination of the role of fictional expectations (Beckert, 2021) and distant futures (Augustine et al., 2019), they do not connect this with scaffolding. Our research brings these notions together by focusing on the interplay between emerging alternative futures and current realities, while actors engage in scaffolding practices to shape their direction. Our findings confirm the distinctive influence of conventional and alternative future imaginations on future-making (Augustine et al., 2019; Lê, 2013). The process model we empirically derived advances such insights by unpacking how imagined alternative futures gain concreteness through relational and cognitive scaffolding practices. We illuminate this from a practice perspective within complex situated entanglements of actors, practices and ideas about the future.

Our theoretical contribution concerns identifying relational scaffolding practices as foundational to cognitive scaffolding indicating that cognitive scaffolding alone is insufficient to instigate concerted action. The emphasis in the literature on scaffolding as a rational knowledge-enhancing process stems from Orlikowski (2006) introducing the notion of scaffolding as a metaphor for how materiality was conducive to human knowledgeability (Swan, 2006). Orlikowski (2006) emphasises

the materiality of knowing in practice by comparing construction scaffolding with supportive material structures that enable and restrain the knowledgeability of human action. Elaborating the cognitive metaphor, Casasnovas & Ferraro (2022) highlight that material scaffolding is preceded by cultural scaffolding through norms and frameworks. These metaphorical applications of the notion of scaffolding draw on constructivist learning theories. Shvarts & Bakker (2019) describe how the metaphor explains how novices are able to adopt new conceptual abilities in the 'zone of proximal development' when scaffolded by experts but encounter difficulties with stretching further. Constructivist theory thus assumes the leveraging of a priori knowable expert knowledge rather than the collaborative discovery in circumstances of not knowing that we observed and consider necessary for instigating deep transformative change. Discovery processes benefit from non-rational abductive mechanisms to move away from practices that are no longer appropriate to collectively discover alternative possibilities that might work (Bartel & Garud, 2003; Golden-Biddle, 2020). This is different from moving towards knowable end states as specified by expertise. Scaffolding in discovery processes involves the sensing and intuition we identified in our case to become aware of what is 'alive' in a situation or over time in a system. This implies relational awareness and following hunches on what might work given a situation rather than focusing on cognitively grasping unidentified knowledge. Hence, the emphasis is on doing to understand what works pragmatically instead of thinking analytically to determine what to do next.

Mair et al. (2016) transcend the cognitive metaphorical view of scaffolding by illuminating how scaffolding mechanisms of mobilising, stabilising and concealing transform behaviour and interaction patterns in societal challenges. The authors attribute deliberate intent to actors designing and planning the scaffolding that induces transformation to alternative futures by pursuing multiple goals while hiding others that were nevertheless purposively pursued. Concealing refers to how an organisation can deliberately focus on generally acceptable consequences to hide emerging contestable consequences deemed worthy by the scaffolding-initiating organisation. The study positions scaffolding as connective devices between "those who prompt transformation efforts and those who inhabit the institutional arrangements to be transformed" Mair et al. (2016, p.2039). We recognise that Mair et al. (2016, p.2034) challenge Selznick's theory on grassroots movements emphasising the commitment of powerful actors, yet, in our case, concealing and 'nudging' was highly controversial given the public role of the organisation for being associated with manipulation. This might explain the

emphasis on relational scaffolding, which in our case enabled others to engage with the cognitive scaffolding provided.

In our case downplaying the discomfort invoked by the introduction of drones in the mobility system, particularly in the airspace domain, was not an option for moving forward. As engaging with alternative futures invoked emotional discomfort stemming from cognitive dissonance and ambiguity (Hirsh et al., 2012), relational scaffolding practices transformed abstract feelings into concrete approachable concerns enabling endurance and transcendence. On this relational basis, cultural and material supportive structures were built through cognitive scaffolding practices that rendered abstract envisioned futures into more concrete emerging futures. Sometimes structures may serve simultaneously as relational and cognitive scaffolding. An illustrative example is the ministerial letter, which provided relational support by giving legitimacy to action and offered enabling constraints by drafting expectations to align different perceptions of the future. Relational scaffolding has been attributed to boundary spanners who by building relationships across network members incorporate know-how that can be leveraged to ensure that new knowledge practices introduced in the network remain within its members' zone of proximal development (Roberts & Beamish, 2017). This entails creating a setting in which members of a network grasp, embrace and use knowledge previously considered beyond their capacity to acknowledge and appreciate. Having built strong ties and acquaintance with network partners, the boundary spanner is emphatically part of this setting often acting as a negotiator or middle-man to connect different parties (Roberts & Beamish, 2017). Due to relational scaffolding explorers in our case could connect opportunities with concerns across departments to transcend siloed practices.

4.5.3 Contribution to Imagination in Future-making

Although the future-making approach draws attention to how organisations produce and enact the future on a day-to-day basis combining building and dwelling (Comi & Whyte, 2018; Wenzel et al., 2020; Whyte et al., 2022), contemporary theories emphasise the construction of teleological pathways guided by abstract intentions or a 'North star' (Rindova & Martins, 2021, 2022; Sharma et al., 2022). In contrast, a pure dwelling approach focuses on practical coping strategies that emphasise the evolving, situated activities of actors, who progress gradually based on future expectations grounded in past and present experiences. (Chia & Holt, 2006). Considering the first in line with *strategy-as-practice* and the second as *strategy-in-practice*, we concur with (MacKay et al., 2021) that organisational actors and the scholars studying them often place themselves outside the practices

they are entangled in. Therefore, we adopted an immersive within-perspective in our theorising to gain a deeper insight into the interplay between imagination and future-making practices and the influence of actors' agentic roles. This perspective enables us to suggest cultivating awareness in organisational future-making that enables discovery in complex environments rather than translating or co-creating knowledge in practice (Bansal & Sharma, 2022). Extending Bansal & Sharma's (2022) preliminary ideas on performing research with managers to unlock interacting research and practice knowledge systems, we propose that cultivating awareness calls for postponing knowledge judgments or evaluations to let in the sensation of environmental cues.

A performative view on cultivating awareness underlines the mutual constitutiveness of scaffolding practices and harvesting narrative arguments. The performativity of the scaffolding practices generates narrative arguments that can only be generated from the particular scaffolding practices in a situated event. At the same time, these scaffolding practices are enabled by the configuration of cues or resources available in the situation. Any other configuration of institutionalised values and beliefs, organisational structures, actors with practical and embodied knowledge, emotional discomfort and imagination would have altered the process and perhaps the induced change. In our case, such configurations entailed, for instance, the prevailing narrative in aviation or the drone ecosystem, existing siloed practices, different levels of discomfort, the historic timelines and accumulated know-how of the field experimenters, explorers and various operational departments, and their interrelations. In this specific configuration, the previous work relations of an explorer proved vital for unlocking the impasse between the field experimenters and operational departments. Yet, these relations might not have been leveraged if signals had not been picked up in the field. Hence, awareness to pick up the broad range of cues and connect them meaningfully with available resources drove present future-making in our case study.

Cultivating awareness enhances the imagination of alternative possibilities beyond merely reconfiguring past experiences by leveraging diversity. From a process ontology, considering change as fluid, pervasive, open-ended and indivisible, awareness helps to notice the micro-changes that signify larger shifts (Tsoukas & Chia, 2002). In our case, awareness elicited micro-processes that were blocking change. Both imply the need for active engagement – i.e., being mindfully present and engaged – to notice emerging details and opportunities that otherwise may be overlooked (Weick & Sutcliffe, 2007). With leveraging diversity, we point to the distribution of knowledge across actors in a network to be leveraged and cognitive

processes of sensemaking and sensegiving (Gioia & Chittipeddi, 1991) but also to the sensing of diversity in relational aspects, such as variations of emotional discomfort associated with ongoing developments or demands. This sensitivity enables intermediaries, such as the explorers in our case, to tailor communication to resonate with diverse relational needs (Rouleau, 2005). Rouleau (2005) found micro-practices of disciplining the 'receiving client' of change, such as masking negative emotions and convincing tactics, to indicate intermediaries as sellers of strategic change. In contrast, we emphasise that relational scaffolding empathically acknowledges emotional discomfort and aims for its deliberate endurance in a political arena where actors will be held accountable for the change.

4.5.4 Practical Implications

The practical use for our model is twofold. One, a better understanding of the mechanisms involved in scaffolding efforts enables actors to shape the interplay between emerging alternative futures and present realities by engaging in mundane performative practices, and two, as relational scaffolding supports actors over time to endure discomfort it provides a foundation for cognitive scaffolding that enables actors to align while allowing for contestation. Scaffolding practices, as we describe them, offer a means for acting purposively without end in view. Especially relational scaffolding relies on sensing and discovery rather than knowing and building the future. The actionability of the network is activated through sensing and discovering what is 'alive' in a network of actors. This differs from extracting knowledge from the network to translate into action in that it calls on actively engaged actors. This prevents the knowledge-action gap commonly identified as leading to inertia.

In processes of sensing and discovering, (inter)action drives knowledge instead of the other way around, while knowledgeable actors enact scaffolding practices. This practice-based orientation gives sensing and discovery processes its directionality, instead of deliberately setting a 'dot on the horizon' giving direction to actors' activities. All practices are teleoaffectively structured, which gives them directionality as actors in mastering a practice learn "what to pay attention to, what to disregard, and when to do so. By signifying to people what is to be done next, the teleoaffective structure of practices constitutes a horizon of attentional relevance, prefiguring what we should pay attention to" (Nicolini & Mengis, 2024, p.218). Gaining trust and confidence in such practices enables actors to act purposively without teleologically structured pathways to keep track. This implies that there is no need to fear for the risk of empty horizons (Kreiner & Winch, 2008) if actors can

let go of the false security that they tend to attribute to knowledge and rational decision-making.

Understanding the mechanisms of cognitive and relational scaffolding in terms of contesting, enduring and aligning relates to the roots of scaffolding in education. Scaffolding risk-taking supports transformative learning (Grocott et al., 2019). As actors explore the dynamics of possible alternative futures through abstract imagination and concrete exploration, they discover implicit rules governing the imaginations they produce, much like young learners use school instruction and play to stretch their conceptual abilities. Such explorative activities enable actors to engage with the pull to potentiality of possible alternative futures and decouple from comfortable habitual practices to see them from new perspectives. Risk-taking is an essential part of manoeuvring towards desirable sustainable futures that involves bending the known and comfortable into the not-yet-known and uncomfortable. This seems an odd thing to do and therefore comes with feelings of anxiety and ambiguity (Hirsh et al., 2012) that need containment (see Study 1), especially since the risk-taking in transformative change is a collective endeavour. Containment fosters the group cohesion required to engage in unfamiliar practices and to deal with uncertainty. This calls for enabling leadership instead of pull to order and control (Uhl-Bien & Arena, 2017). Relieving invoked feelings of discomfort and uncertainty by applying known but inappropriate methods is counterproductive to explorative practices. We see that relational scaffolding can create an enabling environment allowing actors to gain confidence and trust to engage in unfamiliar practices involving novelty that unsettles their habitual 'being in the world'. We expect the notions of pull to order in response to pull to potentiality to be recognisable for most actors in traditionally hierarchical structured organisations. In our experience, entrepreneurial actors within such organisations often feel that fuelling future-making and innovation is a matter of dragging and pulling. Our model suggests that it is futile to attempt to convince others if they cannot connect on both the cognitive and affective levels.

While actors may intentionally engage in scaffolding practices, shaping the interplay between emerging alternative futures and present realities depends on the emergence of novelty and relationships arising from actors' interactions. Our model underscores the performativity of scaffolding practices even when consequential action appears unsuccessful. It is difficult to see the consequences of one's doings and sayings in the middle of a transition process, because small unnoticed contributions may eventually lead to large changes (Plowman et al., 2007), which are only identifiable in hindsight. Our model explains how innovators

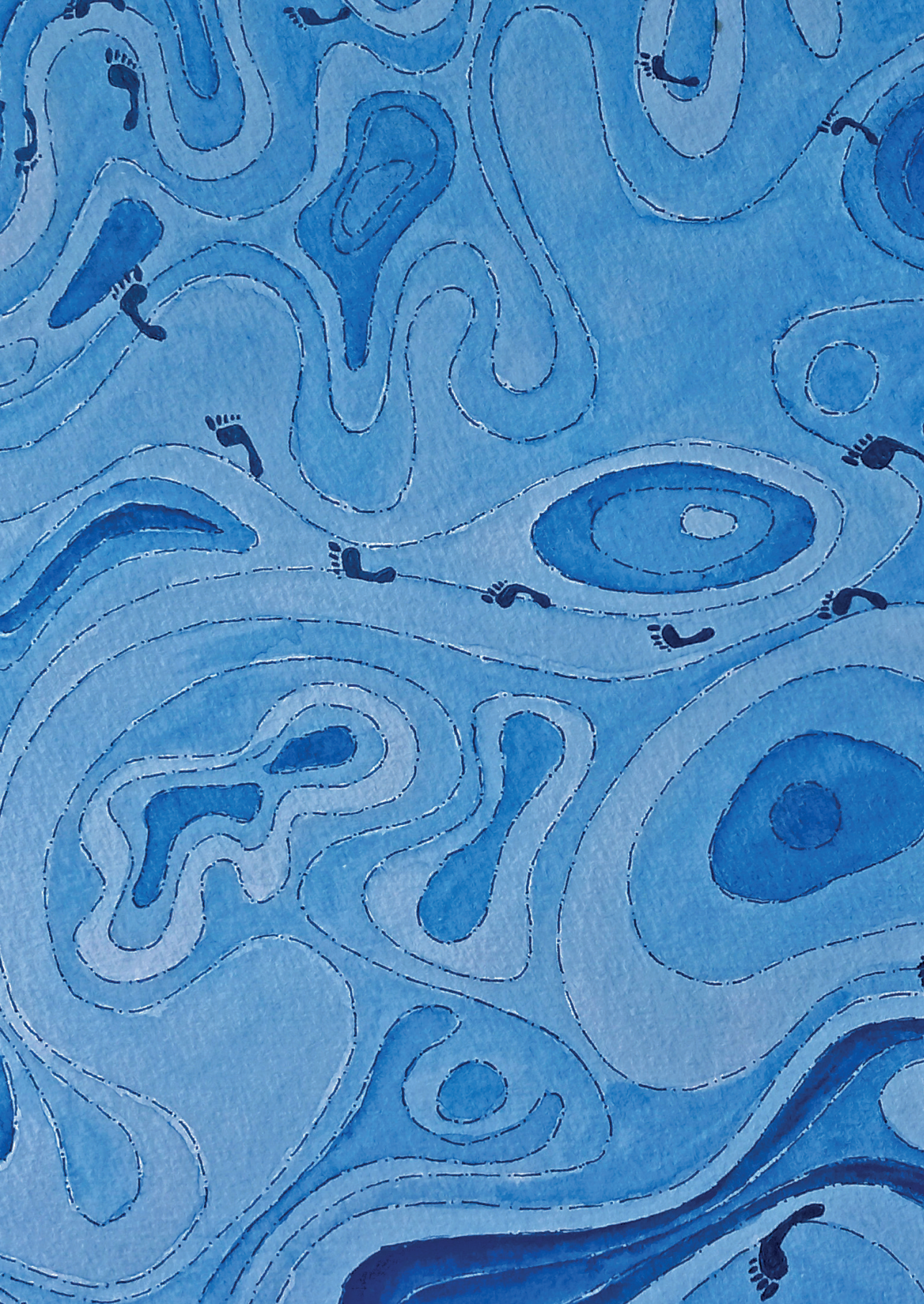
can act as intermediaries between entrepreneurial actors reifying the pull to potentiality and other actors enacting the pull to order. As intermediaries, they can support to resist the pull to order that alternative future imaginations with high novelty might provoke. By bridging both worlds, others may be able to bend constraining structures and change their practices.

4.5.5 Boundary Conditions and Further Research

The study was conducted at a large public organisation. We obtained insight into the conduct of external parties through the explorers. We cannot predict in how far how the model would generalise to commercial organisations, although the pull to order and pull to potentiality concepts draw on the exploration-exploitation debate that has been going on for decades in industry. Both cognitive and relational scaffolding in the drones journey described in this paper is confined to affiliated operational departments. This may be the result of the natural zone of influence that civil servants in this case had and our choice of approaching the future-making practice from the civil servants' perspective due to reasons of practicality and accessibility. Taking into account the perspectives of the collaborative parties might give a more balanced view as it would give insight into the interactions from their various perspectives. We do not expect to find different scaffolding practices, but further exploration could shed light on actual responses and other actors' roles in the scaffolding practices (e.g., the role of mobilised authoritative powers).

Another boundary condition is the focus on the drones journey, which is arguably a mature and customer-ready novelty. This maturity and readiness level in combination with drones' assumed contribution to sustainable and other organisational goals was the very reason for the explorers to intervene. It is possible that scaffolding practices are most fruitful when novelty is in this stage, however, we have observed similar scaffolding practices emerging in less mature technology and applications, such as tube transportation or AI and data driven mobility. The accomplished drones registration journey allowed us to oversee how scaffolding practices enabled purposive action with no end in sight while identifying that at some point in the journey registration did become an end in sight. We explained how this turned the challenge from the complex into the complicated domain altering the approach (Snowden & Rancati, 2021). Furthermore, this research sheds light on the relationship between micro-level practices and macro-level change as the new drone registration procedure opened up constraints that hampered distributed experimentation (Ferraro et al., 2015). A more detailed examination of the specific scaffolding and narrative arguments at the outset of less mature novelty or imagined future possibilities could elucidate how legislation and field

developments might co-evolve rather than of legislation lagging behind field experimenting as in the drones journey. Taking a critical approach could delve deeper into how such entwined processes can ensure universal values such as equality and sustainability, which we did not observe in the drones journey but found preliminary indications of in the emerging data-driven mobility journey.



5.

Discussion

5.1 Introduction

The main research objective of my thesis was to enhance our understanding of the interplay between alternative futures imagination and everyday future-making practices – i.e., how the future is produced and enacted (Wenzel et al., 2020) – in established organisations. Such organisations tend to linger in practices and processes driven by institutionalised values and beliefs that may no longer be deemed appropriate for dealing with current challenges. Organisations are trying to balance the thin line between yesterday and tomorrow – between pull to order and pull to potentiality – while societal grand challenges urge them to contribute to deep transformative change. Recognising that the future emerges in the present from an interplay between practices of imagination and everyday future-making, the main research question was: How does imagining alternative futures shape and get shaped by future-making practices?

In three studies, I examined the future-making practices of two organisations that by their (semi) public role pursue transformative change towards a more sustainable future. Two of the studies were designed around the particular practice of probing alternative futures, which takes an inquisitive approach to future-making (Whyte et al., 2022) through the materialisation of artefacts from the future (Hovorka & Peter, 2021). This meant that I was able to study future-making practices aimed at imagining possible non-linear futures rather than extrapolating probable linear futures (Augustine et al., 2019), which was crucial for avoiding future-making practices focused on orthodox imaginaries (Dey & Mason, 2018) and probabilistic instead of possibilistic thinking (Grimes & Vogus, 2021). In the third study, I broadened my research scope to encompass a wider range of customary future-oriented practices within which the probing practice was situated in Study 2. This allowed me to study how actors shaped the interplay between present realities and emerging alternative possibilities, which had been underexposed in the studies of the specific future probing practice.

In the sections below, I first summarise the findings of the three empirical studies. Answering the study-specific research questions, I highlight the difficulties that actors encounter in connecting practices of imagination with everyday future-making. Conceptualising the problematic lack of imagination as a challenge of resisting pull-to-order forces rather than a lack of cognitive ability, reveals how organisational pull-to-order forces hamper the agentic pull to potentiality of imaginative practices. Next, I synthesise the insights to articulate the theoretical contributions to the literature on future-making practices in the context of grand

challenges. I then articulate contributions to design research and practice, and the practical implications of my findings for organisations and education. I conclude by reflecting on the boundary conditions of my research and provide suggestions for future research.

5.2 Summary of Main Findings

The studies on future probing revealed the challenges involved in taking a probing approach to future-making that engages with a multiplicity of possible alternative futures and the uncertainty surrounding them. The probing approach to future-making was a daunting endeavour due to its emphasis on provocative estranging content resulting from imaginative work and its unfamiliar way of working based on processes of emergence, self-organising and intuition. Focusing on the unfolding future probing practice over time, Study 1 discussed the challenges of connecting alternative future imagination to everyday future-making in terms of containing different perspectives on futures and Study 2 explored the role of values conversations and relational connecting in this mutually shaping interplay. Study 3 aimed to understand the role of alternative future imagination in shaping the interplay between emerging alternative futures and present realities in terms of scaffolding practices.

5.2.1 Study 1: Containing Tensions in Future-making

Study 1 delved into the unfolding of the practice of probing futures, exploring the challenges of imagining possible alternative futures and integrating them with everyday future-making practices. Participatory observations were conducted at a digital service provider in research and education aiming to radically innovate their daily future-making practices by exploring possible alternative futures in cooperation with creative students and co-design research and education staff. The study revealed how enabling activities – e.g., brokering, linking up, group cohesion and bridging – facilitated practising future probing while organisational order responses – e.g., accountability, risk avoidance and solution orientation – introduced containment tensions. These tensions, arising from differences in the approach to cooperation, varying trust in the approach, differing timing and tempo, and organising exploration next to regular work, accumulated over time, which led to a breakdown in cooperative practice. Particularly declining trust in the approach challenged the groups' togetherness around the different future perspectives they held.

I argued that the practice of probing futures pressured the organisational system by introducing a novel way of working that challenges the rather hierarchically structured way of organising. Furthermore, developing estranging conceptual probes increased that pressure as these ideas opened up possible alternative worlds with fundamentally different value orderings. While this pressure induced enthusiasm during the bootcamp weeks that generated a lot of energy and information flow, afterwards they tended to return to business-as-usual questioning the meaning of engaging with such speculative futures. Employees were interested in addressed themes but experienced difficulty linking them to their daily practice in which they held completely different perceptions of the future.

The study underscored the importance of alertness to early retreats to more likely, conventional futures, as the aim was to challenge current dominant values and beliefs and discover alternative desirable patterns. Acting on probable conventional future imaginations tends to perpetuate the status quo, reinforcing no longer desirable patterns and indicating a need to expand the range of possible future imaginations (Grimes & Vogus, 2021). In other words, it matters what is being imagined content-wise. However, this stretching of imagination induced a persistent pull to imagining more conventional futures, which indicated different perspectives on futures at play among collaborating partners that needed containment, to avoid dismissing possibilities before reflecting on the implications of more unfamiliar futures. As long as the sense of togetherness among participating partners was high, such containment was provided through enabling activities such as brokering and stimulating group cohesion by leveraging informal networks of ‘ambassador’ participants. Over time, participants could no longer resist the organisational pull-to-order forces exerted upon them, such as the need to be accountable or the call for concrete solutions.

Nevertheless, this study demonstrated that collaboratively probing possible alternative futures during an intensive bootcamp with students triggered an experiential, intuitive engagement with future probes and the ‘other’ worlds they disclosed that can be characterised as ‘doing futures’ (Riemer et al., 2023). The students’ enthusiasm was a key enabler to attract employees and arrange encounters with and dialogue around the estranging probes. However, these encounters did not generate enough energy to leverage further action. Reflecting on experiences and implications during facilitated co-design sessions helped discover emerging themes worth amplifying, but linking back to daily future-making was not self-evident. Pressure from estranging future imaginations is needed to create significant differences as a condition for emergence (Eoyang,

2001). The invoked discomfort found containment for some time through enabling activities of various participants, but the exchange of information remained limited to organised events. Over time, the increasing pull-to-order forces signalled for critically reflecting on the process and cooperation leading to a breakdown. Notably, this signalling function of pull-to-order forces is important to attend to, as in a continued process of future probing emerging patterns and feedback loops help to clarify cause-and-effect relationships worth stabilising over time. As such patterns become clear, switching to teleologically structured approaches may become expedient. Containment tensions can serve as heedful indicators to evaluate the appropriateness of the probing approach.

5.2.2 Study 2: Values Conversations and Empathic Interrelating

Building on the insight that enduring the estranging content of imagined futures matters for linking possible alternative future imagination and everyday future-making, the second future probing study addresses the role of values conversations in achieving such linkage. Study 2 reveals how the practice of probing futures unfolds over time focusing on the mutually shaping interplay between alternative futures imaginative work and values conversations in the context of future-making at a public organisation. Participatory observation during a cooperative future probing practice similar to the one in Study 1 was followed by – due to COVID-19 restrictions largely online – organisational ethnography. I followed a group of frontrunners mandated to explore uncharted futures and innovations aiming to transform organisational future-making practices to contribute to more sustainable mobility futures.

The findings elicited how the practice of probing futures evolved across three realms of future making, each with its typical challenges to performing values conversations – entering the zone of discomfort in the irreal realm, connecting lived experience in the real realm, and rehearsing with the trouble in the as-if real realm. These challenges induced mechanisms of stretching sideways, embracing and adapting within the respective realms. Yet, order responses, surfacing as a lack of shared suspension of disbelief, a lack of shared sense of urgency and a lack of shared sense of criticality, induced paradoxical mechanisms of self-censoring, dodging and mere surviving within the respective realms.

Values conversations within the realms were shaped by the predominance of one of two paradoxical mechanisms. While in the irreal realm the cooperation with students facilitated stretching sideways to alternative futures, occasional self-censoring prevented highly speculative imaginations from being exhibited to

a broader audience. In the real realm, values conversations were mainly dodged as actors began to judge their accuracy, although there was some embracing as one actor regarded insights from probing as evident until proven otherwise. This allowed the actor to have values conversations with civil servants about emerging themes. However, civil servants were unable to relate these themes to their daily practice, probably because they were abstractions from how the experiential probes had presented them. Values conversations in the as-if real realm did not encounter this problem as the probing experiments were experiential in the present for anyone involved. Non-linear imagined futures ceased to be non-linear as previously perceived future time had collapsed onto the present. The civil servants just needed to adapt experimental probes, such as novel netiquettes or local meeting hubs, to their own needs in the current pandemic situation or invent their own probes. Due to the pandemic conditions, to many employees it became a matter of merely surviving until restrictions would be relieved instead of considering permanent change of values as intended by the frontrunners.

The change from probing practice to analytical practice in the real realm was exemplary of switching from navigating complexity to a more structured approach too soon to discover emerging patterns. This might indicate that it was not explicit enough *what* to share during values conversations resulting in a lack of confidence among frontrunners to conduct probing-based values conversations. Almost simultaneously the cosmological event of the pandemic collapsed previously perceived future events onto the present – e.g., non-mobility and remote working – which triggered immediate probing experiments. This ‘rehearsing with the trouble’ as if it were to stay served as an awakening event to many as they experienced changing value orders and sustainable effects on nature up close and personal. Based on these findings, it was proposed to establish an as-if real realm between the unreal and real realms to break the deadlock that often follows the inadequate use of structured approaches for managing the future in complex challenges whose cause-and-effect relationships are ex ante unclear and undeterminable. The proposed as-if real realm enacts adaptive space, that is the conditions necessary to effectively leverage the tension between divergent and convergent processes.

I argued that the practice of probing futures allowed actors to generate emergence (Lichtenstein, 2014) but such emergence was not self-evident and pull-to-order forces indicated feelings of discomfort and psychological anxiety. While the unreal realm supported actors to overcome a lack of imagination and align their perceptions of the future to a broad range of possibilities imagined by the students, linking possible alternative future imaginations to daily future-making practices in the real

realm proved challenging. As relating along content lines can be challenging given the estranging characteristics of imagined possible alternative futures, I claimed that empathic interrelating supports this challenge by building strong empathic personal relationships. Successful empathic interrelating necessitates both lived experience in future probing and knowing in practice on operational and personal levels to make beneficial connections. Study 2 shows that insufficient lived experience and practical knowledge on both sides results in a lack of confidence to adequately engage others in values conversations leading to dodging.

5.2.3 Study 3: Scaffolding Practices

Study 3 aimed to understand how actors shape the interplay between present realities and alternative future possibilities from ethnographic observations of the future-oriented practices of the frontrunners at the same case organisation as in Study 2. The study identified cognitive scaffolding practices that render a wider palette of possibilities conceivable and enable others to align with and contest diverse perceptions of the future, and relational scaffolding practices that enable others to endure the associated psychological discomfort and transcend current ways of future-making. The concept of scaffolding as refers to temporary supportive structures that enable actors to develop and adopt novel ways of thinking and acting that were previously inconceivable.

Cognitive scaffolding started with typical explorers bringing weak signals of technological or social novelty in society into organisational discourse. Taking a proactive approach to envisioning alternative futures, readiness assessment and preliminary calculations against organisational goals, served as initial scaffolding during interaction with operational departments to align practical opportunities for exploring concrete emerging futures. Getting employees on board required cognitive scaffolding to enable them to align and contest diverse perceptions of the future. The performative practice of envisioning alternative futures served as cognitive scaffolding to stretch imagination during conversations, while emerging narratives helped link this imaginative work with daily future-making practice. In this stage, the objective was agenda-setting and getting others on board. When abstract future imaginations became concrete enough for experimentation, partners were sought in the field (or they had found them) to concretise emergent futures further for their contribution to organisational goals and how this would affect current practices. For instance, a change in current rules and regulations. Simultaneous relational scaffolding was directed towards enduring felt discomfort at deep transformational and operational levels. The deep transformational level involved organisational and personal identities, core values, and belief systems

and therefore surfaced as reputational risks. Practical operational levels mainly involved removing obstacles that had led to stifling relationships between involved parties and seizing opportunities. While easing discomfort, narratives relating to novel identities and past analogies were constructed. Concerns on a more practical level required empathic understanding of different perspectives, transcending oppositions and combining practical knowing to establish cooperative 'doable' courses of action. Narratives included political and legal boundaries structuring the playing field.

This study highlights how alternative futures imagination challenges people's current practices inviting them to become critical inquirers and supporting them in stretching their imagination to a broader range of possibilities. I argued that it is crucial to maintain an inquisitive approach sustaining and creativity to avoid premature closure to specific visions. The data revealed that it is tempting to switch to a teleological approach aimed at particular innovations as a goal. Although setting such goals makes activities evaluative (Ferraro et al., 2015) they also narrow the range of possible responses (Lê, 2013). I argued that probing for emerging patterns and critically challenging them is necessary to evaluate whether activities are contributing to the set goals and whether the goals are still relevant by critically questioning the systemic and long-term contribution to a sustainable future.

In summary, the three studies demonstrate the necessity of containing the psychological discomfort associated with stretching imagination sideways (Study 1), propose relationality as a prerequisite for conducting values conversations that bridge imagined alternative futures and everyday future-making (Study 2) and reinterpret scaffolding practices as both cognitive and relational (Study 3).

5.3 Theoretical Contributions and Positioning

This research set out to understand the interplay between imagining alternative futures and everyday future-making practices in established organisations based on my observation in practical settings that linking imagined futures with present realities was problematic when probing alternative futures. At the time, I attributed this to a cognitive lack of imagination and disbelief about the plausibility of imagined futures. It is not surprising that this research has indeed confirmed difficulties around making the connection, given the anxiety that speculations about alternative futures may evoke. However, by conceptualising the lack of imagination as a relational challenge within organisations, rather than a question

of individuals' cognitive capacities, I have been able to uncover several implications for organisational theory concerning future-making practices and addressing grand challenges. In this section, I synthesise and expand on the insights presented in the previous chapters.

5.3.1 A Probing Approach to Future-making

In light of faltering organisational approaches to control and plan for an unknown and unknowable future, (Wenzel & Krämer, 2018) call for research on organisational future-making practices. An emerging stream of literature uses 'future-making' as a lens to study how organisations produce and enact the future from a practice perspective (Nicolini, 2012). The future-making perspective reconciles building and dwelling theories (Chia & Holt, 2006) on how organisations orient themselves to what has yet to come by emphasising the crafting of imagined futures into form and realisable courses of action (Comi & Whyte, 2018). "Future-making is the work of making sense of possible and probable futures, and evaluating, negotiating and giving form to preferred ones" (Whyte et al., 2022, p.2). Scholars unpack how actors and organisations entangled in situated activities influence how the future unfolds.

Most scholars portray organisations as engaged in teleological processes in which imagination is seen as the driving force of action mainly attributed towards preferred futures or visions (e.g., Pettit et al., 2023; Sharma et al., 2022). While it is recognised that pathways are negotiated and outcomes may diverge from intent, this work represents causation logic – seeking means to an end – in the decision-making that drives the future-making forward. Whether taking fictional expectations (Beckert, 2013, 2021), the future perfect (Fuglsang & Mattsson, 2011; Pitsis et al., 2003) or narrative futures (Beckert & Bronk, 2019; Dalpiaz & Di Stefano, 2018; Rindova & Martins, 2022) as instruments of meaning-making, this work constitutes complexity-reductive approaches, deriving their success from knowledge and knowing available beforehand (Sharma et al., 2022; Sharma & Bansal, 2020). The disadvantage of such rational processes is that they overlook non-rational intuition and embodied sensing, which are only present in the moment. Intuition and sensing contribute to awareness of abductive patterns that may lead to unforeseen system-wide transformations (Dunne & Dougherty, 2016; Golden-Biddle, 2020).

Interestingly, theoretical reflections also question the emphasis on knowledge and knowing in organisational engagement with the future. For instance, Naidoo (2018) mobilises Heidegger's notion of 'futurity' to conceptualise organisational futurity as inherently future-oriented and constitutive of the future before rational

knowing or knowledge comes into play. As this renders speculation inappropriate, the author then leaves the reader with the question of how organisational futurity might be intelligible or disclosed. Such philosophical contemplations often raise more questions than provide practical guidance for applying theoretical insights in real-world contexts. I therefore conclude that the revived organisational literature on future and future-making is in the middle of experiencing the intricate entanglements of being in the world under study. With my perspective on probing futures as enacting the future in present-day situated activities, I endeavour to offer a modest contribution.

The probing approach to future-making emphasises emergence, self-organisation and intuition. Based on a discovery process of change that emerges unintendedly in response to circumstances (Golden-Biddle, 2020; Plowman et al., 2007) the probing approach does not direct deliberate intention towards future outcomes, but towards challenging the status quo, cultivating conditions, and discovering and amplifying or dampening patterns. This corresponds to a relational understanding of the world, where human and nonhuman interactions continuously shape our lives, alongside a critical approach that seeks to change power dynamics and imagine new ways of organising societies and economies (Ergene et al., 2021). Hence, I conclude that future probing entails future-making by discovery rather than future-making by design, yet doing so purposively by generating creative tension conform 'enacting emergence' (Lichtenstein, 2014).

Future probing offers means to provoke and leverage differences within a system to instigate change processes without a priori knowledge about their end state. According to (Nayak & Chia, 2011, p.294) "to think in genuinely processual terms is to think in terms of difference in kind and their union" and "to think in terms of qualitative difference is to avoid the illusion of time as a spatial quantity" (p. 295). Taking a strong process perspective to time and considering change as a continuous state of becoming (Tsoukas & Chia, 2002), a probing approach to future-making assumes utter ignorance about long-term future developments and considers decision-making as a non-rational process in which "meaning, movement and emotions are inextricably linked" (Nayak & Chia, 2011, p.295).

Probing futures, contrary to teleological approaches, aligns with effectuation perspectives on decision-making and constructing futures by figuring out what outcomes could result from a given set of means (Sarasvathy, 2001). While both causation and effectuation are bound by the availability of means to construct futures, the probing approach allows for more freedom in outcomes. As such,

it can more easily adapt to unexpected events or situations. Probing also differs from teleological approaches to future-making in how future imaginations are used. While teleological approaches seek desirable futures that can be translated into preferred goals, probing explores the widest possible range of desirable as well as undesirable futures to understand their implications for present action. As desirability is always contested, being critical towards what is depicted as a desirable future is at the heart of the probing approach.

The core purpose of future probing is to become aware of a wide spectrum of possible interactions given a situation. This resembles discovery approaches that emphasise leveraging unintended breakdowns of practices (Golden-Biddle, 2020; Jarzabkowski, Lê, et al., 2019) rather than to pursue imagined futures (Stam et al., 2014). Probing futures, however, aims to force such breakdowns by pressuring the current system. Future probing typically explores various possible futures and critically scrutinises them for what they would bring into being. This is neither analytical research nor probabilistic calculation. Rather, probing futures is about interpreting, associating and intuiting what is needed to move away from patterns that sustain a problematic situation. This requires actors with richly filled backpacks of know-how and experiences that they can combine with their present sensations of a given situation.

Due to its emphasis on imagining alternative futures, practising future probing can be seen as a training in using the senses. Non-rational responses, such as instincts, habits and norms influence decision-making even when seemingly rationally applying desires and beliefs (Cushman, 2020; Kahneman, 2011). Non-rational responses to a given situation precede rational reflection and interpretation but often remain unconscious unless they induce cognitive dissonance – a mismatch between someone's beliefs, desires and their actions (Festinger as cited in Cushman, 2020). Probes that provoke such cognitive dissonance are likely the ones that disclose taken for granted action patterns in the current system, such as public transport passengers becoming inattentive to their surroundings due to mobile devices which is growing into a new 'normal' but was 'seen' when students presented a future probe on window becoming screens to block a more dystopian future environment. Probing such extreme futures helps to become mindful to one's embodied instinctive responses, whether positive or negative, while reflection on the action patterns and unfamiliar value orderings they disclose, helps to discover similar emerging patterns that are collectively unseen due to prevailing habits and norms. Awareness of one's distress and feeling unsettled with probing ideas during development is therefore an indication of identifying the provocative probes

needed to disclose collectively unseen patterns. Instead of evading these feelings, as happened with highly speculative probes in the probing studies, one should try to endure these feelings and use them as leverage points for reflection. Cultivating this capacity of staying with the trouble is one of the main characteristics of practising future probing. In other words, the distinctive feature of the probing approach to future-making does not relate to the quality of its content – the probes – but relates to the capacity to recognise and decouple from current habits and thinking patterns. This is a movement away from what is and letting in what could be.

By contrasting probing with teleological pathway approaches, I do not intend to dismiss their usefulness. I consider the practice of future-making a continuous dynamic interplay between structured teleology and unstructured evolution. Future probes set temporary enabling constraints to discover evolutionary patterns worth amplifying. Amplification is a non-teleological process of causing ripple effects in a system that only reveals how a future state has been achieved in retrospect. Instead of striving for a priori-defined goals, future probing seeks to deliberately generate the emergence of novelty in the system, which can be nurtured and capitalised on by teleologically applying certain good practices. This suggests that at some point unstructured complex challenges can be brought into the structured complicated domain which asks for different practices (Poli, 2013; Snowden, 2005).

My personal observation is that individual actors and organisations often engage with complex challenges in a teleologically structured manner without questioning the implicit goals. This often leads to complexity reductive problem formulations in which solving one problem tends to lead to the emergence of another one. For instance, instead of discussing how future energy shortages are to be resolved, the discussion should focus on how humans want to deal with energy needs in the future. 'How might we resolve future energy shortages?' is a 'complicated' formulation (Poli, 2013; Snowden, 2005), which can be solved through diagnostics and applying good practice. Considering that the energy challenges are indeed complex, addressing them effectively needs the second 'complex' formulation, i.e., 'How do we handle energy in the future and what is our role in it?'. The first question likely leads to change within governing constraints from current institutionalised values and beliefs. The second question encompasses free exploration to discover patterns across different contexts – configurations of actors, resources, environments, know-how, et cetera. Contextual awareness draws attention to societal norms, cultural factors, historical practices, future expectations, aspirations and other influences that affect the system's dynamics and is needed to address grand challenges effectively.

5.3.2 Stretching Imagination to Cultivating Awareness

Introducing the probing approach to future-making also enhances our understanding of stretching mechanisms in future-making. While organisational scholars have revived future-making as a contested, dynamic and political process (Augustine et al., 2019; Whyte et al., 2022), they only recently began to discover the implications of different types of future imaginations. For instance, Augustine et al. (2019) distinguish distant from near future imaginaries on psychological distance to lived experience. Dey & Mason (2018) explore activist imagination beyond orthodox imaginaries of the Yes-men. Grimes & Vogus (2021) plead for possibilistic instead of probabilistic thinking in future imagination. These studies highlight the different consequences of imagined non-linear futures for present action, yet they do not shed light on the practices and challenges involved in conceiving and enduring such unconventional imagination. Furthermore, future-making practice scholars who investigate how organisations engage with imagined futures in present future-making practice tend to focus on reconciling different temporalities of imagined futures (Alimadadi et al., 2022; Hernes & Schultz, 2020; Rindova & Martins, 2022). For instance, Rindova & Martins (2022) emphasise that distant, or 'desirable futures' as they call them, require the fabrication of a narrative consistent with the past that supports a coherent path into the future. This often leads to pulling back to more conventional futures instead of engaging the tensions. Their example of the automotive industry shows that while the concept of cars is being stretched, the system concept of mobility is not reconsidered. This confirms how a firm's stretching efforts are confined to its economically driven values and motives (Beckert, 2021), which mainly reinforces business as usual (Wright & Nyberg, 2017).

My research on practising future probing reveals how organisations can stretch their imagination to cultivate awareness of previously unseen patterns by deliberately creating and enduring tensions between genuine alternatives and the status quo. Future probing leverages actors' immediate emotional relations with experiential future probes. While temporal stretching can help conceive unconventional future probes, the experiential representation tries to eliminate time as much as possible. The probing practice aims to trigger visceral emotional responses by situating unfamiliar artefacts in the present and creating encounters as if 'the future' were here (Hovorka & Peter, 2021). As such embodied reactions precede rational thinking, they offer an opportunity to gain insight into realistic responses without requiring rational pretence. It requires the imagination and creation of experiential probes contextualised in familiar reality, such as a VR experience of the office of the future or as simple as a written invitation from a tech giant offering a full scholarship in return for the invitee's personal data and lifelong career commitment in our cases.

Such probes served as epistemic objects embodying unfamiliar worlds (Nicolini et al., 2012) and triggered emotional responses of dismay as well as wonder and care.

To conceive a wide range of future probes, past and future temporal depth can be used to imagine unrealised potentials (Bendor et al., 2021). Focusing on the interplay between imagination and action, my research did not address how future imaginations were conceived. Mechanisms of self-censuring and pulling back towards feasibility indicate limits to plausibility, yet my research suggests that such limits are set cognitively and can be postponed. Future research could investigate how more experienced actors, assuming less trouble with ambiguity, would engage in the probing practice. Our research indicates differences between the physical and online probing experiences, but we suspect learning effects as well as indicated by the first study that nevertheless ended in a breakdown. Such research would require long-term engagement between researchers and practitioners.

As the choice of probing questions is inherently political and probing them may bring about the very imagined futures that during probing may have been controversial, awareness of the political implications such questions entail is imperative. Bendor et al. (2021) offer a profound understanding of the different kinds of knowledge produced by asking different kinds of what-if questions illustrated by the case of electric vehicles. Comparing the concepts of forecasting, backcasting, recasting and pastcasting, the authors state that “they are each uniquely situated to help [...] pursue a particular type of inquiry” (Bendor et al., 2021, p.11). While forecasting primarily focuses on predicting future outcomes based on current trends and data, backcasting involves setting a future goal and then working backwards to identify the steps needed to achieve it. Recasting involves reconsidering assumptions and reframing perspectives, while pastcasting involves examining historical precedents and failures to inform future strategies. The authors suggest that forecasting efforts could greatly benefit from recasting exercises to alert actors to the potential uncertainty or fallibility of their underlying assumptions. Similarly, backcasting exercises would gain insight from pastcasting's discernment of historical attempts that proved ineffective in driving change (Bendor et al., 2021).

While I regard the above ‘casting’ approaches as beneficial to start engaging with unprecedented imagined future possibilities, my research draws attention to more non-rational approaches of imagination. According to Bendor et al. (2021) recasting most suitably invokes imagination as it concerns re-evaluating assumptions and reframing perspectives to reconsider how future outcomes might be influenced

by changing variables or viewpoints. While this approach of counterfactual thinking pluralises the past and challenges conventional thinking, it still centres on understanding and adapting within the existing framework anchored to a linear perception of time. Tracing back further would theoretically give access to even more unconventional possibilities (Voros, 2019). In practice, this stresses rational plausibility increasing anxiety that needs containment to enable engaging with such 'preposterous' futures.

The probing practices aim to induce more lateral and abductive thinking (Dunne & Dougherty, 2016; Kolko, 2010) by exploring unconventional alternative perspectives that may not fit neatly into linear forward or backwards-looking paradigms. We found future probing useful for stretching sideways, for instance in the second study, where Vignette 4 about 'Booking a spot on the road' gives an example of a concept from aviation applied to (future) scarcity of available roads. It enhanced further stretching sideways to different contexts as indicated by involved actors discussing the role of novel healthcare and prevention practices in reducing traffic.

Stretching sideways challenges assumptions and conventional thinking about how the future is expected to develop by generating unsettling parallel worlds or alternative scenarios using analogies and metaphors from unrelated fields or domains. Snowden & Rancati (2021, p.20) refer to this as sidecasting or 'cast around' and relate this to weak signal detection. They encourage thinking 'outside the box' and considering unexpected implications or parallel scenarios that could provide new insights or opportunities. Although sidecasting is most beneficial to widen the range of possible alternative courses of present action, the example above shows that it can be stimulated by engaging in other 'casting' approaches, particularly recasting.

5.3.3 Containment

Engaging experientially with alternative futures makes the practice of probing futures fruitful for overcoming the crisis of imagination required for questioning existing institutionalised values and belief systems (Fotaki et al., 2020). This research shows, however, that overcoming this imagination crisis is accompanied by several challenges in integrating future imagination into everyday future-making practice due to high levels of uncertainty and low levels of trust that need containment. Containment refers to creating the group cohesion necessary for 'moving forward' in transformations. Snowden (2005) explains this using solid, liquid and gas states as metaphors for different system states: ordered, complex and chaotic. Drawing on this example we explain containment as follows. In stable

ordered situations, containment occurs naturally from organisational structures that enable and constrain action. In chaotic states, such as the initial stage of the pandemic crisis, the loss of order in human systems challenges containment. It benefits from immediate action by authoritative powers. In the complex situations imposed by grand challenges and open-ended uncertain futures addressed in this dissertation, containment is difficult yet possible. It requires playing with attractors and boundaries to investigate which patterns emerge that can be amplified or disrupted (Snowden, 2005). Probing alternative futures aims to play with attractors – the probes – and boundaries – different spaces in the probing practices containing different actors. This ‘play’ comes with many challenges as described in this dissertation. I particularly draw attention to the invoked emotional discomfort, which needs containment to cope with dissipative structures (Uhl-Bien & Arena, 2018).

Actors experienced stretching imagination as difficult, as indicated by their search for uncertainty reduction in Study 1 and switching to more familiar analytical practices in Study 2. Yet, stretching to alternative possibilities is needed to pressure the current system and potentially generate emergence for change. I argued in Study 1 that enduring such psychological anxiety needs containment on a relational level. The notion of containment also relates to the work of psychoanalyst Bion on the human capacity to absorb and transform chaotic, uncertain, and disturbing emotions into bearable and manageable experiences, both for oneself and others (French et al., 2014). Containment then involves the interpersonal process of containing emotions, which leads to their transformation into coherent thoughts and actions, which is fundamental in all human activities. In human system dynamics, containment refers to a container within which individuals or groups operate self-organised, even amidst uncertainty or complexity (Eoyang, 2001; Snowden, 2005). In both probing studies, containment was at stake. However, it is not helpful to reduce cognitive uncertainty by pulling back to more plausible futures or to resist change, if transformation is desired. Deliberately generating emergence requires actively seeking ‘trouble’ (Selkirk et al., 2018) and staying with it for a while (Haraway, 2016).

To understand this, I introduced Eoyang’s (2001, 2007) CDE model that explains the conditions for emergence in dynamic human systems. C stands for Container, which holds actors together. The container metaphor evokes images of boundaries. Yet these are permeable and adaptable. For instance, a shared project or practice can function as a container. Who participates may change over time. D stands for Difference, which indicates that sufficient deviation from the status quo must

enter the container to trigger the flow of energy. In human systems, this is often achieved by bringing together a diversity of actors. This brings us to E, which stands for Exchange of energy. In human systems, this is mainly the flow of information through interaction. Eoyang (2001) claims that without these three conditions, no emergence can take place. Hence, no significant change or collapse of a system, needed to change tracks or pathways into the future, evolves.

The practice of future probing functioned as a container holding together those involved. The 'practice' container functioned as a relational space where rich interactions were facilitated – the bootcamps, the unreal realm, the exhibits. The provocative future probes that rendered possible alternative values worlds experiential created significant differences in this container. Probes were provocative by design to raise controversy. This controversy creates the tension necessary to disrupt existing patterns (Lichtenstein, 2014). Hence, developed probes created an opportunity to temporarily embrace uncertainty and contest the value worlds they disclosed, such as around non-mobile futures, or AI-governed education.

Simultaneously, the probes' provocativeness evoked psychological discomfort and cognitive dissonance as they challenged people's perceptions of the future and the status quo. While some actors may be able to endure such cognitive discomfort more easily than others, endurance is also influenced by situational aspects. On a practice level, this surfaced as the containment tensions we found in Study 1 – issues with timing & tempo, cooperation, exploration next to normal work and trust. These tensions arose when the participants experienced pull-to-order forces in the organisation – e.g., accountability and solution orientation. Such forces are inherently relational as they stem from habitual practices in the organisation that constitute to a large extent how actors engage with something new. The good news from Study 1 is that these tensions can be contained by enabling activities that stimulate a sense of togetherness and trust. In Study 2 containment was not an issue in the relational space of the unreal realm where "disequilibrium organising [...] defined as pushing the system beyond its norm, outside its usual boundaries of activity" (Lichtenstein, 2014, p.406) was facilitated and endured. Yet in the real realm, probing was discontinued when experiments – as proposed by external advisors – should have been encouraged to expand the relational space and catalyse concerted action. Hence, both probing studies revealed that going from disequilibrium organising in relational spaces to unorthodox experimenting was too challenging. Study 3 demonstrated how existing experiments in the field were employed to exert pressure on the organisation to endorse the creation of

relational spaces by modifying regulations and procedures or facilitating their implementation. Findings on the drones journey showed how field experiments concretised abstract envisioned alternative futures into explorable concrete futures that deviated from the norm and predictable behavioural patterns challenging current rules and regulations. Interviews on other journeys, such as data-driven working or tube transportation, revealed that finding internal partners to cooperate with was always a big hurdle.

While the first probing study did not overcome the hurdle of amplification, this stage in Study 2 was eventually supported by the COVID-19 pandemic, which served as a 'cosmologic' external trigger for change (Howard-Grenville et al., 2017), albeit temporary. Characteristic for this stage in probing futures was the move from temporary semi-structures, such as the unreal realm or bootcamps, to reality.

5.3.4 Relationality

Throughout the three studies, relational aspects played a key role in enduring experienced cognitive discomfort induced by estranging future probes (Studies 1 and 2) and by novel technological applications demanding engagement with unfamiliar practices (Study 3). In Study 1, relational aspects fostered strong group cohesion to contain emotional discomfort induced by tensions that signalled organisational pull-to-order forces. However, maintaining cohesion became challenging as the focus shifted from students to employees straining their time and endurance despite signals indicating the need for re-establishing containment. In Study 2, the transition from the unreal to the real realm faced challenges attributed to limited attention to relational aspects. Employees struggled to sustain values conversations through continuous probing, opting to switch practices instead. Subsequently, the absence of 'soft landings' for probing ideas and follow-up probing experiments indicates a missed opportunity from a relational perspective. In Study 3, scaffolding practices combined cognitive and relational elements, encouraging the expansion of imagination while fostering strong relationships. These strong ties leveraged practical wisdom from previous work relations that helped address emerging issues effectively. As such, relational scaffolding enabled actors to endure discomfort and transcend practical obstacles and objections.

This strong presence of relational aspects and the impact of relational deficiencies indicates that probing futures works *within* the dynamic interconnectedness of the past, the future and the present in ongoing interaction patterns of meaning, movement and emotions (Nayak & Chia, 2011). Answering recent calls for profoundly changing the perspectives and instruments for research and practice

in the context of grand challenges (Howard-Grenville, 2021b; Jarzabkowski et al., 2021) this research particularly addresses Ergene et al.'s (2021) call to shift from a realist to a relational ontology and from a managerial to a critical epistemology.

Relationality draws attention to ethical responsibility, particularly concerning the Other, whether human or non-human. Inspired by Levinas's notion of otherness and his emphasis on close encounters, I explain my line of thinking about the practice of probing futures and relationality below. This needs more elaborate research, as my suggestions are inspired by some preliminary clues, which I could not yet fully explore in my current research. This explanation revolves around the notions of 'conversation spaces' and 'practically wise powerful agents' posed by Durand & Calori (2006) to challenge traditional organisational change theories that emphasise sameness among members concerning ethical behaviour, group dynamics and enacted values. The authors stress the importance of connecting self and sameness with otherness, creating inclusive conversation spaces, and empowering key actors to enact change effectively within organisations. They state that "[p]ractically wise powerful agents are attracted by differences in others, do not misuse their power, and contribute to promoting evolutionary organisational change" and suggest further discussion of the sources of practical wisdom (Durand & Calori, 2006, p.110). Below I argue how practising future probing benefits developing such practical wisdom by opening up conversation spaces around future probes that invoke dialectics around sameness and otherness.

Working with tangible, experiential probes proves particularly helpful to trigger affective responses to experiencing alternative futures up close and personally, as I observed best during the physical exhibitions at the organisations. In my research, even if probes were considered naive student work afterwards, experiencing them triggered energetic conversations giving meaning to 'preposterous' ideas, simply by asking 'what if it were different?'. Probes represented preliminary answers to questions like "What if we had to book a spot on the road like we do when taking a flight?" or "What if on the verge of booking a short distance flight, the procedure was interrupted by a 'call from your great great grandchild' who showed you images of the long-term consequence of your travel choices?". These probes make people think about common rights they have acquired as (technological) progress gradually advanced. They have become taken for granted and are perpetuated through the recurrent use of the material infrastructures and cultural norms that enable them. As probes stretch people's imagination and 'lift' them out of their daily routines and thinking patterns enables them to reflect on current interaction patterns in such socio-material entanglements.

(Semi) public organisations, like DigiOrg and PublicOrg, invest in experimenting to learn about the opportunities that emerging technology, such as AI or blockchain, and social innovations, such as broad prosperity principles, offers to understand their implications for their clients and the broader public. However, through experimenting and scrutinising new infrastructures and ways of organising are developed that may unintentionally reinforce actors' commitment to pursue the implementation of an innovation. The advantageous promise of novelty often suppresses its negative consequences. Consider for instance the ubiquitous use digital devices, which was under scrutiny at the physical exhibition in Study 2 in relation to the 'bubble transportation shuttles with window projections to hide the environment degraded by climate change. Digital devices' promise of democratising power relations has downplayed the negative consequences that are becoming more and more manifest. Driven by dominant neoliberal capitalist imaginaries action patterns around digital devices emerged gradually over the years as computational power grew while the devices became smaller and more portable. Even seemingly neutral scientific discourse can support the development of emerging technologies if the promise is emphasised and negative consequences receive little attention, such as is currently happening in AI or blockchain (e.g., Hughes et al., 2018). Critical 'early warnings' about digital devices come from Silicon Valley tech employees who deliberately limit their children's screen time and from tech critics, like Morozov (2013) in terms of technical solutionism, Jasanoff & Kim (2015) on sociotechnical imaginaries and Zuboff (2019) in terms of surveillance capitalism. Nonetheless, most people more or less mindlessly play along with big tech's value propositions while rules and regulations we consider normal in physical space, for instance on privacy matters, are challenged in digital space. To prevent premature closure on promissory future visions, experiential future probes offer the opportunity to engage in a dialogue about the 'other' value worlds they make visible, e.g., who or what benefits and who or what suffers. Probing futures opens conversational spaces between diverse actors, such as those engaged in experiments that concretise emerging futures of envisioned democratic values and those affected by it, which is particularly interesting when able to involve marginalised groups and non-human entities. Prefiguring what the future might bring, probes offer the opportunity to scrutinise both positive and negative systemic consequences, thereby opening opportunities to act differently.

The argument put forth in this dissertation is that continually probing unprecedented alternative futures fosters the mindset of keeping pathways into the future open for alternative courses of action. It does this by establishing conversation spaces for dialogue, which function as 'containers' for 'exchange'

between diverse actors. Probes serve as attractors by generating 'differences' between alternative and present futures. Hence, creating the three conditions for emergence and self-organisation (Eoyang, 2001, 2007).

As future probes open unreal realms for imagination, they invoke unobtrusive conversation spaces as the probes are still distant from any implementation and thus less threatening. While anything that triggers people's imagination of alternative futures can serve as a probe to instigate dialogue, I stress the experiential value of tangible encounters. Durand & Calori (2006) state that "[t]he encounter with the other (a new role, a new product, a new process, a new ally, etc.) is rendered less problematic for individuals who have the opportunity to integrate into their narrative identities examples of peers and powerful agents who were able to cope with the otherness and integrate the other-ness into their own proper identity story". While this statement supports the relational scaffolding of frontrunners in Study 2, I argue that it also works the other way around.

Probing futures can problematise the mindless dismissal of otherness as it creates encounters with diverse actors who may experience difficulties in coping with otherness. As shown by the physical exhibition in our case, observing such encounters from lived experience can trigger active reflection and reinterpretations. While these can be staged encounters, their effectiveness exceeds that of talk and text. It is comparable to 'user tests' in the design and engineering field that I originate from. User testing product service systems aims to identify design flaws for improving the system. From experience, I know that inviting the engineers to observe such user tests can help them understand that their 'brainchild' may need changing and thus benefits their adaptive capability and induces humbleness when developing future systems. Similarly, engaging in dialogues *after* probing extreme future situations and observing others experiencing them trains awareness of other actors' perspectives. We saw this in Studies 1 and 2 particularly when students returned from probing a public audience in the streets energetically conversing about the insights gained. This suggests that gaining this 'practical wisdom' themselves allows actors and organisations to adjust their behaviour based on new insights and understandings.

As these are political decisions that concern entire populations, I particularly see a role for (semi) public organisations, such as the ones in my case studies, to spend public money wisely by experiencing that alternative futures start today, not tomorrow. Diversity and inclusivity are important to instigate a dialogue about moral and ethical consequences, rather than mindlessly implementing novelty for

economic purposes or promissory desirable values. As probing extreme alternatives can render visible new patterns induced by emerging novelty, this not only offers a choice but also the moral responsibility to act upon what has become visible. For instance, in Study 2 the case of AI and algorithms scrutinised implications of a fully AI-governed mobility system bringing into view choice about who has priority when mobility space is scarce. Although the consequences of such choices often show their impact only in the long term, scrutinising such extreme ideas as early as possible offers an opportunity to incorporate diverse human perspectives in decision-making, including marginalised ones and non-human actors who usually have limited ability to voice their concerns (Coskun et al., 2022; Forlano, 2017). This calls for creativity in eliciting such voices in a way that generally muted voices become heard. As pioneers explore novel ways in which natural resources may serve humanity, such as alternatives for human protein intake (Mattick et al., 2015) or mycelium-based clothing (Ivanova, 2022), eliciting muted voices could avoid some of the earlier pitfalls of human exploitation drift.

5.4 Practical Implications

The empirical findings of this research contribute to our general understanding of future-making, particularly for addressing grand challenges. Zooming in on the interplay between alternative future imaginations and future-making practices, and unpacking the relational dynamics and challenges involved, has revealed practical implications for established organisations seeking to navigate the complex challenges involved and future-related uncertainty. It also offers valuable insights for creative agencies guiding such organisations and for integrating alternative future imagination in transdisciplinary education. In this section, I build on the foundational concepts and findings presented previously to explore the practical implications of my research, demonstrating how it can be applied in real-world contexts.

5.4.1 Implications for Organisations

How things are organised and how organisations operate matters for grand challenges and how the future unfolds. Every generation needs to be aware of its legacy, which may be difficult amidst daily turmoil and everyday demands. Just like our predecessors thought they did the right thing in their time, we may think so too. Like previous generations, we cannot predict the future. Yet complexity theory has furthered our understanding of time-space and it is our moral obligation to use that knowledge wisely. My research on probing alternative futures implies that

leaders and organisations need not wait to respond until exogenous shock – like a pandemic – creates conditions for change, their current core values are explicitly attacked (Tsoukas, 2020) or they receive a court order (de Graaf & Jans, 2015). Probing alternative futures allows them to proactively engage in conversations around possible future value worlds that can challenge current ones to imagine alternative ways of organising for a more sustainable future.

Probing Alternative Futures Is Acting Today

Probing alternative futures is an ongoing inquisitive practice that involves ‘doing’ futures rather than ‘thinking’ about them. Probing collapses future time onto the present as if it were reality to investigate it from diverse perspectives and leverage emerging action patterns worth amplifying, by investing time and resources, or dampen undesirable ones. This differs from traditional approaches, which view futures – or a multitude of futures – as temporally separate from the present and as something to be prepared for or systematically created. Probing futures creates encounters with possible alternative futures, similar to how the pandemic enabled us to re-appreciate the values of well-being and health, how scarce mobility can be overcome, and how reconnecting with the neighbourhood can create a caring environment. Preferably, conditions for such encounters are created in a safe-to-fail environment, not the life-threatening reality of a pandemic.

Future probing involves imagining possible alternative futures, developing experiential future probes and staging encounters with such probes across different relational spaces. The developed future probes make provocative ideas about alternative future worlds experiential in the present, thereby estranging the current world, which triggers bodily responses, imagination and reflection among audiences. Engaging in dialogue around these probes triggers conversations about values that probes disclose compared to current values. Such dialogue enables participants to see their current world and its practices and institutions with fresh eyes. Hence, probes elicit patterns and dilemmas that are usually invisible. Eliciting patterns that sustain undesired aspects of the status quo offers openings for change. Understanding what is not desired and yet often taken for granted reveals what it takes to move away from it. Finding liberation out of such dilemmas calls for ‘curiosity, care and courage’, to speak with Jennifer Howard-Grenville (2021a), yet once you see it, you cannot unsee it. This does not mean you can choose not to act, even for good reasons.

Probing alternative futures aims to generate emergence, self-organisation and intuitive decision-making. To achieve this, future probes need to critically provoke

the current situation by being fundamentally different, which requires creativity and diversity of cooperating actors during probe development. In this process, intuitive non-rational thinking trumps rational thinking to stretch imagination sideways rather than temporally deep across horizons. Lastly, attending to relationships is important to endure feelings of discomfort and sustain a relational space for contesting and aligning different perceptions of the future through dialogue.

Stretching Sideways Rather than Temporally Deep

Overcoming the lack of imagination is more about how estranging to lived experience one can endure than about stretching far across temporal horizons. This claim challenges organisations to engage in possibilistic non-linear thinking transcending rational linearly extrapolated and calculated predictions. Deep transformative change requires a change of pathways – in other words stretching sideways to explore alternative paradigms, instead of thinking that things can be fixed within current paradigms, such as the neoliberal capitalist frameworks that has produced the current grand challenges. A probing approach to future-making enables organisations to do this within the lived experience of daily organisational life. A priori grand future imaginaries or clear visions may serve a function in offering hope and a sense of direction, but future probing enables organisations to become more aware of alternative possibilities in daily future-making practice by facing the dilemmas disclosed and finding an actionable way out.

Imagining unfamiliar alternative futures often invokes psychological discomfort that needs to be endured while investigating their meaning and implications for present action. Such images induce cognitive dissonance, which means that they do not fit with existing worldviews or mental models about how things in one's world work. Enduring this is necessary to suppress humans' inherent tendency to reduce the dissonance either by ignoring, neglecting, or distorting our perception of unfamiliar ideas. Instead, we need to enter this zone of discomfort and face the dilemmas confronted with to find out where the liberating action is. Cognitive dissonance indicates we are engaging with genuinely alternative possibilities worth investigating.

Resisting the Pull to Order: Relational Relating Next to Cognitive Relating

Organisational change often encounters resistance, manifesting as a pull to order and stability. This study finds similar patterns in future probing practices, attributing them to the psychological discomfort triggered by estranging alternative future imaginations. People's inclination to overlook or disregard such troubling potential futures obstructs the exploration of their significance and implications for current

actions. As relating to the content of these alternative imagined futures can pose a cognitive challenge, establishing relational connections proves beneficial for getting people engaged.

For example, linking the significance or implications of future probes to personal contexts and interests can stimulate engagement. Alternatively, understanding the reasons behind resistance can facilitate alignment. In this study, I term this approach 'empathic interrelating,' emphasising its basis in building empathetic relationships. It entails meeting others on equal footing, fostering a space for vulnerability, and attentively acknowledging each other's vulnerabilities. Cultivating such relationships demands genuine curiosity in understanding each other's timelines.

Metaphorically speaking, individuals exist within and perceive the world through their unique timelines, which intersect during interactions. A timeline encompasses a shaped past, a present where actions occur, and a future filled with expectations and aspirations. Change transpires at these intersections, where encounters or experiences unfold in the present while carrying the timelines of involved parties. Positive, reciprocal encounters emerge when individuals grasp the essence and timeline of others. Empathy plays a pivotal role in understanding these timelines, necessitating a temporary shift away from one's own timeline to prioritise understanding the timelines of others.

5.4.2 Implications for the Futuring and Design Field

In this section, I address the design and futuring field simultaneously as scholars advocate the leverage of these competencies into the experiential turn "making the invisible visible and tangible" (Candy et al., 2019, p.5). Design agencies and futurists, referred to as 'creatives', provide their imaginative power and creative services to organisations, responding to their call for clear future visions. Praised for their adeptness in handling uncertain and ambiguous challenges, creatives play a crucial role in addressing complex societal issues and societal transformation. While their focus on producing content showcases strength, it may overlook important relational aspects, posing potential weaknesses in their approach. Hence, like organisations, they must acknowledge the implications of their contributions towards organising a sustainable future.

The probes concept has been used in design research for many purposes, such as inspiration, information, dialogue and participation (Mattelmäki, 2005), yet mainly to inform current design practice. Experiential probes in design studies have developed into exploring disruptive concepts aiming to understand how

‘users’ in their own context interact with such ideas in the context of societal transformation (Peeters et al., 2013). Their extension to the field of future studies follows developments like speculative design (Dunne & Raby, 2013), design fiction (Bleecker, 2009) or experiential scenarios (Candy, 2010; Candy & Dunagan, 2017).

My research draws on such methodology yet presents and examines ‘future probing’ as a distinct organisational future-making practice – i.e., how the future is produced and enacted (Wenzel & Krämer, 2018). The practice perspective enabled me to explore the experiential use of designerly artefacts as part of ongoing processes of future-making rather than a one-time activity or intervention. This way, I connected future imagination and tangible designed experiences with ongoing probe-sense-respond practices for discovering emerging patterns in complex environments (Snowden & Rancati, 2021). This view regards such probing cycles as a distinct approach to act within complexity invoking change by discovery (Golden-Biddle, 2020) rather than informing planned change to achieve shared visions. As such, it implies a more endogenous role for creatives supporting clients to adopt such a way of working rather than offering one-off interventions providing ‘insights’. My research offers three distinct implications for creatives cooperating with organisations to contribute to a more sustainable, inclusive and just future.

Focus on Handling Relational Tensions Above Producing Persuasive Content

It is vital to understand that introducing content that challenges the status quo in the organisational system or even the intent to start working with an unfamiliar designerly approach produces relational tensions. Such tensions stem from uncertainty, different perceptions, or emotional stress associated with the novel situation not matching how one used to perceive the world. Attributing such tensions to cognitive dissonance, constructivist learning theories (Vygotskii & Cole, 1978) suggest to maintain learning within the zone of proximal development, which implies presenting novelty that one can endure with the help of an expert but not yet autonomous. Creatives can be such experts. Not regarding the content, as societal deep transformative change requires us all to engage in uncharted terrain, but in enduring ambiguity and stretching imagination beyond orthodox imaginaries (Dey & Mason, 2018).

Signals of tensions may surface in various ways as shown across the three studies where relationality is the thread that draws attention to them. Often those tensions are already felt but remain unaddressed due to actors’ goodwill to make a started task succeed or due to political or power differences. To become aware of such tensions when acting within a situation, requires decoupling from the task one is

performing to observe, sense and even ask 'what is alive' in the system. Productively confronting tensions or discontent may be painful but proves helpful in the long run (Lauche & Erez, 2023). Human system dynamics theory emphasises that creative tension from significant diversity within a container of actors is an essential condition for change to occur (Eoyang, 2001, 2007), yet containment is required to endure the psychological discomfort it invokes. Study 1 shows how decreasing containment can lead to irreversible breakdown and consequential limited change, while Study 3 elicits how successful containment takes deliberate effort and continuous sensing.

Promote Stretching Sideways, Not Temporally Deep, to Elicit Inconceivable Patterns

Human tendency regards time as a line progressing from the past via the present into the future. Creatives, more than others, know however that the future is plural, unknown and unknowable. Nevertheless, in an organisational context, horizon thinking (Curry & Hodgson, 2008) sustains approaching the future dualistically instead of confronting multiple futures concurrently asserting agency on the present. Kyffin & Gardien (2009) explain how this is beneficial to navigating the innovators' dilemma from a market perspective safeguarding organisational survival. Yet, I argue that in the context of societal transformations it is more fruitful to scrutinise 'horizon 3' concepts, even if classified as preposterous, as horizon 1 and examine their implications for further temporally deep and systemically broad horizons. The practice of probing futures as described in this dissertation serves such critical examination in a continuous process of considering alternative futures to elicit invisible systemic patterns. Hence, probing futures is not an anticipatory practice to prepare contingency plans for futures that may or may not come, but a way of connecting with emerging alternative futures to produce and enact different future pathways than the current one. While anticipation is a responsive adaptive approach, the second is a proactive approach creating and adjusting in an ongoing present. This approach needs stretching sideways to decouple from current patterns and render visible what is usually not seen. Study 2 shows an example of probes stimulating such sideways stretching in Vignette 4 as well as a missed opportunity for sideways stretching in Vignette 5.

Support Organisational Frontrunners in expanding Probing Practices Across their Organisation

Study 1 and 2 reveal the challenges of continued practising a probing approach to future-making. Although actors in study 1 engaged at the start in a co-design partnership, increasing containment tensions lead to a breakdown. Study 2 elicits

the challenges when the practice is regarded a one-off intervention with input and output. In study 1 the breakdown prevented a further integration of the probing practice into existing organisational structures, which appears the better option compared to study 2 where substituting probing practices with analytical practices proved to difficult to reverse. This study reveals the inadequacy of attempts trying to 'sell' condensed insights about alternative values from probing to operational actors in the organisation. Such a normative approach is like telling people which values they should deem important. Probing exhibitions, on the other hand, enabled visitors to temporarily embrace imagined futures as if they were real, which in turn prompted values conversations. It can therefore be argued that future probes act as a kind of emotional scaffolding, facilitating a relational connection to the subject in question on an emotional level, which forms a basis for reflecting on a rational cognitive level. Similarly, study 3 elicits how emotional bonding with alternative possibilities was aroused by the frontrunners' relational scaffolding practices not by abstract text or talk trying to provide cognitive scaffolding to stretch imagination towards alternative futures. The more concrete alternative futures get, the more likely they are taken seriously (Augustine et al., 2019), yet the three studies in this dissertation emphasise the need for profound emotional relationships with a given situation to instigate action that may lead to societal transformation.

5.4.3 Implications for Education

A probing approach to future-making is relevant for educator guiding students in addressing complex societal challenges and uncertain futures. As students in higher education are increasingly confronted with such complex real-world assignments, the role of educators needs to shift from standing in front of the class to collaborating with students and the practical field.

In studies 1 and 2 students played a significant role guided by educational staff. While the students were praised for their creative contributions, the role of educators was blurred. On one hand, they tended to protect 'their' students against demands from the client organisation, while on the other hand, they challenged the students to exceed demands, particularly in terms of stretching imagination. Handling this ambiguity, which can be confusing for the students, requires educators to reconfigure their practice beyond merely alternating such roles. Particularly educators to whom the practice of probing futures was new, tended to guard a more traditional expert role as educator. This conflicts with the inquisitive practice of probing futures that aims to search for what is *not* known.

An instructor-student relationship is untenable to make a functional and productive relationship in the triangle between student, organisation and educator. Complex systemic challenges need enabling guidance instead of expert guidance. Herein is inherent that teachers themselves participate in the learning process alongside the students and organisational actors. From relational equality, all participants bring their expertise and experience to the challenge. For the educator specifically, I suggest this entails know-how of learning processes and affinity with boundary processes. It is advantageous for educators to be aware of different meanings of boundaries to education (Akkerman, 2011) and to organisations. From an educational perspective, boundaries between practice and school offer rich learning environments, but to organisations boundaries may be erected to protect territories (Langley et al., 2019). Such understanding is beneficial to position students strategically for learning and collaborating interdisciplinary (Kaplan et al., 2017).

As to the specific practice of future probing and its focus on creating experiential encounters with the future, an interest in more transdisciplinary learning approaches such as embodied learning (Allen et al., 2023) could leverage learning in the context of complex societal challenges. Embodied learning recognises that learning is not purely cognitive but involves bodily experiences as well. The probing practice specifically addresses the emotional relationship and visceral responses people may become aware of while experiencing such future encounters. Further research might explore how such encounters support understanding complexity from within rather than cognitively reflecting from a distance.

5.5 Methodological Journey and Directions for Further Research

During my first paper development workshop at the Process Research Organisation Studies (PROS) symposium in 2019, the renowned scholar hosting my round table suggested I should decide whether I wanted to be a consultant or a scholar. I expressed my aspiration to be a scholar, but inside I secretly thought I could be both. Reflecting on my methodological journey, I can only conclude that I am reaching the end of an engaged scholarship journey (Van de Ven, 2007). The research was motivated by the practical challenge of connecting alternative future imaginations with present action, which I had experienced cooperating as a co-design researcher cooperating with domain professionals and creative students and professionals. Following a hunch that the practice of probing futures

challenged traditional perspectives on anticipating and managing the future, such as forecasting and foresight, but not quite sure how, it was important to gain a deep pragmatic understanding (Farjoun et al., 2015) of how the practice of probing alternative futures produces and enacts the future.

At the time, I was not yet aware of the emerging stream of literature on future-making practices (e.g., Wenzel et al., 2020) as I focused on the discourse on innovation and the 'complexity leadership framework' (Uhl-Bien & Arena, 2017). Although the actors in my cases mostly called themselves innovators, I found the future-making lens more appropriate to the phenomenon under study. The reason for organisations to engage in future probing was not to discover innovations to be implemented, but to innovate their current practices. The future-making lens enabled me to see that more clearly and to distinguish probing futures as a distinct future-making practice influencing how the future is produced and enacted, not an innovation practice aiming to implement novelty. The work of Uhl-Bien and Arena remained useful as it allowed me to recognise that the explanation for the phenomenon must not be sought in people's cognitive inabilities but in relational aspects.

The role of an engaged scholar enabled me to study the practice of probing futures up close and personal, and through the performative and discursive practices of those involved (Nicolini, 2012). As anticipated by the questioner at PROS, this was not an easy journey, as it involved many methodological choices and reflexivity of my role as a researcher. My role fluctuated between being among reflective practitioners reflecting in action while observing the probing practice from within and reflecting on action afterwards (Schön, 1992b), and distancing myself as a researcher reflecting on reflections retrospectively. Below I reflect on the main methodological considerations that crossed my path in continuous deliberation with my supervisors respectively embedded in the research practices of co-design and organisation studies. Reflecting on the methodological journey, I perceive the alternations between engaged and distanced perspectives as methodological choices in response to the situation at hand as indicated by the numbers in Figure 13. I have used the concepts of first, second and third-order change (Bartunek & Moch, 1987) as an analytical tool for my methodological reflection to highlight how the methodological choices relate to the observed research situation.

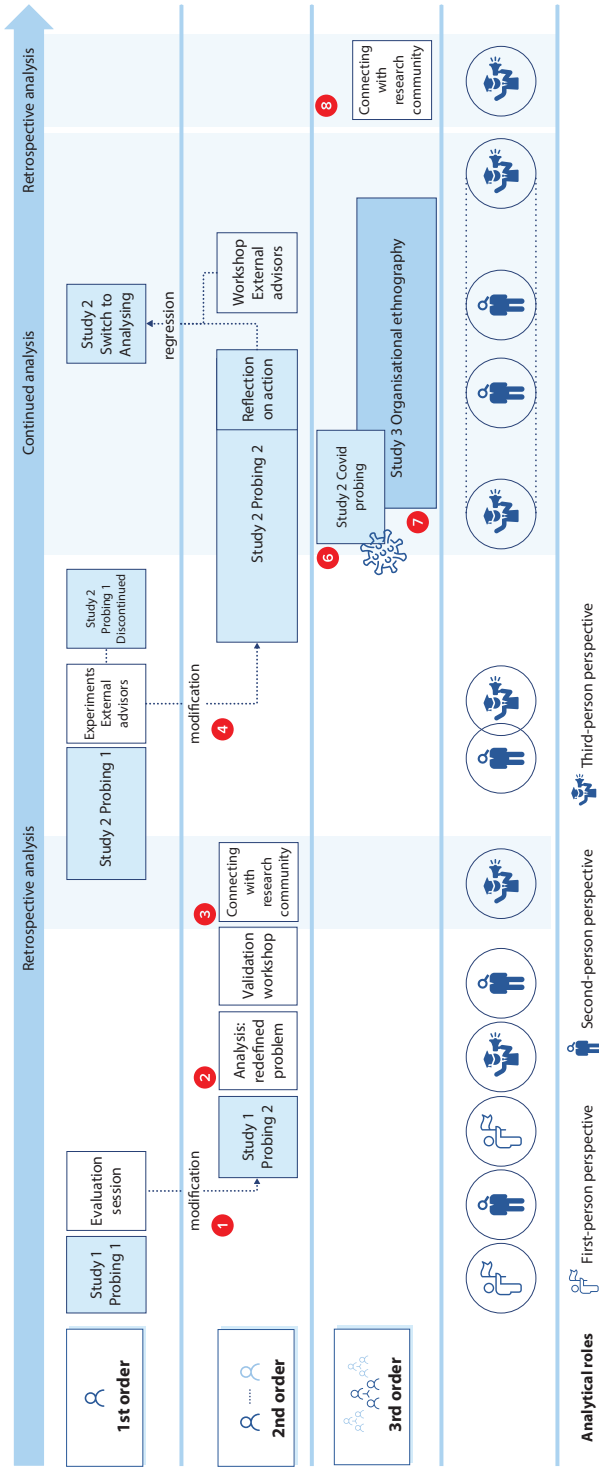


Figure 13 - Representation of the methodological journey

5.5.1 Integrating First, Second and Third-person Perspectives

The data for the first study were gathered when I was involved as a co-design researcher leading the probing events based on previous experience (Figure 13, No. 1). This project had started as a first-order change bringing the practice of probing futures inside the organisation assuming 'the buzz' would automatically attract employees to get involved, which would reinvigorate their innovation mindset. For a week the students, my co-design colleague and I practically lived there, while before and after I had frequent meetings with the organisation's initiators. This engaged perspective gave me insights based on my own experience practising future probing and reflecting in action, and from deliberations with others afterwards reflecting on action (Schön, 1992b).

At the time, I also analysed interviews with participants that a fellow co-design researcher and I had conducted midterm and at the end of the trajectory and connected with leadership and adaptability literature to redefine and contextualise the problem in terms of connecting innovation and operation networks (Figure 13, No. 2). I became more engaged again when reflecting on the findings and feeding them back to the actors involved during a validation workshop as described in Study 1.

My role as PhD researcher helped me connect to existing and emerging research communities through literature and conferences (e.g., Figure 13, No. 3 & 8). I distanced myself further from the events I had been immersed in and related my observations and reflections to the existing literature by using sensitising concepts (Bowen, 2006) to be able to interpret what this was a case of. In the beginning of Study 1, I struggled with this distancing as my contemplations on the coding were aimed at improving future probing as an intervention method figuring out what 'I had done wrong' rather than understanding it as a practice that I had cooperated in with the others. In other words, I was trying to come to terms with integrating a third, second and first-person perspective (Torbert, 1998) which aligns roughly with Schön's (1992b) reflection in action, reflection on action, and reflection on the reflection.

Reflecting on my roles during the probing case in study 1 enabled me to understand how at the micro level participants' behaviour and interactions shaped the unfolding of the probing practice, including my own. First-person reflection in action made me aware of how I continuously finetuned what needed to happen by sensing the situation (Yanow & Tsoukas, 2009). For example, while coaching students, I sometimes sensed that they needed more time to develop their tangible

probes or that additional support was required to enhance their stretching ability. I responded by changing the deadline and flying in an educational coach for guided storytelling. Second-person reflecting on action during an evaluation session, I gained a better understanding of how the practice was experienced by the organisation and related that to my own experiences. For example, I realised that my preoccupation with the students aiming to deliver surprising probes suppressed my alertness to the consequences for the employees who had been expecting student visits at specific moments. Such observations led to second-order modification of the probing practice (Figure 13 No. 1). Taking a distanced role as a typical PhD researcher enabled me to interpret from a third-person perspective why the probing practice had not achieved the third-order change intended, despite the shift from content-focused strategies to attract employees to prioritising relational connections. This second-order change involved leveraging informal employee networks but faced resistance when proposing to involve other stakeholders as well, which would have been a third-order modification. Despite continued efforts to refine the practice of probing alternative futures, the project's termination prevented third-order transformations. Study 1 highlights four tensions that strain relational connections and the containment of different perspectives on futures.

In Study 2, after consulting with my supervisors, I distanced myself further during probing trajectories with the students to avoid the trap of becoming too engaged to observe. The case organisation also offered the opportunity to monitor the follow-up in the organisation through organisational ethnography (Figure 13, No. 7). Study 2 started as a first-order challenge – i.e., the organisation 'ordered' a concretisation of the weak signals picked up in society. Similar to Study 1, it also underwent a second-order modification (Figure 13, No. 4) as the external advisors proposed to align probing activities with internal organisational processes, which launched the second iteration. Afterwards, there was a regression to first-order thinking as the organisation started analysing rather than probing (Figure 13, No. 5). Attempts of the external advisors during the workshop to regain second-order thinking and continue probing failed. I was able to witness these follow-up events because of engaging in organisational ethnography – due to the pandemic mainly online. The pandemic circumstances proved beneficial to the probing practice, which allowed me to observe a third-order change and exaptive practice (Figure 13, No. 6) that I would not have seen otherwise.

Study 3 had initially been planned as a follow-up of Study 2 to follow the tangible probes as the team had envisioned taking them on a tour across the organisation.

This would have enabled me to study how alternative future imaginations were linked to everyday future-making practices and vice versa. When it became clear that the tour would not take place, I was in search of practices that succeeded in making third-order change by connecting alternative futures with present action. In consultation with my supervisors and understanding that the practice of probing futures was new but resembled other future-oriented practices of the team involved in Study 2, I decided to proceed with the organisational ethnography (Figure 13, No. 7). Soon after the agreement, COVID-19 reached the predicament 'global pandemic' with the known restrictions resulting in the team's practices moving online.

Distancing myself helped conceptualise the challenge of linking alternative future imaginations and daily future-making as a challenge of the interplay between mutually constitutive processes rather than a unidirectional influence. It also enabled me to conceptualise the lack of imagination and stretching as a systemic issue that not only involves cognitive limitations induced by past experience but also relational aspects that I conceptualised in all three studies as pull-to-order forces. While distancing in Study 2 was beneficial to my development as a researcher, in hindsight, I am not sure it was advantageous to the organisation, as I may have withheld explanations of the working principles of the probing practice that might have influenced their decisions. On the other hand, as I was still in the process of understanding these working principles myself, I could have conveyed conflicting messages mixing unintended substantive, linear perceptions of possible futures and intended processual, non-linearity. While Study 1 set out to explore cognitive relating between alternative future imagination and present action along content lines, it particularly highlights how this is significantly challenged along relational lines. The choice to emphasise relationality became explicit during analysis in Study 2.

5.5.2 Integrating a Relational Perspective with a Cognitive Viewpoint

Distancing in Study 2 by taking a third-person perspective, traditionally associated with objectivity (Torbert, 1998), in my case entailed leaving the lead in the practice of probing futures to educational staff. As such, maintaining a third-person perspective enabled me to observe the surprising sequence of events that differed from the expected 'following the probes travelling through the organisation to instigate conversations'. The unfolding of these events shifted my gaze to the relationality in future-making, revealing my bias to see future-making only as a cognitive, substantive effort focusing on the persuasive content of imagined futures. This was in stark contrast to my perception of how future probing works. I consider the content of probes less important than their capacity to look at

practices, institutions and patterns in today's world with fresh eyes. There are no truth claims to be made, only dilemmas to inquire.

One significant event was the switch from probing to analysing (Figure 13, No. 5), which was interesting as from a practice perspective it invokes a whole other series of activities than expected and from a phenomenological perspective reflects a recurring action pattern in organisations. In my analysis, I focused on the practice perspective in terms of consequential activities and challenges, but recognising it as a phenomenon pushed me to interpret it through a relational lens. This decision was driven by personal interests but also by the recurring observation that relating alternative future imaginations with present action along content lines remained challenging given the anxiety such estranging imaginations tend to invoke. If cognitive relatability is at stake as with estranging alternative futures, what then? While other scholars have explored within the cognitive paradigm, suggesting for instance narrative temporal reorganisation to restore relatability (Rindova & Martins, 2022) and activist entrepreneuring to overcome a collective lack of imagination (Dey & Mason, 2018), I saw an opportunity to explore connecting along relational lines (Figure 13, No. 8).

The other significant event was the pandemic, which caused previously imagined futures to converge with reality. The restrictive circumstances rendered barely conceivable future worlds plausible overnight dissolving cognitive limitations to people's imagination. Viewed from a relational perspective this incident instantly increased people's awareness of future possibilities. It urged them to reconsider personal values and identities, relationships with loved ones and with the larger society or even global systems, such as clean air and water. Seeing the potential of future probing to act in a similar way as a performative theatre (Foverskov, 2020), further drew my attention to a relational perspective (Figure 13, No. 8).

Once I saw how well relationality fits with the probing practice and started to conceptualise the problematic lack of imagination as a challenge of resisting pull-to-order forces, I recognised my own bias. Conversations with my supervisors at the time revolved around a probing approach to future-making being the start of a journey without a clear destination. Along the way, people will join and disengage in telling and 'doing' stories – e.g., through experiential probes – to which others may or may not align their stories. The stories draw attention to content and cognitive relating. Yet, relationality adds to this view the idea that people join a 'travelling' group because of who is in it or because the group listens attentively to your stories and you feel being heard. This also suggests that content – stories and

future probes – does not have to be convincingly desirable, but should relate to real dilemmas people struggle with in everyday life and suggests openings for caring and compassion. As such, I regard adopting a relational perspective not merely an analytical lens, but a fundamental methodological choice inherent in the probing approach to future-making proposed in this dissertation (Figure 13, No. 8).

5.5.3 Directions for Further Research

Grappling with the three perspectives made me aware of my own intricate entanglements with the research environments, my roles and the unfolding phenomena, especially when trying to write up linearly what in my head was this perfectly coherent network of observations, interpretations, emotions and sensations. Every interpretative claim evoked multiple nuances and condensing them seemed to do injustice to the holistic viewpoint I tried to maintain. Accepting that this is inherent in doing research, deliberating with my supervisors and others and making transparent choices helped me through. It also enabled me to see the value of engaged scholarship and action research in which the voice of those ‘entering the zone of discomfort’, including the researcher, is active rather than interpreted by the researcher. In particular the notion of ‘witness’ seems to be helpful to further our understanding in this respect. A ‘witness’ perspective in research recognises that “a true process perspective places the researcher him or herself in flux along with and in direct relation to the researched” (Fachin & Langley, 2018, p.23). While this implies that researchers are ‘living forward’ together with their objects of study discovering the potentialities of evolving experiences (Weick, 1999), it also implies a need for attending to mutually reinforcing development processes between researchers and research object and subjects. I referred to this in my dissertation as cultivating awareness amidst or within complexity. Research taking a ‘witness’ approach is limited (Fachin & Langley, 2018). This might have something to do with the difficulties of experiencing as researcher the phenomenon that one is studying as I described above *and* being aware of it *and* distancing oneself to interpret it, which simultaneously causes ‘it’ to be gone making it difficult to grasp. ‘Witness-thinking’ as put forward by Shotter (2006) represents the ‘action guiding’ function of subsidiary awareness that helps someone sense what might happen next, which is very important for everything that happens afterwards. One of the key arguments in this dissertation is that a probing approach to future-making offers means to perform the future as it emerges while taking into account alternative inroads that mostly remain invisible or are taken-for-granted. Relating this argument to my understanding of ‘witness’, ‘living forward’ and ‘subsidiary awareness’, I envision future research to develop along two lines.

One research line is to further our understanding of relational approaches to addressing societal grand challenges and uncertain futures (Bartel & Rockmann, 2023; Ergene et al., 2021; Garud & Gehman, 2012). As I have unveiled some of the difficulties and pitfall that adopting a probing approach to future-making entails, I suggest to intensify studying how organised groups addressing complex challenges adopt this practice in different contexts and settings. Taking notice of these pitfalls, studies could discover how organised groups of people can take precautions to recognise, anticipate and adjust processes while in progress. I also suggested the establishment of an as-if real realm and relational scaffolding as prerequisite to building cognitive structures, which requires further investigation. How does one establish such an as-if real realm without the exogenous context of a crisis? As I see living labs differing from the adaptive as-if real realm I suggest, further research could compare such differences and their impact on addressing grand challenges. Research shows that Urban Living Labs (ULL) often revolve around a core group and a strong inner circle with a shared future vision and weak connections with the outer circle in the societal system (Puerari et al., 2018). The as-if real realm based on the concept of adaptive space connecting innovation with operation in organisations (Arena et al., 2017) invests in mobilising ideas and future perceptions bottom up, which compares to ULL's outer circle. Puerari et al. (2018) also found that motivation to participate depended largely on ownership and personal fulfilment, which one may recognise from dealing with change during the pandemic oneself. This pleas for the study of relational approaches that tap into people's perceptions of their own future as a starting point for stretching their imagination instead of attracting people with a strong vision. In light of societal grand challenges, it would be interesting to engage such studies in a transdisciplinary manner, involving diverse groups of people including but not limited to citizens, policy makers, incumbents, entrepreneurs, creatives, social movements and non-human entities. While interesting research to involve more-than-humanity and perhaps decenter the human – as opposed to human-centered design and engineering of the last century – is already developing in the fields of design and future studies (Coskun et al., 2022; Hakio et al., 2022; Nicenboim et al., 2020), such studies could benefit from organisation theoretical perspectives, particularly process research taking a 'witness' approach (Wegener & Lorino, 2020).

Another research line I suggest focuses on the content of probes. As the constant pull to order revealed in my studies suggests, stretching imagination is inherently difficult for humans. Artists, however, are thought to be better able to endure ambiguity and uncertainty, which makes them better suited to develop future probes that open up genuinely alternative inroads into the future. Working

with artists to develop highly speculative probes more generally and creating encounters with a wide audience serves another purpose of experiential probes, namely to serve as acclimatisation devices to help people get accustomed to unsettling ideas, such as wearing compostable garments associated with olfactory disgust (Ivanova, 2022). I suggest transferring this approach from its usual artistic context inhabited by artists and art lovers, such as museums, to more accessible environments inhabited by the common crowd, such as schools, community centres or public libraries. This would invite researchers to study how this 'accommodation process' evolves over time and how artist impressions shape and get shaped by the mundane.

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Summary

Future-making refers to how people and organisations prepare for and shape what is to come. It is the work of imagining, interpreting, negotiating and shaping desired futures while recognising that the future may unfold differently than expected. People have always been guided by imagination, from kings in ancient times seeking counsel from oracles to imagining automated futures at the 1939 New York World's Fair. Imagination spurs action, but also limits what one can imagine. However, the future often develops beyond the collective imagination through unforeseen twists and turns.

This tension is particularly salient in the context of societal challenges such as climate change, resource depletion and social inequality. Organisations in the global north are still thriving on practices that have brought prosperity but do not help address such complex, value-laden challenges. Fossil fuel is being replaced by lithium batteries, farmers are being bought out to build houses in expected flood-prone areas, refugees lack adequate shelter and young people face uncertain careers paths while having to deal with mounting (student) debt. Is this due to a lack of imagination or is there more to it?

Organisations play a crucial role in addressing complex grand challenges. They mostly rely on linear thinking, but thereby limit their imagination to conventional futures and ignore insights from complexity theory that recognises the uncertain, plural and open-ended nature of the future. This limited linear perspective often leads to ineffective strategies aimed at incremental change within existing paradigms. For deep systemic transformation, unconventional imagination is essential, but organisations struggle to align their actions with it. Organisations must manoeuvre between the pull of imagined futures for change and the pull for order and control to preserve stability. As organisations continue to grapple with complexity and uncertainty, researchers are calling for a better understanding of how organisational practices shape the future.

Despite a better understanding of how organisations engage with complex challenges, it remains underexplored how organisations and actors imagine and construct alternative futures as part of this future-shaping process. There is a renewed focus in the organisational literature on how organisations produce and enact the future, and researchers criticise disconnected dualistic approaches, such as calculative forecasting and scenario planning. Instead, perspectives on future-making, are shifting towards integral practices that unify the future and the past

in present situated activity. Nevertheless, scholars often overlook the influence of deficiencies in imagination and the role of pull-to-order forces in realising alternative futures paths.

Most research theorises how imagination and shared visioning can reduce the openness of the future and direct courses of action. Recent literature distinguishes the guiding potential of near versus distant futures, projection versus imagination and orthodox versus possible futures, and advocates for imagination that opens up alternative pathways into the future. Empirical research on how organisations take responsibility for their imaginative work in the face of societal challenges is limited, whereas that is where divergent imaginative work is needed. In this thesis, I problematise the lack of imagination and the tendency towards manageable futures. This research unlocks the connection between what actors say and do, their future imaginations and organisational structures to develop theories on future-making, recognising that the impact of their actions may not become apparent until much later and may remain invisibly to us.

Research Context and Approach

This research aims to understand how organisations explore the future to act differently today despite uncertainty about future developments and against the backdrop of complex societal challenges. From a practice perspective (Nicolini, 2012), it considers the future as a combination of past experience, imagination, negotiation and current reality. Focusing on the interplay between imaginative work and future-making practices the research is guided by the research question:

How does imagining alternative futures shape and get shaped by future-making practices?

To answer this question, the first two studies examine 'probing futures' as a specific future-making practice from an engaged science perspective (Van de Ven, 2007). The first study involves a retrospective analysis of data obtained as an observing participant at a Dutch digital service provider for education and research. A group of frontrunners cooperated with co-design researchers, educators and students on the exploration of future education and digitalisation. The second study consists of iterative analyses of data gathered during real-time observations of a group of actors at a public organisation in the Netherlands. Here a group of frontrunners cooperated with educators and students, while the follow up was part of organisational ethnography. The third case study comprises an organisational ethnography (Ybema et al., 2009) in the same public organisation, examining a

wider range of futures formation in which 'probing futures' of the second case study was embedded. The scope of the third study is thus broader, as the two 'probing' studies underexposed how actors successfully bridge the gap between imagining alternative futures and everyday future-making, without a crisis as a helping tipping point.

Probing futures aims to spark unexpected possibilities for current action by introducing imagined alternative futures. Provocative conceptual artefacts or 'probes' stimulate dialogue and imagination about possible futures. Examples include a smart glove for cyclists that combines data on emotions to guide them through busy cities or a medical drone for routine home health checks. Probing futures works with three steps: probe - sense - response. 'Probe' involves probe development and organising encounters, 'sense' involves observing reactions and reflecting on emerging patterns, and 'respond' focuses on appropriate follow-up actions. Probes are artefacts from the future that estrange the context of a familiar environment and elicit intuitive reactions and dialogue. They are not intended for practical implementation, but unlock alternative value orders to evoke immediate emotional responses. By exploring them, the aim is to unlock alternative courses of action and possibly initiate change. Probing futures thus makes visible patterns that were collectively not seen before.

Empirical chapters

Study 1 highlights containment challenges around enduring continuous provocation of rational thinking during probe development, cooperation and sustained trust. Study 2 reveals the challenges in conducting values conversations around future probes necessary for bridging future imaginations and alternative future-making practices. Study 3 demonstrates how cognitive and relational scaffolding practices support enduring discomfort and aligning future perspectives to take action.

Study 1: Containment tensions in probing alternative futures

The aim of Study 1 was to better understand how organisations deal with the challenges in imagining and connecting alternative futures with everyday future-making practices. The research question was: Why is it challenging to imagine and connect alternative futures with everyday future-making practices? By retrospectively looking back at previously collected data from a practice theory perspective, we gained a better understanding of the practice of 'probing futures' and were able to answer the question.

Future probing focuses on enduring different perspectives on the future and creating conditions for emergence rather than rapidly converging to a shared vision. Enduring psychological discomfort is essential for exploring alternative futures that prompt critical reflection on current practices and patterns of interaction. The research shows that imagining alternative futures is complicated by a dualistic perception of the future that varies along time horizons. A probing approach to future-making is then difficult, as it aims to unite possible futures with past and present experiences.

The study underscores the significance of remaining vigilant towards early relapses into probabilistic instead of possibilistic thinking. Cultivating and engaging with the tension between imagined alternative futures and current practice is necessary for deep transformative change. Probing non-linear, alternative futures experientially encourages active engagement and invokes intuitive, embodied responses prior to rational cognitive sensemaking. These responses often reveal surprising alternative viewpoints worth exploring further. If probes do not deviate enough from the status quo, one of the conditions for emergence is not met and little will transform. If probes do estrange the familiar sufficiently, creative tension may arise that can be exploited or not.

The study provides an empirical model explaining how organisational order responses like accountability, risk avoidance, and solution orientation, introduce unwanted tensions. These *containment tensions* emerge from differing cooperation approaches, varying levels of trust, timing issues, and the integration of exploration with regular tasks. Such tensions can be contained by enabling activities such as stimulating group cohesion, brokering, linking up and bridging which create a sense of togetherness. This causes unfamiliar future probing practices to be endured and estranging future probes to be scrutinised.

It becomes difficult to handle 'containment' tensions when organisational structure reactions, such as accountability or agenda-driven behaviour, take over. When tensions persist, trust in the approach suffers. This puts further tension on facilitating group cohesion and belonging which also makes it difficult to tolerate divergent future perspectives. Containment tensions hamper stretching towards genuinely alternative futures and engaging with a probing approach to future-making, which can culminate in a breakdown of cooperative efforts.

Study 2: Future-making: Imaginative work and values conversations

Study 2 expands our understanding of the role of values conversations in connecting alternative futures imagination and everyday future-making practices. The research questions was: How does imagining alternative futures shape and get shaped by values conversations in future-making? Central in this study was a probing trajectory similar to study 1, but this was continued by monitoring the follow up with the organisation. The research reveals how future probing practices evolve in three realms of future-making, each presenting unique challenges to conducting values conversations. These included enduring discomfort in the irreal realm, connecting lived experience in the real realm, and rehearsing with the trouble in the as-if real realm.

The irreal realm refers to both the inspirational environment where probes are developed away from the hurly-burly of office life and the opening up of possible alternative worlds when experiencing and discussing probes. In the real realm, the probes were to confront reality through values conversations close to daily practice. This did not take place, among others due to the pandemic situation, but it also appeared too unpredictable. Conversations about the probes and insights yielded did not resonate much in the real sphere, and follow-up experiments were not pursued. This changed when pandemic measures created conditions of a temporarily different reality, the as if-real sphere. I showed how this broke the deadlock created by dodging values conversations in the real sphere.

The analysis of activities within the realms revealed mechanisms realms that fostered values conversations and others that hindered values conversations. Those fostering values conversations were stretching imagination sideways, embracing provocative future possibilities, and adapting to new situations. Those hindering values conversations were including self-censoring, dodging values conversations, and mere surviving. I argued that such obstacles originated in organisational order responses.

There are several explanations for dodging values conversations in the real realm. First, there is a tendency to switch from probing to analytical cycles before emergent patterns become manifest. Second, making sense of the implications of probing for operational practices requires sufficient know-how and experience of both. Third, the transition from the 'safe' irreal realm, under the radar of opinions, to the confrontational real realm is challenging. These challenges require *empathetic interaction* to prepare 'soft landings' on the relational level for the challenging content of alternative futures.

In analogy of the pandemic conditions, an as-if real realm was suggested to make the step from an irreal realm to the real realm smoother. This realm can serve as an adaptive space in which the tension between divergent and convergent processes can be leveraged. This requires enabling activities and connecting along relational lines, like in Study 1, to build strong networks or ecologies. Working with actives and attractives can help involving actors. Instead of relying on selling tactics to promote the adoption of insights or practices that recipients may find difficult to grasp, this stimulates self-learning and generate systemic ripple effects. These insights are synthesised into a model showing relations between the three realms, the challenges due to competing mechanisms and those imposed by pull-to-order forces.

Study 3: Shaping the interplay between emerging alternative possibilities and present realities: relational and cognitive scaffolding practices

The aim of Study 3 was to gain a deep understanding of actors' deliberate efforts shaping the interplay between possible alternative futures and present realities. As successful bridging between alternative future imaginations and present action was underexposed in the probing studies, Study 3 widens the scope to future-oriented practices in which the practice of probing futures of Study 2 was embedded. Theorising builds on the insight gained through Studies 1 and 2 guided by the following research question: How do actors shape the interplay between emerging alternative futures and present realities?

Study 3 shows in an empirical model how *cognitive scaffolding practices* render conceivable a broader palette of possibilities and enable individuals to relate to diverse perceptions of the future and *relational scaffolding practices* help endure the associated psychological discomfort and transcend current ways of future-making. This study highlights how alternative futures imaginations challenge people's current practices inviting them to become critical inquirers while supporting them in stretching their imagination to a wider range of possibilities. The findings show how different scaffolding routes run simultaneously bringing together different interaction patterns. Relational scaffolding practices provide a basis for cognitive scaffolding to break habitual thought patterns, crucial to converge unrealised future potentials until their manifestation results in the collapse of current reality creating a novel reality.

Cognitive scaffolding begins with introducing new technological or social signals into the organisational discourse. Proactively envisioning alternative futures, assessing readiness, and aligning with organisational goals serve as initial

scaffolding to engage employees and offer opportunity to align and contest diverse future perceptions. Envisioned futures stretch imagination while emerging narratives link imaginative work with daily practice. In an early stage, this focuses on agenda-setting and collaboration. As abstract ideas become concrete, field partners are sought to explore implementation feasibility and impact. However, cognitive scaffolding faces challenges related to emotional discomfort and practical concerns that hinder alignment. Relational scaffolding aims to contain profound transformational discomfort related to organisational and personal identities. Confronting practical concerns with an empathic understanding supports cooperative and doable courses of action.

Theoretical Contributions

From this dissertation, probing futures emerges as a unique approach to future-making, fostering emergence and self-organisation. The insights gained on containment challenges during stretching imagination towards possible alternative futures, the role of empathic interrelating to stimulate values conversations, and the need for relational scaffolding as a prerequisite to cognitive scaffolding in enduring and aligning diversity of future perspectives have several theoretical implications outlined below.

First, a probing approach to future-making stresses that imagining alternative futures tangibly and experientially *is* future-making rather than producing knowledge to subsequently inform intended future-making pathways as previous scholars have emphasised. A probing approach to future-making furthers our understanding of future-making by discovery contrary to future-making by design. By generating creative tension to enact emergence (Lichtenstein, 2014) future probing provokes discovery rather than waiting for spontaneous unforeseen or unintended circumstances to respond to (Golden-Biddle, 2020). Future probing offers a way to provoke and leverage differences within a system to instigate change processes without a priori knowledge about their end state. While other approaches emphasise the need for abstract visions or imagination of a desirable or preferred future to direct teleological pathway development, probing futures builds on teleoaffective structures embedded in the practices it encompasses (Nicolini & Mengis, 2024). Hence, the practices and mechanisms highlighted in the three studies help actors and organisations to ‘perform’ their way forward while emphasising differences ensures a departure from an undesirable status quo.

Secondly, the three studies emphasise the importance of sideways stretching over the temporal deepening of prevailing economic values and motives,

typically employed by most firms (Beckert, 2021). Stretching sideways challenges assumptions and conventional thinking about how the future is expected to develop by generating perturbing parallel worlds or alternative scenarios using analogies and metaphors from unrelated fields or domains. While temporal stretching can help conceive unconventional future probes, experiential representations try to eliminate this time dimension as much as possible to trigger genuine and direct visceral emotional responses. These responses precede rational thinking reducing the need for pretence when bringing alternative future options into present future-making.

Thirdly, when starting to practice future probing both the content – unconventional future probes – and the process – a discovery approach – are unfamiliar which introduces various challenges that require containment. Containment refers to creating the group cohesion necessary to keep transformations in motion. Containing the togetherness of a group of actors in transformative change processes is more difficult in complex environments, such as addressing grand challenges or open-ended uncertain futures (Snowden, 2005). While a probing approach is appropriate in such circumstances (Kurtz & Snowden, 2003) sustaining trust in novel practices introduces containment tensions. Containment tensions signify organisational pull-to-order forces that strive for stability and control and resist transformational change. Study 1 reveals enabling activities that support resisting such pull-to-order forces. Study 2 recognises three different realms of future-making and suggests enabling an as-if real realm as an adaptive space between an irreal and the real realm to smoothen the progression of genuinely alternative future-making practices. Study 3 suggests relational scaffolding as a prerequisite to cognitive scaffolding. Relational scaffolding contains emerging emotional discomfort and confronts practical concerns to enable endurance and transcendence as a foundation for building cognitive structures for leveraging diversity.

Finally, the strong presence of relational aspects and the impact of relational deficiencies across the three studies indicates how probing futures – inquiring into alternative futures – produces and enacts the future *within* the dynamic interconnectedness of pasts, futures and presents ongoing interaction patterns in which “meaning, movement and emotions are inextricably linked” (Nayak & Chia, 2011, p.297). In doing so, this dissertation on probing futures to act differently today answers the call for more relational approaches and critical methods in researching grand challenges and the role of organisations and organising in them (Ergene et al., 2021). The section on relationality in Chapter 5’s overall discussion

argues how practising future probing is beneficial to developing ‘practical wisdom’ by opening up ‘conversation spaces’ (Durand & Calori, 2006) around future probes that invoke dialectics around ‘sameness’ and ‘otherness’.

Practical Implications

The practical implications of this dissertation are directed towards organisations, and creative agencies that guide them in imaginative work, and education. The implications for organisations are widely applicable. Firstly, my research explains how probing futures differs from traditional approaches to managing future portfolios of different horizons. Probing futures is about ‘doing’ futures to instigate acting differently today rather than ‘thinking’ about and preparing for far away futures that may or may not manifest themselves. It employs the understanding that one’s actions influence how the future unfolds and small action may cumulate into radical change. Future probing helps become aware of alternative courses of action through future probes and reflect on their consequences. It involves discovering which emergent patterns of interaction, previously collectively unseen, are worth strengthening. Hence, probing futures aims to generate emergence and self-organisation amidst complexity.

For example, considering that drones – or more speculative concepts – will eventually perform tasks in all capillaries of our organised life, what might that life in extrema look like and what does one need to do now to make that happen in the service of values one values? I call concretising what that might look like ‘pull to potentiality’. Such imagination puts pressure on current systems, or on how people are used to think and act in the present. Imagination is therefore challenging work that calls for containment or generating conditions that keep a group of cooperating actors together and help them tolerate tensions. This is necessary to stretch to genuinely alternative futures and not converge too quickly on one outcome, but keep open several possible paths towards the future.

Secondly, probing futures helps to overcome the lack of imagination by encouraging *sideways stretching* rather than far away in time. Students are a valuable asset in this regard because of their uninhibited creativity. They can act as a buffer when introduced alternative futures are seen as provocative or ridiculous. Sideway stretching *cultivates awareness* for diverse signals of change in the present as a trigger for abductive imagination, which does not unambiguously fit current ways of doing and thinking.

Thirdly, my research gives insight into the challenges of practising future probing. Like any other form of potential change, probing alternative future invokes pull-to-order forces that preserve the stability of a system. Because relating estranging alternative probes to daily future-making practices is cognitively challenging, *empathic interrelating* is important to connect along relational lines. This creates space for dialogue and diversity around the trouble that comes with transformation. The cognitive dissonance and sense of discomfort evoked by significant difference between the new and the old is then instrumental in seeing genuinely alternative possibilities.

Samenvatting

Toekomstvorming – future-making – verwijst naar hoe mensen en organisaties zich voorbereiden op en vormgeven aan wat komen gaat. Het is het werk van verbeelden, interpreteren, onderhandelen en vormgeven aan gewenste toekomsten, terwijl men erkent dat de toekomst zich anders kan ontfouten dan verwacht. Mensen hebben zich altijd laten leiden door verbeelding, van koningen in de oudheid die raad zochten bij orakels tot het bedenken van geautomatiseerde toekomsten op de Wereldtentoonstelling van New York in 1939. Verbeeldingskracht zet aan tot handelen, maar begrenst ook wat men voor mogelijk houdt. De toekomst ontwikkelt zich echter vaak voorbij de collectieve verbeelding door onvoorziene wendingen.

Deze spanning is bijzonder duidelijk in de context van maatschappelijke uitdagingen zoals klimaatverandering, uitputting van hulpbronnen en sociale ongelijkheid. Organisaties in het mondiale noorden floreren nog steeds op praktijken die welvaart hebben gebracht, maar niet helpen om dergelijke complexe, waardengeladen uitdagingen aan te pakken. Fossiele brandstof wordt vervangen door lithium batterijen, boeren worden uitgekocht om huizen te bouwen in verwachte overstromingsgevoelige gebieden, vluchtelingen hebben gebrek aan passend onderdak en jongeren worden geconfronteerd met onzekere loopbanen terwijl ze moeten omgaan met oplopende (studie)schulden. Komt dit door een gebrek aan verbeeldingskracht of is er meer aan de hand?

Organisaties spelen een cruciale rol in het aanpakken van complexe maatschappelijke uitdagingen. Zij vertrouwen veelal op lineair denken maar beperken daarmee hun verbeeldingsvermogen tot conventionele toekomsten en negeren inzichten uit de complexiteitstheorie die het onzekere, meervoudige en open karakter van de toekomst erkent. Dit leidt vaak tot ineffektieve strategieën gericht op incrementele verandering binnen bestaande paradigma's. Voor diepgaande systemische transformatie is onconventionelere verbeelding essentieel, maar organisaties hebben moeite hun handelen daarmee te verbinden. Organisaties moeten manoeuvreren tussen de aantrekkingskracht van verbeelde toekomsten voor verandering en de hang naar orde en controle voor stabiliteit. Aangezien organisaties blijven worstelen met complexiteit en onzekerheid roepen onderzoekers om een beter begrip van hoe organisatie praktijken de toekomst vormgeven.

Ondanks een beter begrip van hoe organisaties zich bezighouden met complexe uitdagingen, blijft onderbelicht hoe organisaties en actoren alternatieve toekomsten verbeelden en construeren als onderdeel van dit toekomstvormingsproces. In de organisatieliteratuur heeft men opnieuw oog voor de wijze waarop organisaties de toekomst vormgeven en in praktijk brengen en onderzoekers bekritisieren dualistische benaderingen, zoals calculatieve forecasts en scenarioplanning. In plaats daarvan verschuiven perspectieven op toekomstvorming naar integrale praktijken die de toekomst en het verleden verenigen in het heden. Desondanks gaat men vaak voorbij aan de invloed van tekortkomingen in de verbeelding en de rol van 'pull-to-order' krachten bij het realiseren van alternatieve toekomstpaden.

Het meeste onderzoek theoretiseert hoe verbeelding en gedeelde visievorming de openheid van de toekomst kan verminderen en handelingsperspectief kan richten. Recente literatuur onderscheidt het richtinggevend vermogen van nabije versus verre toekomsten, projectie versus verbeelding en orthodoxe versus mogelijke toekomsten, en pleit voor verbeelding die alternatieve paden opent. Empirisch onderzoek naar hoe organisaties verantwoordelijkheid nemen voor hun verbeeldingswerk in het licht van maatschappelijke uitdagingen is beperkt, terwijl daar juist divergente verbeeldingskracht nodig is. In deze dissertatie problematiseer ik het gebrek aan verbeelding en de neiging naar beheersbare toekomsten. Dit onderzoek ontsluit de samenhang tussen wat actoren zeggen en doen, hun toekomstverbeelding en organisatorische structuren om theorieën te ontwikkelen over toekomstvorming, in het besef dat de invloed van hun handelen wellicht pas veel later duidelijk wordt en voor ons onzichtbaar blijft.

Sa

Context en Aanpak van het Onderzoek

Dit onderzoek beoogt te begrijpen hoe organisaties de toekomst verkennen om vandaag anders te handelen ondanks onzekerheid over toekomstige ontwikkelingen en tegen de achtergrond van complexe maatschappelijke uitdagingen. Vanuit een praktijktheoretisch perspectief (Nicolini, 2012) beschouwt het de toekomst als een combinatie van ervaringen uit het verleden, verbeelding, onderhandelingen en de huidige realiteit. Het onderzoek richt zich op de wisselwerking tussen verbeeldingswerk en praktijken van toekomstvorming en heeft als onderzoeksvraag:

Hoe geeft het verbeelden van alternatieve toekomsten vorm aan en wordt het gevormd door toekomstvormende praktijken?

Om deze vraag te beantwoorden onderzoeken de eerste twee studies “probing futures” als een specifieke praktijk van toekomstvorming vanuit een geëngageerd wetenschapsperspectief (Van de Ven, 2007). De eerste studie betreft een retrospectieve analyse van gegevens die waren verkregen als observerende deelnemer bij een Nederlandse digitale dienstverlener voor onderwijs en onderzoek. Een groep koplopers verkende samen met co-design onderzoekers, docenten en studenten mogelijke toekomstën omtrent educatie en digitalisering. De tweede studie bestaat uit iteratieve analyses van data vergaard tijdens real-time observaties van een groep actoren van een publieke organisatie in Nederland, deels in samenwerking met studenten en docenten. De derde casestudy omvat een organisatie etnografie (Ybema et al., 2009), die een breder scala aan toekomstvorming onderzoekt waarin de ‘probing futures’ was ingebed in de organisatie uit de tweede casestudy. De reikwijdte van de derde studie is daarmee breder, omdat de twee ‘probing’ studies onderbelicht laten hoe actoren succesvol een brug slaan tussen het verbeelden van alternatieve toekomstën en het dagdagelijks voortbrengen van toekomstën, zonder een crisis als helpend omslagpunt.

Probing futures heeft als doel onverwachte mogelijkheden voor huidige actie aan te wakkeren door verbeelde alternatieve toekomstën te introduceren. Provocerende conceptuele artefacten of ‘probes’ stimuleren de dialoog en verbeelding over mogelijke toekomstën. Voorbeelden zijn een slimme handschoen voor fietsers die data over emoties combineert om ze door drukke steden te leiden of een medische drone voor routinematige gezondheidscontroles thuis. Probing futures werkt met drie stappen: uitproberen - gewaarworden - reageren. ‘Uitproberen’ betreft probe-ontwikkeling en het organiseren van ontmoetingen, ‘gewaarworden’ behelst het observeren van reacties en reflecteren op opkomende patronen, en ‘reageren’ richt zich op adequate vervolgacties. Probes zijn artefacten uit de toekomst die hun de context van een vertrouwde omgeving vervreemden en intuïtieve reacties en dialoog uitlokken. Ze zijn niet bedoeld zijn voor praktische implementatie, maar ontsluiten alternatieve waardenordeningen om directe emotionele reacties op te roepen. Het doel is door deze te onderzoeken alternatieve paden te openen en eventueel verandering in gang te zetten. Probing futures maakt zo patronen zichtbaar die daarvoor collectief niet gezien werden.

Empirische hoofdstukken

Studie 1 verkent de uitdagingen met het hanteren van onzekerheid rond aanhoudende provocatie van rationeel denken tijdens probe ontwikkeling, samenwerking en het behouden van vertrouwen. Studie 2 toont de uitdagingen in

het voeren van waardengesprekken rond toekomstprobes die nodig zijn voor het overbruggen van toekomstverbeelding en alternatieve toekomstpraktijken. Studie 3 laat zien hoe cognitieve en relationele ‘scaffolding’ praktijken ondersteunen om ongemak te verdragen en toekomstperspectieven op elkaar af te stemmen om tot handelen te komen.

Studie 1: Spanningen hanteren in omgaan met alternatieve toekomst

Het doel van Studie 1 was beter te begrijpen hoe organisaties omgaan met de uitdagingen in het verbeelden en verbinden van alternatieve toekomst met alledaagse praktijken van toekomstvorming. De onderzoeksvraag was: Waarom is het uitdagend om alternatieve toekomst te verbeelden en te verbinden met alledaagse toekomstvormende praktijken? Door retrospectief terug te kijken naar eerder verzamelde data vanuit een praktijktheoretisch perspectief, kregen wij een beter begrip van de praktijk van “probing futures” en konden wij de vraag beantwoorden.

Future probing richt zich op het verdragen van verschillende perspectieven op de toekomst en het creëren van voorwaarden voor emergentie in plaats van snel te convergeren naar een eenduidige visie. Het verdragen van psychologisch ongemak is essentieel voor het verkennen van alternatieve toekomst die aanzetten tot kritische reflectie op huidige praktijken en interactiepatronen. Het onderzoek toont aan dat het verbeelden van alternatieve toekomst wordt bemoeilijkt door een dualistische perceptie van de toekomst die varieert langs tijdshorizonnen. Een probende benadering van toekomstvorming is dan lastig, omdat die beoogt mogelijke toekomst te verenigen met ervaringen uit het verleden en het heden.

Het onderzoek benadrukt het belang van waakzaamheid voor vroegtijdig terugvallen in probabilistisch in plaats van possibilistisch denken. Het cultiveren en aangaan van de spanning tussen verbeelde alternatieve toekomst en de huidige praktijk is noodzakelijk voor diepgaande transformatieve verandering. Het ‘proben’ van niet-lineaire, alternatieve toekomst middels tastbare ervaringen stimuleert actieve betrokkenheid en roept intuïtieve, fysieke reacties op die voorafgaan aan rationele, cognitieve betekenisgeving. Deze reacties brengen vaak verrassende alternatieve gezichtspunten aan het licht die de moeite waard zijn om nader te onderzoeken. Als de probes te weinig afwijken van de status quo is niet aan één van de voorwaarden voor emergentie voldaan en zal er weinig transformeren. Als probes wel voldoende vervreemdend zijn ontstaat mogelijk creatieve spanning die benut kan worden of niet.

Het onderzoek levert een empirisch model op dat uitlegt hoe organisatorische structuur-reacties zoals verantwoordingsplicht, risicovermijding en oplossingsgerichtheid, ongewenste spanningen met zich meebrengen. Deze *'containment' spanningen* ontstaan door verschillende benaderingen van samenwerking, verschillende niveaus van vertrouwen, timingkwesties en de integratie van exploratie met reguliere taken. Door faciliterende activiteiten zoals het stimuleren van groepscohesie, het verbinden van actoren, en een creëren van een gevoel van saamhorigheid zijn dergelijke spanningen te hanteren door de groep. Hierdoor worden onbekende probing werkwijzen volgehouden en de vervreemdende toekomstprobes serieus onderzocht.

Het wordt lastig *'containment' spanningen* te hanteren als organisatorische structuur-reacties, zoals accountability of agenda-gedrevenheid, de overhand krijgen. Bij aanhoudende spanningen lijdt het vertrouwen in de aanpak hieronder. Dit zet nog meer spanning op het faciliteren van de cohesie en saamhorigheid van een groep wat ook het verdragen van uiteenlopende toekomstperspectieven bemoeilijkt. *'Containment' spanningen* belemmeren het oprekken naar werkelijk alternatieve toekomsten en een *'probing' benadering* van het maken van de toekomst, wat kan uitmonden in een breuk in de samenwerking in de groep.

Studie 2: Toekomstvorming: Verbeeldingswerk en waardengesprekken

Studie 2 vergroot ons begrip van de rol van waardengesprekken in het verbinden van alternatieve toekomstverbeelding en alledaagse toekomstpraktijken. De onderzoeksvraag was: Hoe geeft het verbeelden van alternatieve toekomsten vorm aan en wordt het gevormd door waardengesprekken bij het vormgeven van de toekomst? In deze studie stond een vergelijkbaar probing traject plaats als in studie 1, maar werd ook het vervolg daarop binnen de organisatie gevolgd. Het onderzoek onthult hoe *'future probing' praktijken* zich ontwikkelen in drie sferen van toekomstvorming, elk met unieke uitdagingen voor het voeren van waardengesprekken. Dit zijn ongemak aangaan in de irreële sfeer, verbinden met doorleefde ervaring in de reële sfeer en oefenen met de moeite in de alsof-reële sfeer.

De irreële sfeer verwijst naar de inspirerende omgeving waar de probes werden ontwikkeld, weg van de hectiek van het kantoorleven, en naar het openen van mogelijke alternatieve werelden bij het ervaren en bespreken van probes. In de reële sfeer zouden de probes de confrontatie aan gaan met de realiteit door middel van waardengesprekken dicht bij de dagelijkse praktijk. Dit ging onder andere door de pandemie situatie niet door, maar bleek ook te onvoorspelbaar. Gesprekken over

de probes en opgeleverde inzichten sloegen weinig aan in de reële sfeer en er werd niet gestreefd naar opvolgende experimenten. Dit veranderde toen de pandemie maatregelen creëerde van een tijdelijke andere realiteit, de alsof-reële sfeer. Ik liet zien hoe dit de impasse doorbrak die ontstond door het ontwijken van waardengesprekken in de reële sfeer.

De analyse van activiteiten binnen de sferen onthulde mechanismen die waardengesprekken bevorderden, en andere die waardengesprekken belemmerden. Bevorderende mechanismen waren zijwaarts oprekken van verbeelding, omarmen van provocatieve toekomstmogelijkheden en adapteren aan de nieuwe situatie. Belemmerende mechanismen waren zelfcensuur, ontwijken van waardengesprekken en louter overleven. Ik beargumenteerde dat deze belemmeringen voortkwamen uit organisatorische structuur-reacties.

Er zijn meerdere verklaringen waarom waardengesprekken in de reële sfeer worden ontweken. Ten eerste is er de neiging om over te schakelen van probe-cycli naar analyse-cycli voordat emergente patronen zich manifesteren. Ten tweede is voldoende know-how en ervaring nodig om de implicaties van probing voor operationele praktijken te kunnen duiden. Ten derde is de overgang van de 'veilige' irreële sfeer, onder de radar van opinies, naar de confronterende reële sfeer uitdagend. Deze uitdagingen vragen om *empathisch interacteren* om 'zachte landingen' op relationeel vlak te prepareren voor de uitdagende inhoud van alternatieve toekomstmogelijkheden.

Naar analogie van de pandemie condities, werd de alsof-reële sfeer voorgesteld om de stap van de irreële sfeer naar de reële sfeer soepeler te laten verlopen. Deze sfeer kan fungeren als een verbindende 'adaptieve ruimte' waarin de creatieve spanning tussen divergerende en convergerende krachten kan worden benut. Daarvoor zijn faciliterende activiteiten en het verbinden langs relationele lijnen zijn nodig, zoals in Study 1, om sterke netwerken of ecosystemen op te bouwen tussen de sferen. Het werken met 'actives' – aanjagers – en 'attractives' – ervaarbare probes – kan helpen actoren te betrekken. In plaats van via overtuigen opschaling van inzichten of praktijken te bewerkstelligen, stimuleer je zo bij zelfleren en rimpel-effecten in een systeem. Deze inzichten zijn samengevat in een model dat de relaties tussen de drie sferen en de uitdagingen als gevolg van concurrerende mechanismen of getriggerd door pull-to-order krachten laat zien.

Studie 3: Vormgeven aan de wisselwerking tussen emergente alternatieve toekomsten en de huidige realiteit: relationele en cognitieve ondersteunende ‘scaffolding’ praktijken

Studie 3 richt zich op de bewuste inspanningen van actoren om de wisselwerking tussen mogelijke alternatieve toekomsten en huidige realiteiten vorm te geven. Aangezien succesvolle verbinding tussen alternatieve toekomstverbeeldingen en actie in het heden onderbelicht bleef in de probing studies, verbreedde ik de scope van Studie 3 naar toekomstgerichte praktijken waarin de future probing praktijk van Studie 2 was ingebed. De theorievorming bouwt voort op de inzichten die zijn opgedaan in Studies 1 en 2. De onderzoeksvraag luidde: Hoe geven actoren vorm aan de wisselwerking tussen mogelijke alternatieve toekomsten en huidige realiteiten?

Studie 3 toont in een empirisch model aan hoe *cognitieve ondersteuningspraktijken* – ‘scaffolding’ – een breder palet van mogelijke toekomstpaden aannemelijk maken en individuen in staat stellen om zich te verhouden tot diverse percepties van de toekomst, terwijl *relationele ‘scaffolding’ praktijken* helpen het bijbehorende psychologisch ongemak te doorstaan en de huidige manieren van toekomstgericht handelen te overstijgen. Deze studie benadrukt hoe verbeeldingen van alternatieve toekomsten de huidige praktijken van mensen uitdagen en hen uitnodigen om kritische onderzoekers te worden, terwijl ze hen ondersteunen om hun verbeelding op te rekken naar een breder scala aan mogelijkheden. De resultaten laten zien hoe verschillende ‘scaffolding’ routes parallel lopen en verschillende interactiepatronen bij elkaar brengen. Relationele ondersteuningspraktijken bieden een basis voor cognitieve ondersteuningsstructuren om gewoontedenpatronen te doorbreken, cruciaal om ongerealiseerd toekomstpotentieel te laten convergeren tot hun manifestatie resulteert in het instorten van de huidige realiteit waardoor een nieuwe werkelijkheid ontstaat.

Cognitieve ondersteuning begint met het introduceren van nieuwe technologische of sociale signalen in het organisatiediscours. Proactief verbeelden van alternatieve toekomsten, volwassenheid beoordelen, en afstemmen met organisatiedoelen dienen als initiële ‘scaffolding’ om medewerkers te betrekken en mogelijkheden te bieden om diverse toekomstpercepties bij elkaar te brengen en te betwisten. Verbeelde toekomsten rekken de verbeelding op terwijl emergente verhalen verbeeldingswerk verbinden met de dagelijkse praktijk. Dit is in een vroege fase gericht op agendavorming en samenwerking. Naarmate abstracte ideeën concreet worden, worden partners in het veld gezocht om de uitvoerbaarheid en impact van implementatie te verkennen. Cognitieve ‘scaffolding’ praktijken worden

geconfronteerd met uitdagingen rondom emotioneel ongemak en praktische zorgen die de afstemming belemmeren. Relationale ‘scaffolding’ praktijken beogen daarom diep transformationele ongemak van zowel de organisatorische als de persoonlijke identiteit te raken. Het confronteren van praktische zorgen met empathisch begrip ondersteunt coöperatieve werkbare handelwijzen.

Theoretische Bijdragen

Deze dissertatie beschrijft de probing benadering van toekomsten als een unieke wijze van toekomstvorming, waarbij emergentie en zelforganisatie worden gestimuleerd. De inzichten die zijn opgedaan over uitdagingen rondom *containment* bij het oprekken van de verbeelding naar mogelijke alternatieve toekomsten, de rol van *empathisch interacteren* om waardengesprekken te stimuleren, en de noodzaak van *relationele ‘scaffolding’ ondersteuning* als een voorwaarde voor cognitieve ondersteuning bij het verdragen en afstemmen van diversiteit in toekomstperspectieven, hebben verschillende theoretische implicaties zoals hieronder uiteengezet.

Ten eerste benadrukt een probing benadering van toekomstvorming dat alternatieve toekomsten tastbaar en ervaarbaar verbeelden, in zichzelf toekomstvorming is. In plaats van kennis produceren om vervolgens doelgerichte toekomstpaden te bepalen zoals eerdere onderzoekers hebben benadrukt. De probing benadering van toekomstvorming verdiept ons begrip van toekomstvorming door ontdekking in plaats van door ontwerp. Door creatieve spanning te genereren om emergentie te bewerkstelligen (Lichtenstein, 2014), lokt future probing ontdekking uit in plaats van wachten op spontane, onvoorziene of onbedoelde omstandigheden om op te reageren (Golden-Biddle, 2020). Future probing biedt een manier om verschillen binnen een systeem uit te lokken en te benutten om veranderingsprocessen op gang te brengen zonder voorafgaande kennis over het resultaat. Terwijl andere benaderingen benadrukken dat er abstracte visies of verbeeldingskracht nodig zijn van een wenselijke of voorkeursoekomst om de ontwikkeling van teleologische paden te sturen, bouwt future probing voort op teleo-affectieve structuren die verankerd zijn in de praktijken die het omvat (Nicolini & Mengis, 2024). De praktijken en mechanismen die in de drie studies worden belicht helpen actoren en organisaties om hun weg vooruit te vinden waarin het benadrukken van verschillen zorgt voor het loskomen van een ongewenste status-quo.

Ten tweede, benadrukken de drie studies het belang van zijdelingse oprekken boven het temporeel verdiepen langs heersende economische waarden en motieven, zoals wordt gedaan door de meeste organisaties (Beckert, 2021). Zijdelingse oprekken cultiveert het bewustzijn in het heden. Het daagt aannames

en conventioneel denken uit over hoe de toekomst zich zou moeten ontwikkelen door verstorende parallelle werelden of alternatieve scenario's te genereren met behulp van analogieën en metaforen uit niet-gerelateerde vakgebieden of domeinen. Hoewel oprekken langs de diepte dimensie van tijd kan helpen bij het bedenken van onconventionele toekomstprobes, proberen experientiele probes deze tijdsdimensie zo veel mogelijk te elimineren om oprechte en directe emotionele reacties op te roepen. Deze reacties gaan vooraf aan rationeel denken en verminderen de behoefte aan doen alsof wanneer alternatieve toekomstopties in het huidige toekomstvormingsproces worden gebracht.

Ten derde, bij het beginnen met future probing zijn zowel de inhoud – onconventionele toekomstprobes – als het proces – een ontdekkingsaanpak – onbekend, wat verschillende uitdagingen met zich meebrengt die 'containment' vereisen. Containment verwijst naar het creëren van de groepscohesie die nodig is om transformaties in beweging te houden. Het bijeenhouden van een groep actoren in veranderingsprocessen is moeilijker in complexe omgevingen, zoals het aanpakken van complexe maatschappelijke uitdagingen of omgaan met open en onzekere toekomst (Snowden, 2005). Hoewel een probende benadering geschikt is in dergelijke omstandigheden (Kurtz & Snowden, 2003), brengt het behouden van vertrouwen in nieuwe praktijken, containment spanningen met zich mee. Containment spanningen duiden op organisatorische krachten die streven naar stabiliteit en controle en weerstand bieden tegen transformationele verandering. Studie 1 onthult faciliterende activiteiten die het weerstaan van dergelijke pull-to-order krachten ondersteunen. Studie 2 herkent drie verschillende sferen van toekomstvorming en suggereert het mogelijk maken van een alsof-reële sfeer als een adaptieve ruimte tussen de irreële en de reële sfeer om de voortgang van oprecht alternatief toekomstgericht handelen te vergemakkelijken. Studie 3 suggereert relationele ondersteuningspraktijken – 'scaffolding' – als een voorwaarde voor cognitieve ondersteuningspraktijken. Relationele 'scaffolding' praktijken helpen emotioneel ongemak verdragen en praktische zorgen rondom vernieuwing te overstijgen als basis voor het bouwen van cognitieve structuren om diversiteit te benutten.

Tenslotte, de sterke aanwezigheid van relationele aspecten en de impact van relationele tekortkomingen in de drie studies wijzen erop dat 'probing futures' – het bevragen van alternatieve toekomst – de toekomst produceert en vormgeeft *te midden van* de dynamische onderlinge verbondenheid van verleden, toekomst en heden in voortdurende interactiepatronen waarin "betekenis, beweging en emoties onlosmakelijk met elkaar verbonden zijn" (Nayak & Chia, 2011, p.297, my

translation). Deze dissertatie over probing futures laat empirisch het belang zien van relationele benaderingen en kritische methoden bij het onderzoeken van complexe maatschappelijke uitdagingen en de rol die organisaties en organiseren daarin hebben (Ergene et al., 2021). De paragraaf over relationaliteit in de algemene discussie van Hoofdstuk 5 betoogt hoe het praktiseren van toekomstverkenning gunstig is voor het ontwikkelen van 'praktische wijsheid' door 'gespreksruimtes' te openen (Durand & Calori, 2006) rond toekomstprobes die dialectiek uitlokken rond 'sameness' en 'otherness'.

Praktische Implicaties

De praktische implicaties van deze dissertatie zijn gericht op organisaties en creatieve bureaus die hen begeleiden bij hun verbeeldingswerk, en educatie. De implicaties voor organisaties zijn breed bruikbaar. Ten eerste legt mijn onderzoek uit hoe future probing verschilt van traditionele benaderingen waarin organisaties met portfolio's verschillende toekomsthorizonnen managen. Future probing gaat over het 'doen' van toekomsten om vandaag anders te handelen in plaats van 'denken' aan en voorbereiden op verre toekomsten die zich al dan niet zullen manifesteren. Het is gebaseerd op het inzicht dat iemands acties direct beïnvloeden hoe de toekomst zich ontplooft en kleine acties kunnen cumuleren tot grote veranderingen. Future probing helpt bewust worden van alternatieve handelingsperspectieven door middel van toekomstprobes en reflecteren op de gevolgen daarvan. Het gaat erom te ontdekken welke emergente interactiepatronen, die voorheen collectief niet gezien werden, de moeite waard zijn om te versterken. Met andere woorden, future probing is gericht op het genereren van emergentie en zelf-organisatie te midden van complexiteit.

Bijvoorbeeld, als men bedenkt dat drones – of meer speculatieve concepten – op termijn in alle haarvaten van ons georganiseerde leven taken vervullen, hoe zou dat leven eruit kunnen zien en wat moet men dan nu doen om dat in dienst van waarden die men belangrijk vindt te laten gebeuren? Het concretiseren van hoe dat eruit zou kunnen zien noem ik 'pull to potentiality'. Dergelijke verbeelding zet druk op huidige systemen ofwel op hoe men gewend is te denken en handelen in het heden. Verbeelding is dan ook uitdagend werk dat vraagt om *containment*, ofwel het generen van condities die een groep samenwerkende actoren bijeenhoudt en spanningen helpt verdragen. Dit is nodig om op te rekken naar echt alternatieve toekomsten en niet te snel te convergeren op één uitkomst, maar diverse mogelijke paden richting de toekomst open te houden.

Ten tweede helpt een probing benadering het gebrek aan verbeeldingskracht te overwinnen door *zijwaartse verbeelding* te stimuleren in plaats van ver weg in tijd. Studenten zijn daarbij een waardevolle aanwinst vanwege hun ongeremde creativiteit. Zij kunnen als buffer fungeren wanneer geïntroduceerde alternatieve toekomstbeelden als provocerend of belachelijk worden gezien. Zijwaartse verbeelding *cultiveert bewustwording* van uiteenlopende signalen van verandering in het heden als trigger voor abductieve verbeelding, die niet eenduidig past bij huidige manieren van doen en denken.

Ten derde geeft mijn onderzoek inzicht in de uitdagingen van het praktiseren van future probing. Zoals elke andere vorm van potentiële verandering roept het verkennen van alternatieve toekomsten organisatorische 'pull-to-order' krachten op die het systeem naar stabiliteit en controle trekken. Aangezien het cognitief uitdagend is om vervreemdende alternatieve probes te verbinden aan dagelijkse toekomstgerichte praktijken, is *empathisch interacteren* belangrijk om verbinding te maken langs relationele lijnen. Zo wordt ruimte gecreëerd voor dialoog en diversiteit rondom het gedoe dat transformatie met zich meebrengt. De cognitieve dissonantie en het gevoel van ongemak dat daarbij opgeroepen wordt door significant verschil tussen het nieuwe en het oude is dan dienend om daadwerkelijk alternatieve mogelijkheden te zien.

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*What the caterpillar calls the end, the rest of
the world calls butterflies*

~ Lao Zi

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About the author

Caroline Maessen (1969) works at HU University of Applied Sciences Utrecht as a researcher in the Co-design Research Group and at the Centre of Expertise Smart Sustainable Cities where she researches how transition processes can benefit from probing alternative futures in transdisciplinary settings. Caroline studied psychology at Utrecht University, the Netherlands, with a specialisation in cognitive ergonomics. She pursued a career marked by innovation, education and the human factor at Utrecht University Department of Psychonomics, Utrecht University Library, and Avans University of Applied Sciences Breda. Caroline started working at HU in 2012 as a liaison and lecturer connecting research, education and practice around various challenges in the creative sector. Since she joined the Co-design Research Group in 2016, she developed her fascination for future thinking, systemic design and qualitative research. Working with students, researchers, creative professionals and domain experts to probe futures of 'health and wellbeing', 'urban areas' and 'inclusive cities' raised her interest in the phenomenon of connecting future imaginations and everyday future-making. In 2019, Caroline started her PhD research at the Institute for Management Research at Radboud University Nijmegen, the Netherlands. Her research focuses on the interplay between imagination and future-making practices, in particular the practice of probing futures to enact alternative courses of action. During her PhD she has obtained a certificate 'Process Research Methods' of Amsterdam Business Research Institute at VU Amsterdam, and attended the summer school 'Advanced Introduction on Practice-Based Studies' held at the University of Warwick. Supported by a KIEM-HBO grant, she developed a toolkit "Futures as Compass" in cooperation with HU Research Group Co-design, Design Innovation Group and Elling & Hoen.

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