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MASTER THESIS

Navigating complexity through design: Tackling the wickedness of sustainability in a business context

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Preface

This article is submitted as the Master Thesis of Freja Regitze Schov, Line Sofie Kastholm Kjergaard, and Sara Røtzler Lind as a part of the Master's programme in Sustainable Design at Aalborg University, Copenhagen. This preface introduces the article *Navigating complexity through design: Tackling the wickedness of sustainability in a business context* and its relevance in the field of Sustainable Design Engineering.

Business Strategy and The Environment

The article is intended for publication in the academic journal Business Strategy and The Environment published by Wiley. The table below outlines how the article in its current form as a Master Thesis would perform according to the journal's requirements.

	Requirements in Business Strategy and The Environment	**Navigating complexity through design: Tackling the wickedness of sustainability in a business context**
Words	Maximum of 8.000 words (excluding references)	8.525 words
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As a leading sustainability business journal, Business Strategy and The Environment aims to advance the understanding of green business strategies and has a broad intended audience of academics, practitioners, business managers, and consultants. This article offers useful terminology, suggestions, and a playbook through which to understand the complexity of sustainability as a wicked problem in a business context and what this entails for sustainability projects. Framing sustainability strategy as collective, emergent processes of wayfinding, the article presents consultants as facilitators of such processes. It further outlines how the design framework Staging Negotiation Spaces offers an actionable approach to through which such facilitation work can unfold to build sustainability strategic value. Consequently, Business Strategy and The Environment is a highly relevant platform for communicating the insights of this article to people working with sustainability in different disciplines and positions.

Preface

Navigating the complexity of sustainability

The idea for this Master Thesis emanated from Donna Haraway's book Staying With The Trouble from 2016. Her literary acknowledgement of the complicated messiness of performing sustainability work and the call to continuously stay in it, led us to question what this means for sustainable design engineers. It inspired us to examine what this trouble 'is', and how we – as sustainable design engineers – are supposed to 'stay with it'.

Sustainable design engineers' raison d'être is to support the sustainability transition – a recognition that many environmental problems comprise many grand societal challenges and calls for a radical shift towards new kinds of socio-technical systems (Köhler et al., 2019). We will become 'sustainability practitioners' working in various business contexts, sectors, and industries to 'operationalise' sustainability. We will undertake the work of translating general sustainability aims, guidelines, and principles into local, situated initiatives embracing the specific context. This translation work is neither pre-given nor static in its definition; in the field of sustainability, we are continuously learning, building insights, and expanding our collective vocabulary through scholarly research and practical experimentation. This enables us to better grasp and tackle complex sustainability issues and to create positive impact for sustainability.

This translation work is a difficult task set in a context of urgency due to immense pressures on Earth's systems and the climate and biodiversity crisis (Rockström et al., 2015; Richardson et al., 2023). Navigating the complexity of sustainability is akin to walking a fine line between acknowledging the extent and seriousness of the troubles while not succumbing to their overwhelming nature. It is to neither be tempted towards abstract imaginations of perfect and harmonious futures nor to give in to indifference and despair (Haraway, 2016; Rittel & Webber, 1973).

Haraway (2016) instead encourages us to collectively (re)learn how to be truly present and engage with this 'trouble'. To do so, we turned to the concept of wicked problems (Rittel & Webber, 1973) as it highlights the indeterminacy of sustainability work. Furthermore, we saw the potential in design, and, in particular, the potential of framing sustainability work as processes of staging negotiation spaces (Pedersen, 2020). This offers an actionable framing of how to facilitate such negotiations to strengthen the 'response-ability' (Haraway, 2016) of sustainability practitioners.

We must stay moderately optimistic (Rittel, 1972) and create collective, experimental processes (Rittel & Webber, 1973; Pedersen, 2020). We must stay with the trouble – with the myriads of unfinished and ever-changing configurations of places, times, matters, and meanings (Haraway, 2016).

Acknowledgements

We would like to express our profound gratitude to our supervisor, Signe Pedersen. Thank you for supporting us in staying with the trouble throughout this Master Thesis and providing essential guidance and feedback throughout the process.

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"Our task is to make trouble, to stir up potent response to devastating events, as well as to settle troubled waters and rebuild quiet places."

– Donna Haraway

MASTER THESIS

Navigating complexity through design: Tackling the wickedness of sustainability in a business context

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ABSTRACT

Sustainability challenges are characterised by immense complexity, rendering traditional problem-solving approaches and business processes ineffective in their resolution. This article investigates how the inherent complexity of sustainability can be framed as a wicked problem. By integrating this concept in a design-led case study and drawing on the rationalities of Actor-Network Theory, Participatory Design, and the Staging Negotiation Spaces Framework, the article shows not only that this framing supports navigating in the complexity of sustainability but also how design can empower sustainability consultants in facilitating the navigation of complexity while creating sustainability impact.

Through a continuous conversation between academic literature and the practices of sustainability consultants, this article offers useful terminology, suggestions, and a playbook that can assist sustainability practitioners in recognising the inherent complexity of sustainability and what this means for sustainability projects. Consequently, this article contributes to ongoing discussion on how sustainability practitioners should tackle the complexity of sustainability.

KEYWORDS

sustainability, design, wicked problems, sustainability consultants, sustainability strategy, staging negotiation spaces

1 | INTRODUCTION

Our current way of living and doing business has put monumental pressure on Earth's natural systems. With resource-intensive activities and practices driven by old rationalities of economic growth, a growing consensus among scholars underlines that businesses play a crucial role in addressing sustainability challenges (Neugebauer et al., 2015, Busch, 2023; Adelson et al., 2023). Sustainability is characterised by its immense complexity arising from intricate interconnections at the boundary of natural and social systems. It transcends political and national boundaries and involves a multiplicity of stakeholder interests, goals, and values (Crowley & Head, 2017). As sustainability challenges are further compounded by intergenerational considerations and indeterminable time horizons (Ibid.), efforts towards sustainability become increasingly difficult to manage on both local and global scales (Rockström et al., 2015; Richardson et al., 2023). Positioned at the intersection of these systems, businesses have the potential to positively impact sustainability challenges (Waddock et al., 2015). However, the immense complexity of these challenges renders traditional problem-solving approaches and business processes ineffective in their resolution (van Tulder, 2018).

It is widely agreed that the concept of *wicked problems* (WPs), attributed to Rittel and Webber (1973), is useful for describing the inherent complexity of sustainability (Neugebauer et al., 2015; Luederitz et al., 2021; Preuss et al., 2023). Wicked problems are characterised by their ill-defined nature. There is no one correct way of approaching them, and therefore, they do not have one correct solution. Their resolution instead calls for new perspectives on problem-solving and strategy work that consider their immense complexity and dynamic nature.

To effectively address sustainability as a WP, strategy and process scholars argue that viable strategies cannot merely be planned but emerge through *wayfinding* (Bouty et al., 2019). This process must be supported by strategy tools, but existing strategy tools fail to capture the dynamics of WPs, in turn leading to incomplete or ill-suited solutions (Tulder, 2018; Wright et al., 2019; Burke & Wolf, 2021). Furthermore, as the expertise to tackle WPs is distributed across many different people, disciplines, and forms of expertise (Rittel, 1972), sustainability strategic work calls for transdisciplinary and collaborative processes as well as *decision-making experts* (Mieg, 2006) or facilitators (Kpamma et al., 2017) responsible managing this process.

The facilitation of collective, argumentative processes is a key element within the field of participatory design (Simonsen & Robertson, 2013). With design's flexibility, experimental approach, and focus on what 'ought to be' (Buchanan, 1992), it is well-suited for tackling the uncertainties inherent in sustainability challenges and fostering collaborative problem-solving processes (Hocking et al., 2016; Pedersen et al., 2023). Applying key insights from participatory design to the field of sustainable business work, this article views sustainability consultants as situated actors - and as designers - taking on the role of navigating the complexity of sustainability and facilitating the intricate processes of problem-tackling (Pedersen et al., 2023).

The aim of this article is to utilise a collaborative design approach (Clausen et al., 2020) to strengthen the way sustainability consultants navigate the complexity of sustainability. At its core, it has a case study with six sustainability consultants – both in-house and external – based in Denmark as examples of sustainability practitioners. The case is built upon insights gathered from continuous meetings and negotiations between academic literature and the practical experiences of sustainability consultants. This article pursues two objectives: 1) to identify how the concept of wicked problems can describe the complexity of sustainability, and 2) to articulate how design can empower sustainability consultants to facilitate the navigation of the complexity of sustainability.

2 | LITERATURE REVIEW

2.1 Sustainability as a wicked problem in a business context

Sustainability is characterised by its immense complexity in dealing with the interactions between the natural and social systems. The challenges that arise at the boundary of these systems, such as climate change, biodiversity loss, and social inequity, are interconnected and span time and space (Crowley & Head, 2017). This complexity presents challenges in coordinating and managing efforts toward sustainability on local and global scales (Rockström et al., 2015; Richardson et al., 2023). There is a consensus among scholars that businesses can play a crucial role in addressing these challenges (Neugebauer et al., 2015, Busch, 2023; Adelson et al., 2023). However, in rapidly changing business environments these challenges cannot be effectively addressed with traditional problem-solving approaches and business processes (van Tulder, 2018). Waddock et al. (2015) emphasise this complexity by describing organisations as "not contained by their institutional or even industrial boundaries, but rather (…) an integral part of an increasingly interconnected dynamic system of actors and institutions that together support positive or negative change in the short and long term." (p. 994). In this context, the notion of wicked problems (WPs), first formulated by Rittel and Webber (1973), provides a useful foundation for describing, understanding, and navigating the complexity of sustainability in today's business landscape (Neugebauer et al., 2015; Luederitz et al., 2021; Preuss, et al., 2023; Adelson et al., 2023).

2.1.1 Business sustainability

Traditionally, businesses have approached sustainability through the triple bottom line, meaning that they evaluate business performance along economic, environmental, and social dimensions of sustainability (Brønn & Brønn, 2018). Nevertheless, Brønn and Brønn (2018) argue that due to a focus on hypergrowth and short-term earnings, the managerial focus is often skewed towards economic sustainability. Marchau et al. (2019) further emphasise that "substituting assumptions for deep uncertainties might simplify choices in the short term but may come at a

much higher price in the longer term." (p. 4). Similarly, Canal Vieira et al. (2024) underline that this 'short-termism' is often associated with inadequate sustainability outcomes. Sustainability-focused ventures for businesses thus become a task of balancing and achieving economic viability while creating (opportunities for) sustainable impact (Coffay et al., 2022). Additionally, Brønn and Brønn (2018) underscore this perspective further by positing that the central question becomes strategic – "'What shall we do?' rather than actionable 'How shall we do it?'" (Brønn & Brønn, 2018, p. 1).

2.1.2 Sustainability and the concept of wicked problems

The concept of WPs was coined by Rittel and Webber (1973) as part of their work on urban planning and social policy science. They argued that WPs have an entirely different set of characteristics than problems traditionally found in the natural sciences, hereunder, they lack clear causal relationships, why they cannot be 'objectively' defined. This renders classical scientific and reductionist approaches ineffective in their resolution. Moreover, Rittel and Webber's argue that since WPs cannot be objectively defined, there exists neither a 'proper' entry point nor a 'correct' solution. Rather "they rely upon elusive political judgment for resolution" (Rittel & Webber, 1973, p. 160) and are at best only "re-solved over and over" (Ibid.).

Rittel and Webber's (1973) notion of WPs has been widely accepted within academia (Crowley & Head, 2017) and the concept has been utilised, operationalised, and further developed by various scholars since its conceptualisation in 1973 (Weber & Khademedian, 2008; Levin et al., 2012; Termeer & Dewulf, 2019; van Tulder, 2018). Expanding on the concept of WPs, Levin et al. (2012) coined the term *Super Wicked Problems* to underscore the heightened complexity and urgency of environmental challenges. As time is running out, the wickedness of these problems increases: "the problem will, at some point, be too acute, have had too much impact, or be too late to stop or reverse." (Levin et al., 2012, p. 127). Levin et al. (2012) argue how *progressive incremental work* is the proper response to the overwhelming complexity and urgency of Super WPs. Relatedly, Termeer and Dewulf (2019) introduced the *small wins framework* as a practical approach to WPs. To overcome the potential of paralysis (discouragement and inaction) and simplification (the belief that WPs can be solved), they argue that we must focus on achieving incremental progress and small, manageable actions. Along the same lines, Weber and Khademian (2008) have operationalised the concept of WPs to explore how long-term, collective problem-solving capacity can be built among stakeholders. They argue that by identifying and engaging stakeholders, establishing common goals and trust, facilitating knowledge sharing, this collaborative problem-solving capacity can be developed. This focus becomes particularly valuable in the face of the multiplicity of stakeholder interests, needs, perspectives, etc., inherent in the complexity of sustainability.

Recognising problems as 'wicked' is crucial for addressing them effectively. Consequently, Rittel and Webber (1973) identified ten criteria that characterise WPs. All ten criteria are clearly satisfied by the concept of sustainability (Table 1, p. 4).

2.2 Strategy work, Sustainability, and wicked problems

Research on processual strategy work and strategy as practice recognise key rationalities relevant to the intersection of businesses, sustainability, and WPs. Jarzabkowski and Kaplan (2015) underline that strategy is not something businesses have but something people do. Thus, strategy can be understood as an organisation's long-term direction consisting of both planned and emergent elements (Neugebauer et al., 2015; Luederitz et al., 2021). Burke and Wolf (2021) stress how organisational responses to ambiguities, issues, and tensions of WPs often unintentionally create a stream of practical coping actions that accumulate strategic value. Therefore, viable strategies for addressing WPs cannot merely be planned but emerge through wayfinding (Bouty et al., 2019), described as coherent patterns in a stream of decision-making (Ibid., Neugebauer et al., 2015; Luederitz et al., 2021). Accordingly, it is relevant to include perspectives and knowledge of different actors in transdisciplinary decision-making processes, including both local information and contextual insights as well as actors representing more formal and general knowledge (Mieg, 2006). Furthermore, transdisciplinary and collaborative processes call for decision-making experts (Ibid.) or facilitators (Kpamma et al., 2017) to be responsible for designing and managing the process towards synthesis(es).

2.2.1 Strategy tools

Strategy work is people-things interactions (Jarzabkowski & Kaplan, 2015; Burke & Wolf, 2021) with the integrative presence of both *purposive* (conscious, but non-deliberate) and *purposeful* (conscious and deliberative) actions (Bouty et al., 2019; Burke & Wolf, 2021). Jarzabkowski and Kaplan (2015) stress in

Table 1: Wicked problem criteria (Rittel & Webber, 1973) and their relationship to sustainability synthesis inspired by Brønn and Brønn (2018).

Wicked Problem Criteria	Sustainability Linkage
1) There is no definitive formulation of a wicked problem.	Sustainability lacks a clear definition as it encompasses various dimensions such as environmental, social, and economic aspects. Consequently, the definition and interpretation of issues within sustainability are subjective shaped by multiple stakeholders' interests, perspectives, and values (Neugebauer et al., 2015; Brønn & Brønn, 2018; Preuss et al., 2023).
2) Wicked problems have no stopping rule.	Given the dynamic context with many interacting systems, there is no clear point at which efforts towards sustainability can be said to be complete. As new challenges arise, further adaptation and progress can always be made (Brønn & Brønn, 2018; Preuss et al., 2023).
3) Solutions to wicked problems are not true-or-false, but good-or-bad.	Solutions to sustainability issues are often judged based on their effectiveness (working towards a less unsustainable state) rather than being definitively correct as different stakeholders may have different opinions on what a good solution looks like (Brønn & Brønn, 2018; Pederneiras et al., 2021; Preuss et al., 2023).
4) There is no immediate and no ultimate test of a solution to a wicked problem.	Tackling sustainability problems requires focusing on the process as the impact of initiatives are often long-term and takes time to manifest, making it difficult to measure the impact of any given solution. Furthermore, as changes for sustainability are made to dynamic systems, and not introduced in controlled environments, solutions are also difficult measure because they interact with a multitude of other environmental, social, and economic factors not all of which can be identified, controlled, and managed (Neugebauer et al., 2015; Brønn & Brønn, 2018).
5) Every solution to a wicked problem is a 'one-shot operation'; because there is no opportunity to learn by trial-and-error, every attempt counts significantly.	Implementing solutions to sustainability issues can have unforeseen and irreversible consequences given the highly complex nature of the dynamic systems involved (Brønn & Brønn, 2018).
6) Wicked problems do not have an enumerable (or exhaustively desirable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan.	Given the complex interactions of social, ecological, and economic systems, there is not a comprehensive way of working towards sustainability – thus there are enumerable potential solutions (Brønn & Brønn, 2018; Preuss et al., 2023).
7) Every wicked problem is essentially unique.	As sustainability issues are highly localised and embedded in their societal and natural context, a one-size-fits-all solution cannot be applied. Solutions towards sustainability must be tailored to fit context needs (Brønn & Brønn, 2018).
8) Every wicked problem can be considered to be a symptom of another problem.	Sustainability issues are consequences of nested and dynamic systems. They often stem from or contribute to other problems (Brønn & Brønn, 2018).
9) The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution.	The way that sustainability issues are framed and defined determines the strategies and solutions being proposed (Brønn & Brønn, 2018).
10) The planner has no right to be wrong.	Having to navigate sustainability issues in a world of uncertainty and incomplete knowledge is difficult, but mistakes can have major social and environmental consequences (Brønn & Brønn, 2018; Pederneiras et al., 2021).

people-things interactions, strategy tools shape how actors frame problems and can even enable actors to advance their interests in those problems.

Even though the making and use of tools are important vehicles to stimulate emergent strategic action, existing strategy tools and decision-making methods are falling short in the context of tackling WPs (van Tulder, 2018; Wright et al., 2019; Burke & Wolf, 2021). Conventional strategy tools might even exacerbate WPs by encouraging ill-suited solutions, especially, if the rationality instantiated in tools leads managers to oversimplify WPs and gloss over latent issues (Termeer & Dewulf, 2019; Burke & Wolf, 2021). As Marchau et al. (2019) point out, decisions that ignore deep uncertainty ignore reality. Burke and Wolf (2021) further stress that tackling part of a WP in isolation will lead to incompleteness, and Wright et al. (2019) even claim that, attempting to tame only part of a WP as opposed to the whole, is morally wrong.

2.2.2 Rationalities when strategising for wicked problems

Strategy tools are often designed by academics and consultants to support problem navigation through theoretical formulations (Burke & Wolf, 2021). To support WP navigation consultants must acknowledge how strategy tools neither provide complete answers to specific problems (Jarzabkowski & Kaplan, 2015) nor perfect map-based navigation and the possibility of 'knowing before we go' (Chia & Holt, 2009). Strategy tools do not cause actors to make right or wrong decisions. Rather, they enable actors to engage in strategy making; they support the creation of a common language and offer spaces for the negotiation of interests (Jarzabkowski & Kaplan, 2015). This can be seen as an argumentative approach. In the context of sustainability, these processes of strategy tool-making must create such spaces for 'experiencing' the indeterminacy and complexity of WPs and the holistic nature of sustainability (van der Marel & Björklund, 2022). Further, strategic value is accumulated by allowing 'cycles of spin-offs', where actors discuss and strategise multifarious issues and changes (Burke & Wolf, 2021).

Businesses that learn to adapt this argumentative approach to strategy-making and innovate in the face of WPs and changing business environments will be better positioned for long-term success. van Tulder (2018) stresses that it must be a collective effort that enables collaborative advantages for all. While thinking in terms of solutions instead of problems is both tempting and preferred by many management scholars and consultants (Ibid.), a collective and collaborative transforming approach must set the tone for how consultants (and other sustainability practitioners) should work in light to the complexity of sustainability. Strategy-making should be less about navigating this complexity with pre-existing tools and more about stepping "into the unknown and developing an incomplete but practically sufficient comprehension of the situation in order to cope effectively with it." (Chia & Holt, 2009, p. 159).

2.3 Navigating and tackling complexity through design

We propose that design is central to 1) ensuring a collective, experimental, and argumentative approach to navigating and tackling the complexity of sustainability, and 2) examining how to equip consultants to the facilitation of such socio-technical, relational, and processual strategy work. In taking this approach, we draw inspiration from and contribute to a line of research that has emphasised the symbiotic relationship between the concept of WPs and design (Buchanan, 1992; Rith & Dubberly, 2006; Hocking et al., 2016; Veltman et al., 2019).

2.3.1 Flexibility of design

Importantly, design represents flexibility as it can concern itself with several layers of abstraction and subject matter with its direction toward dynamic and diverse human values and contemporary needs (Buchanan, 1992). While natural science concerns regularities and general laws, design is engaged with the 'particular', that that which cannot be made into universal principles and formulas (Ibid.).

2.3.2 Potentials when tackling wicked problems

Engaging with the potential of design reveals its relevance for WPs. First and foremost, design is concerned not with what is (as with science) but with what ought to be (Buchanan, 1992; Rith & Dubberly, 2006). Design represents an integrative approach to investigating, communicating, and (re)acting, focused on adapting valuable knowledge from libraries and laboratories towards human life's current problems and purposes (Buchanan, 1992). It is able to do so because it is characterised by experimental processes. Due to the high levels of uncertainty characteristic of WPs, design's experimental and dynamic approach with empathic and prototypical feedback cycles (Earle & Leyva-de la Hiz, 2020) counteracts the urge to impose a premature order on the problem at hand (Schweizer et al., n.d.). Moreover, the complex nature of WPs creates a need to engage collective wisdom from multiple disciplines (Bailey et al., 2018;

Rittel, 1972), calling for transdisciplinary processes (Brown et al., 2010) and argumentative design processes (Rith & Dubberly, 2006). In such transdisciplinary processes, designers can be seen as 'brokers' (Veltman et al., 2019) bridging different forms of knowledge by translating, negotiating, and coordinating work (Ibid.; Pedersen, 2020).

2.3.3 Design as a political process

As highlighted in the WPs literature, all design work is political (Rith & Dubberly, 2006). This political awareness along with the collective and transdisciplinary aspects of design processes, is deeply embedded in the field of Participatory Design (Simonsen & Robertson, 2013). Here, democracy and change are core values (Pedersen, 2020), and participation is focused not only on end-users, but also on various actors related to the subject. Participatory Design found relevance in Actor-Network Theory as it sensitised the political and social aspects of design (Storni, 2015). Collaboration and democracy have been and continue to be a central concern within design. Especially Actor-Network Theory presents a processual and relational understanding of how continuous processes of argumentation and controversy shape the configurations of relational networks (Latour, 2005). At the intersection of WPs and collaborative design, then, design must be seen as an action of configuring systems of relationships rather than just artefacts (Hocking et al., 2016).

2.3.4 Design and sustainability

Sustainability is a highly situated phenomenon, presenting no standard design, generalisable solutions (Pedersen et al., 2023). Therefore, design's attention to the particular is relevant. In sustainability transition efforts actors such as internal managers, researchers, and designers, as well as external actors such as universities, governmental bodies, and consultancies (Klewitz et al., 2012) can all be seen as situated actors having to take on the role of navigating the complexity of sustainability and facilitating fruitful processes of problem-tackling (Pedersen & Brodersen, 2020). Especially in the professional settings of design work, a high sensitivity to situatedness is relevant as the ideas and actions of professional sustainability practitioners are situated within robust networks of other stakeholders, business models, strategies etc. (Pedersen, 2020).

In this article, we approached design as integrative, socio-technical, and argumentative processes of network configuration. Subsequently, we examined the fruitfulness of perceiving professional sustainability consultants as designers – co-imaginers of what ought to be and facilitators of the intricate design work that follows – in light of the indeterminancy and complexity of a WP like sustainability.

3 | METHODOLOGICAL AND THEORETICAL FRAMEWORK

The approach of this paper has been research through design (Archer, 1979). To perform design-led research, we have drawn upon the co-design framework known as Staging Negotiation Spaces (SNS), which provides terminology to analyse the non-linear, collective, and argumentative aspects of design (Pedersen, 2020). The framework offers both an analytical frame and actionable moves complimenting such design-led research (Pedersen, 2020; Pedersen et al., 2022). It builds upon the Participatory tradition, Design Thinking, and Engineering Design and focuses on how designers should navigate complex settings such as sustainability challenges (Pedersen et al., 2023) through the staging and facilitation of negotiations (Pedersen, 2020).

Underlying rationalities of Actor-Network Theory provide the SNS framework with an analytical perspective that allows designers and researchers to create multifaceted descriptions of complex socio-technical settings (Pedersen, 2020). Processes and relations shape the world, while networks do not exist 'out there' but rather stand as conceptual tools to create descriptions of the world (Storni, 2015). By employing the notions of *inscriptions*, *translations* and *matters of concern* (Latour, 2005), we are sensitised towards the continuous constructions of interpretations and interactions, emphasising design work's political and argumentative aspects (Pedersen, 2020).

The SNS framework is centred on the continuous negotiations taking place throughout a design process and aims to illuminate the strategic moves taking place before, during, and after said negotiations. SNS differentiates between the *frontstage* work (e.g., workshops) and the *backstage* work (e.g., preparation), thereby stressing an analytic focus on the political and strategic work shaping the set-up and outcomes of design processes (Bødker et al., 2017; Pedersen & Brodersen, 2020). Furthermore, the framework presents the role of *the stager of negotiations* in collaborative processes. The term *negotiation space* refers to the framing and/or figurative boundaries for which concerns are to be negotiated and under what set of circumstances. The *staging work* refers to the

preceding planning and construction of these framings, while *re-framings* are the necessary response to the collective negotiations of said framing(s) (Figure 1) (Pedersen, 2020).

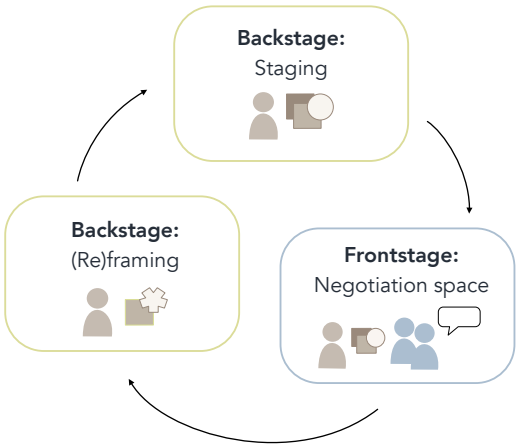

Figure 1: Visualisation of the SNS Framework

Within SNS (and in design in general) *objects* play a central role throughout the design processes as they hold the potential to foster negotiations and knowledge building. An object can be seen as an *intermediary object* (Vinck, 2012) by fulfilling three elements *representing*, *mediating*, and *translating* actors, positions, concerns as well as ideas and processes (Pedersen, 2020; Pedersen & Brodersen, 2020).

3.1 A case study

This research can be seen as staging a continuous negotiation between academic literature and empirical knowledge, between the theoretical and the practical. At the core of this paper is a case study of how academic insights relate to the work of sustainability consultants in a Danish context and how these academic insights can be conceptualised to support the consultants' roles as possible facilitators in tackling the complexity of sustainability. Overall, the case study included collaborative engagement with six sustainability consultants, all working on implementing sustainability initiatives (Table 2). The case study included both external and in-house sustainability consultants to assess whether and how the translation of the literary insights resonated with different types of consultancy work. Two consultants were in-house sustainability consultants in large organisations, and four were external consultants from sustainability consultancies supporting organisations and businesses in their sustainability initiatives. The consultants' strategic focus in sustainability initiatives were on organisational level or project level – or both. The number of participations varied throughout the negotiation process according to the staging work. The negotiations were performed in continuous movements between front- and backstage. Frontstage, negotiation spaces were performed as 'interactive' interviews and workshops, wherein different materialities were used to represent relevant theoretical concepts.

Table 2: List of sustainability consultants engaged in the case study, including consultant type, strategic level and number of interactions.

Sustainability Consultant	Consultant Type	Strategic Level	Company	No. of Frontstage Participations
Consultant 1	In-house	Organisational and project level	Large mobility company A	3
Consultant 2	In-house	Project level	Large mobility company B	2
Consultant 3	External	Project level	Sustainability consultancy A	4
Consultant 4	External	Organisational level	Sustainability consultancy A	4
Consultant 5	External	Project level	Sustainability consultancy B	3
Consultant 6	External	Project level	Technical consultancy C	2

The structure of both interviews and workshops was staged through the interaction with certain materialities, such as game boards and visualisations, opening for a more unstructured conversation and for 'rolling the snowball' for further matters of concern to consider in the design work. *Design games* such as ranking activities (Pedersen & Brodersen, 2020) proved valuable in facilitating mutual learning and negotiating concerns.

In the backstage framing and re-framing work, *affinity diagrams* (Pedersen & Brodersen, 2020; Holtzblatt et al., 2015) were utilised to create overviews of how the literary and empirical insights corresponded and related to each other. The affinity diagram was a strong tool for coding insights and identifying patterns within and across academic literature and empirical insights, especially in detecting and mapping relations, controversies, and prevalent concerns. Drawing from design traditions, we utilised *scenarios* to create a space for dialogue between possible design directions based on insights from existing challenges (Bødker, 2000). From the Engineering Design tradition (Cross, 2008), we made use of *design specification* and *morphology schemes* to structure a systematic organisation of collective insights.

By following the negotiations, we were able to identify relevant alignments and controversies. The dynamic characteristics of the tools complimented the iterative and exploratory approach as well as the continuous movements between front- and backstage to bridge the theoretical with the practical.

4 | RESULTS

This section will present the negotiation process with the sustainability consultants presented in Section 3.1. This negotiation work was performed through continuous staging, negotiation spaces, and re-framing work (Figure 2).

The first negotiation unfolded insights on how to frame sustainability as a WP and resulted in mapping existing tools and barriers for tackling the complexity of sustainability. The second main negotiation examined how to empower sustainability consultants in navigating the complexity of sustainability, which led to the collaborative design of a playbook for sustainability consultants.

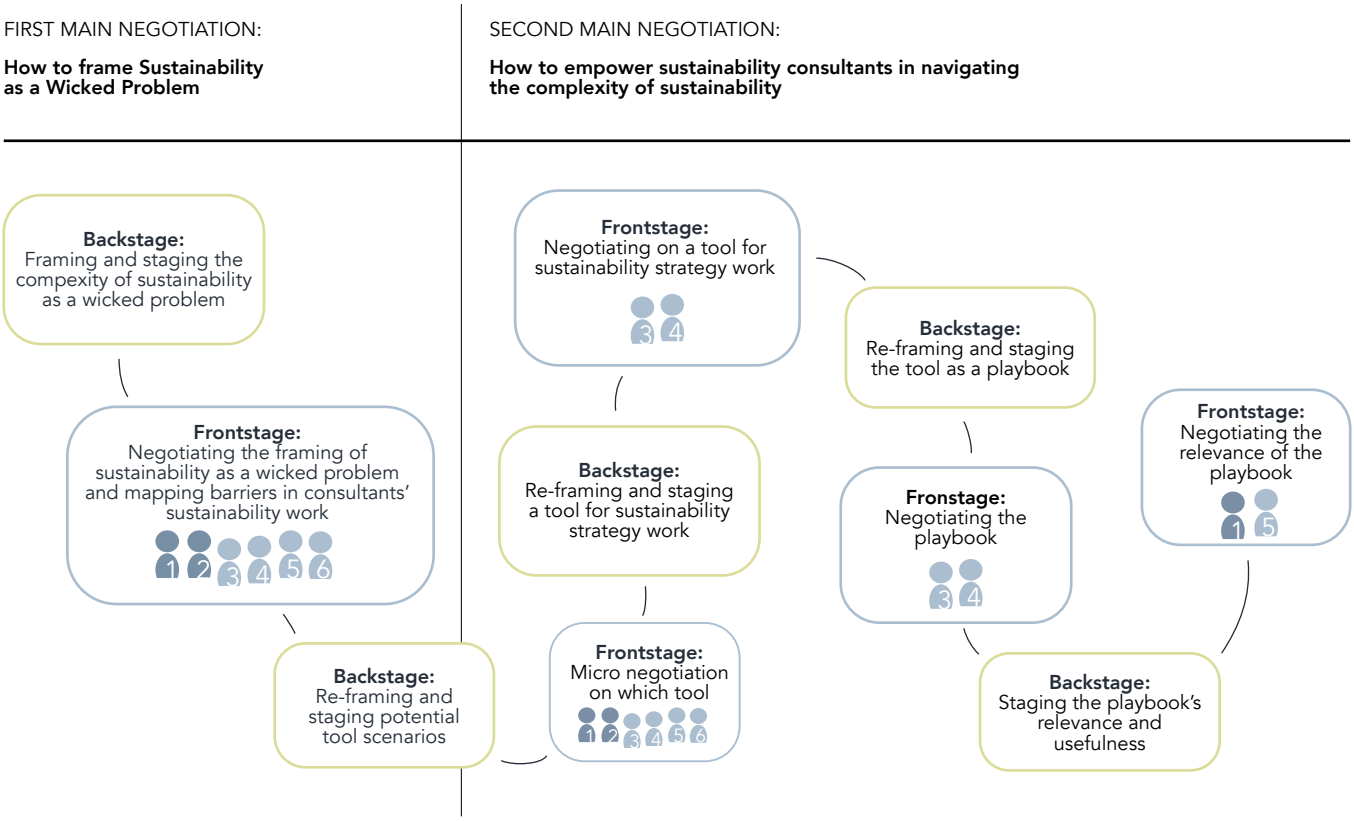

Figure 2: Visualisation of the several iterations of staging, negotiation spaces, and re-framings during the case study.

FIRST MAIN NEGOTIATION: Sustainability work framed as a wicked problem

4.1 Framing sustainability as a wicked problem

The insights from the literature review on the concept of WPs and its relations to sustainability, business, and design were coded and organised in an affinity diagram revealing two main thematic clusters: 1) characteristics of WPs, and 2) how to tackle WPs – each consisting of numerous subclusters (Appendix A).

To organise large amounts of data, we condensed and translated insights identified in thematic cluster one into four main aspects of sustainability framed as a WP, termed *Complexity Dimensions of Sustainability* (CDSs) (Table 3, p. 10), and insights in thematic cluster two were organised into five aspects of working with and navigating sustainability as a WP, termed *Navigation Approaches of Sustainability* (NASs) (Table 4, p. 10).

4.2 Staging a negotiation on sustainability as a wicked problem

The aim of the negotiation was twofold. First, we wanted to test WPs as a frame for describing the complexity of sustainability and prescribing ideal approaches in sustainability work. Second, we set out to examine which existing tools were supporting this work and which barriers were challenging it in the context of the sustainability consultants.

To investigate possible differences between the in-house and external consultants, all six sustainability consultants were invited to partake in individual interviews and design games were created to support the facilitation and represent the framing. The objects were prepared on paper to communicate the intention of a non-fixed and open dialogue. The objects were shaped as follows: A game board representing the first aim of the negotiation; individual game pieces representing the CDSs and NASs (Figure 3).

To examine supporting tools and existing barriers, an additional game board were inscribed with the two spaces consultants work within: an internal space with colleagues, leaders, and corporate strategies, and an external space with customers, external collaborators, and stakeholders outside the consultant's organisation. The mentioned tools were captured on Post-it-notes to reflect immediate insights back to both us and the interviewees.

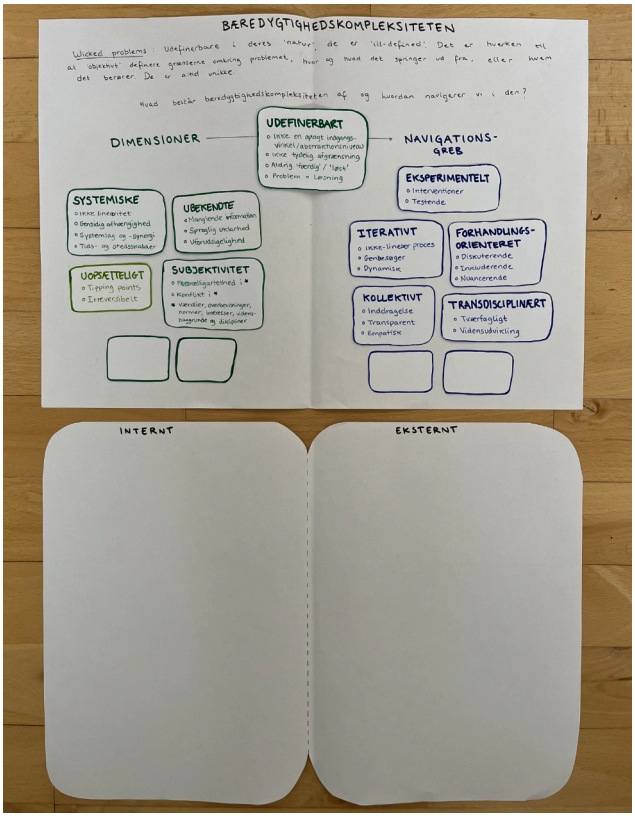

Figure 3: Game pieces representing the CDSs and NASs.

4.3 Negotiating the framing of sustainability as a wicked problem and barriers in consultants' sustainability work

The negotiation spaces unfolded in the consultants' respective office spaces, while a single negotiation was held online due to the consultant working abroad (where all objects were transformed into digital elements in a shared 'dashboard' on the digital collaboration platform Miro).

4.3.1 A helpful framing for describing and prescribing sustainability work

All of the consultants expressed appreciation of the framing and saw coherence with their understanding of sustainability. The negotiations showed a strong alignment between the translation of the WP literature into CDSs and NASs and the consultants' experiences. For example, In-house Consultant 1 described it as one of the best descriptions of sustainability and WPs they had seen, and External Consultant 4 underlined how the translation "resonates in many levels and forms".

4.3.2 From Subjectivity to Heterogeneity

We also found that parts of the inscription did not always translate seamlessly. This was mainly caused by the wording on the game pieces. However, the inter-

Table 3: Four identified dimensions of sustainability framed as a wicked problem.

Complexity Dimension of Sustainability (CDSs)	Description
Heterogeniety	There exist a great and often conflicting diversity in our values, norms, interest, knowledge, background, and ambitions. This diversity will always influence sustainability work (Rittel & Webber, 1973; Nie, 2003; Rith & Dubberly, 2006; Weber & Khademedian, 2008; Termeer & Dewulf, 2019; Brønn & Brønn, 2018; Adelson et. al, 2023).
Systemic	The world is built up of non-linear systems consisting of various mutual dependencies. In sustainability work, these relations exist both at different layers and operate across time and space (Rittel & Webber, 1973; Nie 2003; Levin et al., 2012; Termeer & Dewulf, 2019; Brønn & Brønn, 2018; Earle & Leyva-de la Hiz, 2020).
Uncertainty	There are many factors that cannot be predetermined, hence, remaining unknown. Even with all our present-day knowledge about sustainability, great uncertainty and ambiguity persists (Rittel & Webber, 1973; Crowley & Head, 2017; Coffay et al., 2022; Adelson et. al 2023; Schweizer et al., n.d.).
Urgency	Sustainability efforts are characterised by a fundamental urgency. Irreversible damage and tipping points strongly indicate that immediate action is needed, and status quo no is no longer viable (Nie, 2003; Levin et al., 2012, Waddock et al., 2015; van Tulder, 2018, Marchau et al., 2019; Adelson et al., 2023).

Table 4: Five identified navigation approaches to navigate the complexity of sustainability.

Navigation Approaches of Sustainability (NASs)	Description
Iterative	We must work iteratively with cyclical revisits to ensure that important insights adjust and strengthen both processes and solutions in sustainability work (Termeer & Dewulf, 2019; Earle & Leyva-de la Hiz, 2020; Schweizer et al., n.d.)
Experimental	We continuously need to test new ideas and techniques and through feedback identify well-adapted solutions for the specific sustainability context (Rittel & Webber, 1973; Termeer & Dewulf, 2019; Coffay et al., 2022; Schweizer et al., n.d.)
Collective	We need to actively engage actors and emphatically unite resources and ideas to create a cohesive effort for sustainability (Rith & Dubberly, 2006; Weber & Khademedian, 2008; Hocking et al., 2016; van Tulder, 2018; Bailey et al., 2018).
Transdisciplinary	We must integrate knowledge and methods from various disciplines to co-create new understandings and solutions for sustainability. (Buchanan, 1992; Weber & Khademedian, 2008; Hocking et al., 2016; van Tulder, 2018; Veltman et al., 2019).
Argumentative	We must develop mutual understandings for sustainability through transparent, inclusive, deliberate, argumentative and nuanced dialogue (Buchanan, 1992; Rith & Dubberly, 2006; Crowley & Head, 2017; Pederneiras et al., 2021).

viewer corrected and elaborated during the negotiation to regain alignment. Detecting misalignments was valuable in terms of refining the wording of each description as well as the title of the CDSs and NASs on game pieces, ensuring stronger representation and, therefore, translation. First of all, the descriptions were transformed from keywords to full sentences to lessen the chances of misunderstandings. Another example of alterations was changing the CDS Subjectivity into Heterogeneity. As Subjectivity was mostly understood by the consultants as conflicting personal opinions, it was necessary to alter it to elucidate how variation is the norm and that varying concerns also arise from different disciplinary backgrounds, societal positions, values, etc.

4.3.3 Ranking as a conversation starter

A ranking of the CDSs and NASs was planned to support the discussion on when, where, and why the complexity of sustainability becomes difficult to handle and the NASs difficult to perform. This encouraged the consultants to consider all the CDSs and NASs during the interview consciously. The ranking presented Heterogeneity as the most difficult CDS and Transdisciplinarity as the most difficult NAS. The ranking of the NASs resonated with the consultants' existing work practices and mostly led to discussions of how projects were carried out. The ranking of CDSs fostered discussions of how objects supported the communication and tackling of these dimensions.

4.3.4 Existing objects support the Systemic CDS

Questioning the support from existing tools enabled a more practice-near and contextual connection to more abstract CDSs. The consultants emphasised the effectiveness of utilising objects in their work, and we witnessed a general correlation between the number of objects and how difficult the consultants ranked the dimensions. This was especially clear in the case of the Systemic CDS, that had the most objects to support navigation, e.g., Value Chains, and was concurrently ranked the least difficult dimension to tackle.

4.3.5 Similar emphasised barriers

The interviewees, both in-house and external consultants, emphasised many similar barriers revolving around three themes: 1) the organisational frame e.g., resource constraints, 2) project work arrangements, e.g., rigid project definitions and insufficient project 'afterlife', and 3) different sustainability understandings, e.g., sustainability as 'deliverables' or a compliance exercise and inertia towards strategic decision-making for sustainability. The insights were coded in an affinity diagram (Appendix B). The emphasis on tools as helpful and the identification of similar barriers led us to envision how the design of a new object could accommodate some of the identified barriers and strengthen the consultants' ability to navigate and tackle the complexity of sustainability.

SECOND MAIN NEGOTIATION: Empowering sustainability consultants in navigating the complexity of sustainability

4.4 Re-framing and staging potential tool scenarios

In the next stage, we synthesised the ranking of the CDSs and NASs, object identification, and barrier-mapping into four design scenarios. These scenarios were built upon the existing challenges to stimulate further conceptualisation and allowed us to discuss relevant directions for the case study and design project. To ensure that this synthesis represented the consultants' concerns, the scenarios were translated into four 'tool concepts': 1) a tool that establishes a common sustainability language, 2) a tool that highlights the importance of prioritising iterations in project work, 3) a tool that emphasises sustainability work as strategic and ambition driven, and lastly, 4) a tool that emphasises how problem definition simultaneously defines the solution space to support project definition processes.

4.4.1 'Micro' negotiation on which tool to pursue

Via email, we invited the consultants to partake in a 'micro' negotiation of choosing a relevant direction. The email described how the interviews had led to the identification of four tool concepts and that the consultants were to rank the concepts according to their immediate interest and perceived relevance for the consultants' work. All six consultants responded to the email. Some provided more detailed reasoning for their ranking, while others simply responded with their ranking and nothing else. The responses showed alignment between the six consultants, all favouring the tool concept 3.

Tool concept 3 stemmed from the consultants pointing out that sustainability projects are seen as compliance exercises or mere deliverables rather than being of significant strategic value for the organisation. In the interviews, External Consultants 3, 4, and 5 noted that this neglect of the sustainability strategy work occurs on two levels:

- **Project level:** At project level, the consultants experience a sense of paralysis in decision-making among their clients and collaborators in sustainability projects, who often want to outsource decision-making to the consultants. The paralysis is caused by both a sense of inertia toward the sustainability project and a fear of making the wrong decision out of ignorance or inexperience.

- **Organisational level:** At organisational level, clients and collaborators participating in sustainability projects fail to recognise how execution of these projects can strengthen the organisations' overall strategic engagement with sustainability.

The insights from the negotiations about sustainability as a WP and specific barriers relating to sustainability strategy work, were synthesised into a preliminary design specification. The design specification presented relevant needs to develop a tool to support the consultants in advocating for ambitious sustainability projects, navigating inertia and strategic misalignment, as well as underlining the strategic valuation of both the day-to-day decision and for aligning individual projects with the larger sustainability strategic lines of the organisation.

4.5 Re-framing a tool for sustainability strategy work

Insights from a literature review on strategy, wayfinding, and strategy tools concerning WPs were arranged in an affinity diagram (Appendix C). Analysing the insights and how they correspond with each other highlighted three main themes: 1) framing of projects, 2) framing of actor roles within projects, and 3) framing of strategy. We translated these main themes into six key points (Table 5). The points represented key rationalities from strategy and process research on tackling WPs, which were synthesised with previous literary and empirical insights on sustainability work. This synthesis was done to elucidate how the rationalities in strategy work translated to the specific context of the sustainability consultants.

4.6 Staging a tool for sustainability strategy work

The aim of this negotiation was twofold: 1) to test the translation of the six key points, and 2) to collaboratively conceptualise a tool. External Consultant 3 and External Consultant 4 were invited to a co-design workshop to test the key points in the practical context. They were selected based on their representation of two different strategic levels within the same consultancy (A): Consultant 3 in a more practical project manager role and Consultant 4 in a leading sales and strategy role. This allowed the insights to be tested at both the project and organisational levels and for a negotiation on the interconnectedness of the levels.

Table 5: Identified six key points related to strategy work in tackling sustainability as a wicked problem.

Themes	Key points
Framing of projects	1) Projects require collaboration to establish a sufficiently tangible understanding, enabling navigation through sustainability complexity.
	2) Sustainability projects create strategic value and form part of a chain of sustainability efforts.
Framing of actor roles within projects	3) Sustainability projects entail significant complexity. It is the role of the sustainability consultant to facilitate wayfinding within this complexity.
	4) In project work, collaborators contribute with contextual knowledge, while sustainability consultants bring expertise on sustainability as well as generic models, tools, and methods.
	5) The good answers lie in the interaction between the sustainability consultant and the collaborator.
Framing of strategy	6) Strategy is not something you have; it's something you do; hence projects are a chain of actions with strategic sustainability value.

4.6.1 Materialising the six key points

A range of physical objects were shaped to support the facilitation of the negotiation space. First, a board was made to summarise the work performed both front- and backstage following the last interaction.

Four game boards were then prepared to visually take the two consultants through the framing of sustainability strategy work: 1) presenting how a project consists of a (non-predeterminable) string of actions; 2) describing how each action is an interaction and can be seen as a negotiation space between the external consultant and the actors involved in a given project; 3) and 4) representing potential following (sustainability) projects describing how each project is also part of a string of projects creating strategic value for sustainability. To support the translation, we prepared small inscriptions explicating the rationalities in a concrete example of Climate Accounting. After the rationalities were visually represented, the key points were written down on six pieces of paper to allow for concrete scrutinisation of the synthesis (Figure 4).

4.6.2 Conceptualising the tool

Materialities were also prepared to support the second part of the negotiation. Inspired by engineering design's morphology schemes, we identified three relevant tool 'characteristics'.

To examine 1) 'when' the tool should be used, a game board representing the timeline of a project was produced. To examine 2) 'where' the tool should be used, a visual division between the front- and backstage was inscribed in the board.

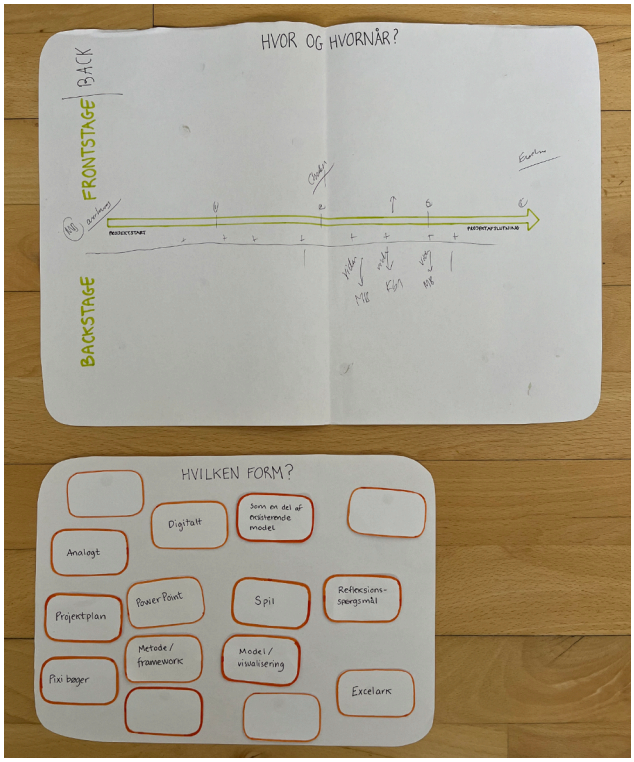

Figure 5: Materialisation of the game pieces.

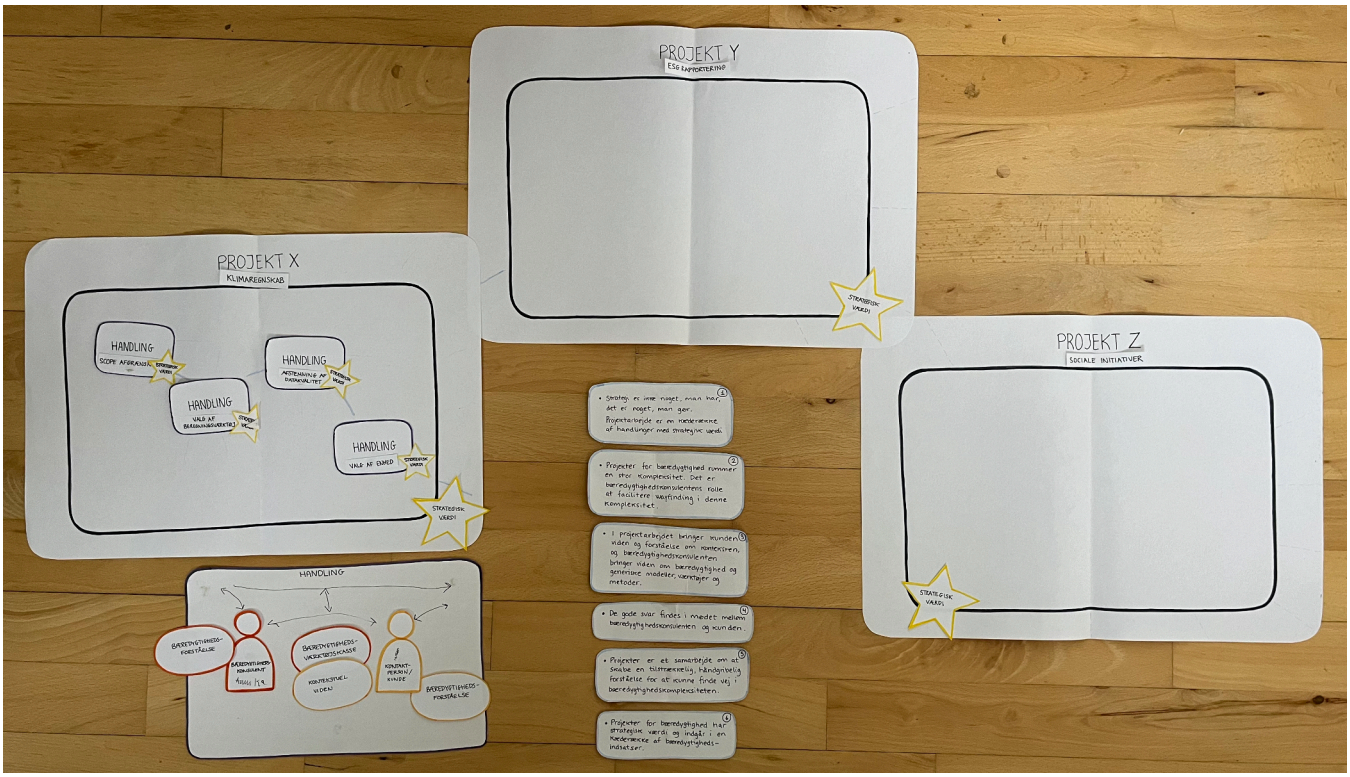

Figure 4: Materialisation of the six key points in the game boards.

And lastly, to examine 3) 'which shape' the tool should take, several game pieces representing possible shapes, e.g., framework and reflection questions (Figure 5, p. 13) were produced.

4.7 Negotiating a tool for sustainability strategy work

The negotiation took place at the office of External Consultants 3 and 4. Their initial responses demonstrated a significant alignment between the six key points and the practical context, as it fostered a strong sense of recognition in both of the consultants' work, making evident that involving consultants from both strategic levels significantly strengthened the negotiation.

4.7.1 Impact-driven, symbiotic collaborations as a central concern

The rationalities especially resonated well with the consultants due to an emerging focus on working with sustainability impact as their consultancy's central purpose and bottom line. Therefore, they advocated for a change in the perception of sustainability projects both internally (perceiving sales as cocreational sustainability value processes and not merely transactional) and externally (ensuring that sustainability projects are not perceived as mere deliverables).

4.7.2 Including backstage activities for collaborators

The visual representation of the project timeline, with its division between backstage and frontstage, supported the facilitation of the configuration of projects and different roles. However, as highlighted by Consultant 3, a backstage also exists at the collaborator level that likewise influences the project directions. This additional backstage was incorporated into the project timeline during the negotiation to enhance alignment between the inscribed objects and the consultants' context. The board representing the negotiation space between consultants and collaborators, allowed Consultants 3 and 4 to elaborate on a missing link between the two strategic levels. They attributed this missing link within their consultancy to a lack of continuous internal communication and knowledge sharing during projects.

4.7.3 Multiple frontstages

Moreover, the consultants noted that the division of actors operating on the different strategic levels also exists within collaborators' organisations. They specified how actors involved in the project level day-to-day strategic decisions rarely are the same as those in the organisational level strategy, further increasing the misalignment between the strategic levels. These insights led to the further realisation of two different frontstage negotiation spaces and how the misalignment of the strategic levels was partly rooted in a lack of connection between these negotiation spaces and actors.

4.7.4 The consultants' journey

The consultants noted that the six points resonated so well because they had also been involved in the first main negotiation concerning the CDSs and the NASs. Consultant 4 further stressed that a future tool should clearly state its purpose and rationalities underlying the perspective on sustainability consultancy work.

This led us to incorporate the framing of the CDSs and NASs to ensure that this understanding would translate to future consultants engaging with the tool. In the words of Consultant 3: "If they do not understand it, they won't eat it" in relation to the tool's viability in meeting novel sustainability consultants.

4.7.5 The six key points as a continuous awareness

During the negotiation, the project timeline game board was used to support the facilitation of a discussion on the project stages at which the six key points, collectively or individually, would be relevant. Here, the consultants highlighted that the key points were all relevant as a continuous awareness throughout the project process.

The consultants also emphasised that the tool could nurture sustainability impact by both reflecting how projects (and thus the creation of sustainability strategic value at the organisational level) already begin during the initial project definition and by supporting the 'bridging' of the gap between current and potential future projects.

4.7.6 A tool from the internal backstage to the frontstage(s) - and to the collaborator's backstage

Consultant 3 pointed out that the specific framing and verbalisation of sustainability projects, project roles, and strategic levels represented in the six key points was new to their consultancy. This stresses the importance of a backstage tool to support the incorporation of this framing into the backstage of the consultancy to support future tool engagement.

Furthermore, both consultants expressed a wish for an object that could work in frontstage negotiations,

strengthening the alignment between consultant and collaborator, by specifying how the collaboration should unfold and, not least, why. With the addition of the collaborators' backstage activities, it became clear that even though consultants are not directly involved in the collaborator's backstage, they should be aware of its presence and importance in integrating the two strategic levels. The consultants even voiced interest in an object that could circulate in the collaborator's backstage to represent the concerns identified in frontstage negotiations.

Both consultants expressed the relevance of a recognisable form to ensure future engagement with such a tool. Asked to pick out a specific tool formation, they selected six different kinds and further added a 'slide deck' and a 'playbook', thus reflecting their interest in a tool to accommodate a broad application.

Insights presented above were organised in an affinity diagram (Appendix D) and interwoven in the design specification to allow us to iterate on previous insights in light of novel ones. The synthesis of all these insights resulted in eleven specifications (Appendix E).

4.8 Re-framing the tool as a playbook

Inspired by Consultant 4's request for a 'playbook' and awareness of the 'richness' of matters of concerns presented during the negotiations, we decided to conceptualise the tool as a playbook for sustainability consultants, which led to two re-framings:

4.8.1 An operationalisation of the facilitator role

Because one purpose of the playbook is to inform and assist the consultants regarding the facilitatory role, we saw the need to provide more detailed description of this role. Therefore, we utilised the vocabulary from the SNS framework presenting how each frontstage interaction should be seen as a negotiation, which the sustainability consultant is responsible for staging and facilitating. In this, the power of objects was also further stressed as emphasis was put on the importance of consciously reflecting on what and how to negotiate.

4.8.2 Creation of three tool concepts

The continuous conversation between literature and consultants has led to a substantial detection of concerns, more than what could be fulfilled solely with the playbook. To accommodate these concerns, we formulated three tool concepts as examples of supplementary tools following the rationalities presented throughout the playbook. The three concepts were 1) The Sustainability Action Map, 2) The Project Negotiation Plan, and 3) an Introductory Slideshow for future collaborators.

4.8.3 The playbook

The content of the playbook was arranged to reflect the 'journey' that the participating consultants has been through (Table 6; Appendix F).

Table 6: Content of the playbook

	Content	Appendix F
1)	The framing of sustainability as a WP by presenting the Complexity Dimensions of Sustainability and the Navigation Approaches for Sustainability.	pp. 8-12
2)	The framing of projects as collaborative processes with sustainability strategic value.	pp. 14-15, 20-21
3)	The framing of projects as spaces of negotiations, where collaborators contribute with contextual knowledge, while sustainability consultants contribute with expertise on sustainability and generic models, tools, and methods.	pp. 15-18
4)	The framing of roles within projects, where the consultants facilitate wayfinding in the complexity and communicate that the good sustainability answers lie in the interaction between the actors.	pp. 14
5)	The framing of sustainability strategy as something you do and not something you have; thus, sustainability projects are chains of actions with sustainability strategic value.	pp. 20-22
6)	An introduction to the two sustainability strategic levels and how a better integration and alignment between these can strengthen the creation of sustainability strategy value.	pp. 24-25, 28-29
7)	An introduction to the power in objects, highlighting how objects can strengthen the consultants in wayfinding and during negotiations.	pp. 32-33
8)	An introduction to the four tool concepts, including a description of the tool's purpose, recommendations for its materialisation and usage with a visual example of such a tool. The visual example was made to accentuate the vitality of materialisation and served as an inspirational starting point.	pp. 35-43

4.9 Staging the tool as a playbook

Consultants 3 and 4 were invited to a second negotiation to test the tool as a playbook and whether it provided sufficient terminology to understand, vocalise, and operationalise the inherent complexity of sustainability and the important facilitating work the sustainability consultants must navigate and perform. The playbook was materialised as a printed PowerPoint slideshow and was handed out to the consultants at the negotiation.

4.10 Negotiating the playbook

During the negotiation, both consultants emphasised the strength of the playbook and stressed how it successfully conveyed the work they performed as sustainability consultants. Furthermore, they underlined how it enabled them to better verbalise the emergent strategic value accumulated throughout a project and specify their own role in this strategy work to collectively create an impact for sustainability. As Consultant 4 put it, the playbook does not necessarily convey groundbreaking nor unknown points but "it captures it in a way that at least none of us have been able to".

4.10.1 The playbook as an 'on-boarder', an 'upskiller', and a management tool

Throughout the negotiation, both consultants highlighted distinct ways in which the playbook could be utilised as part of onboarding new employees and for general upskilling of the consultancy team. As Consultant 3 noted, the playbook provided strong background knowledge, "it's good to have all this insight to be able to navigate with a little bit more peace of mind.".

They also referred to the playbook as a project management tool with a built-in openness towards unknown factors that always unpredictably shape project work and call for iterations and alterations. They appreciated how the playbook continuously emphasised how projects can suddenly take novel turns requiring alterations, and, as long as it is responsive to the specific context, alterations are completely fine or even applauded as a sign of successful navigation and facilitation.

4.10.2 Actor mapping as a fourth tool concept

All three tool concepts resonated strongly with the consultants, who appreciated how easily they could be contextualised. Immediately, both consultants began brainstorming on how the tool concepts could incorporate the existing toolbox of the specific consultancy and how they could initiate the mapping of directions, negotiations, and observation points in projects.

The consultants requested a more nuanced and actionable representation of how 'much' actors bring into a project and how heterogeneous this could be. The consultants called for the ability to explicitly map out these different disciplinary backgrounds, professional positions, and sustainability knowledge and ambitions. Consequently, we conceptualised a fourth tool concept, 'Actor Mapping', describing and prescribing an operationalisation of exactly that.

4.10.3 Remember 'the big why'

The consultants furthermore saw potential in the playbook to indirectly support consultants in upskilling the organisations they collaborate with. Following this, they expressed central missing point in the playbook: 'the big why' – why collaborators should 'get on board' with the sustainability agenda. The consultants even expressed that they themselves (and other consultants) could sometimes use a reminder of 'the big why'. Therefore, we explicitly inscribed this argumentation to further strengthen engagement with the playbook and its points.

4.11 Staging and negotiating the playbook's relevance and usefulness

To ensure a broader relevance and usefulness of the tool, the researchers invited In-house Consultant 1 and External Consultant 5 to two individual negotiations on the materialisation of the tool. This negotiation revolved around the playbook, which both consultants expressed positive feedback on. Both consultants recognised the playbook support in vocalising sustainability as strategic and ambition driven as well as conveying and operationalising the facilitatory responsibility of the consultant. The external consultant complimented both the readability and the layout, stressing "I really think this got something", and noted that they had already shared parts of it with colleagues and managers.

5 | DISCUSSION

This article set out to investigate and analyse how a collaborative design approach centred around the notion of wicked problems can strengthen sustainability consultants' understanding and navigation of the complexity of sustainability projects.

5.1 Facilitation work is design work

As Rittel and Weber described in 1973, the expertise needed when dealing with WPs is distributed over many different people. As forces of fragmentation are inevitable in group collaborative efforts (Kpamma et al., 2017), collaborative processes should be steered by facilitators (Ibid.) or decision-making experts (Mieg, 2006) responsible for *designing* and managing the process towards synthesis(es) (ibid.).

The negotiatory element has been accentuated in the academic literature examining how to tackle WPs (Jarzabkowski & Kaplan, 2015; van Tulder, 2018; Veltman et al., 2019; Schweizer et al., n.d.). Through this synthesis, we recognised the potential in framing facilitatory work through the lens of SNS and utilised its rationalities to operationalise the sustainability consultants' facilitation work. Therefore, the playbook emphasises how staging and facilitation work is design work, thereby engaging sustainability consultants as stagers, facilitators, and designers of projects and processual creation of sustainability strategy value.

5.2 Complexity as dimensions and relevant approaches

To navigate the complexity of sustainability, we must understand what this complexity consists of and what this means for our context(s). Our framing of sustainability as WPs through the CDSs and NASs clearly resonated with the consultants. Echoing Neugebauer et al. (2015), Luederitz et al. (2021), and Preuss et al. (2023), the consultants emphasised how they experienced this framing as an apt way to describe their daily practice.

Furthermore, they voiced how framing sustainability as a wicked problem added an important alternative understanding of sustainability, separating itself from the way businesses traditionally approach sustainability such as a more 'thematic' descriptions like the triple bottom line (Brønn & Brønn, 2018). By emphasising inherent complexity and interconnectedness, holistic elements of sustainability are amplified by the WP framing. Thematic framings are based on 'compartmentalisation' into different focus areas, blurring the integratedness. By stressing wickedness and indeterminacy, the arguments for novel problem definition and solution processes are vocalised. As Rith and Dubberly (2006) points out, solving simple problems will lead to improvement but not innovation. To actually enable innovation for sustainability, we must re-frame towards wicked problems.

5.3 Navigating through design

The case study clearly illustrates the multiple ways in which design can be a valuable approach to solving complex sustainability problems. The case study and inscription work reflected the high flexibility of design (Buchanan, 1992) including 1) presenting theoretical abstractions (the CDSs and NASs) to the general but contextualised rationalities (e.g., symbiotic collaborations), 2) actionable translations of SNS (e.g., facilitating negotiations), and 3) presentation of specific operational tools to be further contextualised.

5.3.1 The difficulty of Heterogeneity

From the case study and its negotiations between literature and sustainability consultants' practical experience, it became clear that an integrated part of working as a sustainability consultant is navigating and handling conflicting stakeholder understandings, values, and interests. This heterogeneity was identified as the most difficult CDS for the sustainability consultants to tackle and navigate. Conflicts cannot be avoided in processes of dealing with multiple actors, stakeholders, and concerns (Weber & Khademian, 2008; Adelson et al., 2023). This was explicitly elaborated by Consultant 1: "although it [Heterogeneity] is a beautiful thing (...), you need to have all diversities included in your project. They should sit around the table but how do you handle the conflicts that arise, and how do we handle it in a thoughtful way?". The Heterogeneity CDS is also challenging when there is a lack of general understanding of the 'subjectivity' rooted in project scoping and definitions. As Rith and Dubberly (2006) point, even the very definition of a problem is subjective, a point which the consultants called for help in conveying to collaborators in the early phases of projects.

5.3.2 Staging Negotiation Spaces to frame facilitation

The SNS framework supports navigation of the complexity of sustainability and facilitation of sustainability strategy work in several ways. First and foremost, through SNS the consultants are sensitised to stage negotiations that bridge generic insights and knowledge on sustainability and a methodological toolbox to the very specific situatedness of the project context, acknowledging the importance of both types of knowledge (Mieg, 2006). The long-term focus called for in sustainability and WP literature (Levin et al. 2012; Canal Vieira et al., 2024) should thereby be represented through the sustainability consultants' holistic understanding of sustainability and their inscription of this in tools and models.

The focus on staging and re-framing can induce sustainability consultants to exhibit humility (Schweizer et al., n.d.), empathy (Earle & Leyva-de la Hiz, 2020; Schweizer et al., n.d.), and understand their work as a continuous learning experience (Crowley & Head, 2017). The playbook's emphasis on the open-ended process of designing objects and creating tools compliments the uniqueness when tackling wicked problems in local contexts (Rittel & Webber, 1973; Crowley & Head, 2017; Schweizer et al., n.d.). It further accommodates how actors' goals and agencies shift through the use of tools (Jarzabkowski & Kaplan, 2015), resulting in the need for novel tools.

We further argue that the SNS framework accommodates the integrative division between the purposeful and the purposive (Bouty et al., 2019; Burke & Wolf, 2021). Through its focus on staging, SNS embodies the purposeful and planned elements while leaving room for unintended and unplanned purposiveness by emphasising the importance of re-framings. The focus on re-framings also creates a focus on capturing "detours" - the important cycles of spin-off (Burke & Wolf, 2021).

5.3.3 Materialisation work and the playbook

Notably, the continuous materialising work as well as the cycles of staging and re-framing enabled the playbook to represent academic insights and capture the context of the sustainability consultants "in a way that at least none of us have been able to" (Consultant 4). This lends support to van der Marel and Björklund's (2022) account of how the ability to bring visibility to complexity is one of the core values and contributions of designers. Thus, designers can bring tangibility to things that seem intangible. The playbook further reflects the importance of this by continuously focusing on the design of objects and tools (Veltman et al., 2019; Pedersen, 2020; Pedersen et al., 2023).

The playbook does not provide clearcut and "correct" answers or pathways as literature shows that this is not possible (Jarzabkowski & Kaplan, 2015; Chia & Holt, 2009). Instead, the playbook is designed to empower consultants by providing terminology and operational framework through which to understand, perform, and vocalise essential aspects in their field of work. Thus, the playbook offers suggestions for both the strategic 'What shall we do?' and the actionable 'How should we do it?' (Brønn & Brønn, 2018).

We also want to note that the playbook supports sustainability consultants in becoming collaborative capacity builders (Weber & Khademian, 2008). It does so by 1) framing sustainability as a WP, 2) providing arguments for the consultant's role as facilitator, 3) presenting practical ways to perform this facilitatory role and support projects and initiatives leading to the transfer, integration, creation, and application of new insights for sustainability.

Utilising the SNS framework, in turn, also reflected back on the affordances of the framework itself. The case study sensitised how the division between front- and backstage covered both interrelated, concurrent evolving frontstages as well as an active backstage for the collaborator(s). This led us to expand on the framework to further map how different actors and concerns circulate in collaborations, emphasising how professional actors' thoughts and actions are situated in robust networks of other stakeholders, strategies etc. (Pedersen, 2020).

5.4 Creating sustainability impact

As the consultants mentioned throughout multiple negotiations, the overall aim of 'it all' is to support organisations in creating sustainability impact. To build better practices and solutions than we have today (Levin et al., 2012; Waddock et al., 2015; Brønn & Brønn, 2018; Termeer & Dewulf, 2019; Adelson et. al, 2023). In this, design continuously has a role to play.

5.4.1 Progressive incremental work and "small" wins

The playbook utilises the SNS framework's cycles of framings and re-framings to track and identify important changes and successful initiatives resembling the line of thought in the Termeer and Dewulf's (2019) small wins framework. Staging and materialisation work as a means to visualise progress, thereby encouraging actors to reflect on the accumulation of small wins and how insights can be utilised in the future (Termeer & Dewulf, 2019). It allows for collective learning cycles through these incremental steps (Ibid.), while respecting how each attempt to tackle the wickedness is consequential (Rittel & Webber, 1973; Schweizer et al., n.d.). The SNS framework further acknowledges how changes are a premise of design work. This compliments an important scholarly refusal to approach impact forecasting and assessments linearly, as sustainability-focused innovation processes themselves are effectuated through

emergent sustainability strategy work (Bouty et al., 2019; Burke & Wolf, 2021; Coffay et al., 2022). These small wins might not be so small. For example, Levin et al. (2012) argue that a number of small policy changes can have significant transformative effects if they trigger further path-dependent processes. The consultants explicated how a great focus goes into the upskilling of collaborators in sustainability. This is driven by an aim to create stronger and more rooted sense of what sustainability is and by defining collaborators' role in sustainability projects. While this is a longsome process, Levin et al. (2012) stress how progressive incremental pathways incorporate, rather than bypass, the Urgency CDS. In order to overcome both paralysis and simplification (Termeer & Dewulf, 2019), we must therefore perform the work that creates impact by building, integrating, and applying novel ways of working together for sustainability – the work that the playbook is designed to support.

5.5 Further research

This article presents a single case study involving six sustainability consultants from five different Danish organisations. This, of course, means that its findings may be localised – an unavoidable characteristic of this type of research and methodology. An obvious next step, then, would be to investigate how and whether the article's findings, including the playbook, could transfer to other contexts. This could be done by conducting similar design-led case studies in other organisational and national settings. Therefore, we call for further research on how the design framework Staging Negotiation Spaces can empower sustainability consultants – and even other sustainability practitioners.

6 | CONCLUSION

Overall, this article offers useful terminology to present the inherent complexity of sustainability, and what this means for sustainability projects, as well as an actionable framing of how projects can be facilitated to build sustainability strategic value.

It demonstrates how the concept of wicked problems provides a strong framing for the complexity of sustainability in the context of sustainability consultants. This framing recognises the indeterminacy of sustainability and provides a terminology for four complexity dimensions of sustainability and five relevant navigation approaches for sustainability.

The task of building sustainability strategies and creating innovative solutions for sustainability is a collective one. Through Participatory Design, Actor-Network Theory, and Staging Negotiation Spaces, we have demonstrated the potential in framing sustainability consultants as facilitators of collaborative sustainability projects and sustainability projects as ongoing negotiations for ambitious sustainability strategy work.

These insights were based on a design-led case study with six sustainability consultants – both in-house and external – based in Denmark. Throughout the case study the SNS framework provided both an analytical lens and an actionable framework to facilitate the continuous conversations between theory and practice.

The ongoing negotiations were supported by the use of objects. By staging a negotiation space around the playbook as a representation of the synthesised insights and mediated a discussion on the desired functions of the playbook, allowing us to translate relevant matters of concerns and important relations of the consultants (Latour, 2005). Consequently, the playbook succeeded in creating a common language between us and the consultants, thus acting as an intermediary object (Pedersen, 2020; Pedersen & Brodersen, 2020).

This common language was inscribed through iterations on the playbook enabling it to better represent the synthesis between academic insights and the consultants' work. The aim of the established terminology is not to present the "correct" way that design should look in a sustainability consultancy context but to present a helpful one. This is why the four tool concepts are framed as examples. They represent important rationalities and translate these to the consultants to mediate a conversation on how such tools could be adapted and adopted in the specific consultancy or organisation. Therefore, the playbook has great potential in offering terminology for sustainability consultants in a wider context beyond this specific and localised case study.

Overall, the article urges consultants, as well as scholars, to engage with the potential of design and to follow – and facilitate – negotiations for sustainability.

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APPENDICES

APPENDIX A: Affinity Diagram on wicked problems, sustainability, and design in a business context

APPENDIX B: Affinity Diagram on empirical insights from interviews on sustainability as a wicked problem

APPENDIX C: Affinity Diagram on strategy work and decision-making processes regarding wicked problems

APPENDIX D: Affinity Diagram on empirical insights from workshop on rationalities in sustainability strategy work

APPENDIX E: Design Specification

APPENDIX F: The playbook