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Design for Sustainability Transitions: Reflections on Practice

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Abstract: Transition Design or design for sustainability transitions is acknowledged as an emerging design research and practice area. Although studied and practiced as part of research consortiums for a while, design for transitions has only recently started to be adopted by design practitioners and consultancies with only few examples worldwide. Hellon, a design consultancy based in Finland and the UK, has been actively searching for implementing ideas from design for transitions and have successfully been involved in a set of relevant projects during 2017-2021. These projects include helping the Prime Minister's Office of Finland to consolidate a sustainability report with co-created input from all Finnish ministries, designing "Nordic Urban Mobility 2050 –Futures Game" –a gamified process for facilitating mobility transitions stakeholders to co-create mobility futures scenarios– and developing "Sustainable Futures Game" –a gamified process to assist companies to co-imagine desirable alternative near future scenarios in alignment with the intergovernmental ambition to achieve Sustainable Development Goals. In this article, as a transdisciplinary team of three design practitioners and one researcher, we present these examples as case studies and share reflections and critical insights on enablers, challenges, and opportunities for implementing design for sustainability transitions in practice and provide suggestive evidence for the contributions of design-led approaches in transitions contexts. In the case study, the projects' design facilitated collaborative imagining of desirable futures and the visual artefacts created provided easy entry for the participants into the complexity of systemic change processes. In the end, individual designers taking incentive in actively pursuing projects and allowing organizational environments as well as collaborating with academic partners have been identified as key enablers of undertaking DfST in commercial design consultancy practice contexts.

Keywords: Sustainable design - Transition design - Design for sustainability transitions -Co-design - Design practice - Design agency - Case study - Finland

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1. Introduction

Transition Design (Irwin 2015) or design for sustainability transitions (DfST) is an evolving area of sustainable design research and practice. DfST combines theoretical frameworks, methods, and approaches from, for instance, transition management, anthropology, design research, and sustainability science with the aim of identifying, analyzing, and establishing processes and collaborations to contribute to long-term societal transitions towards more sustainable societies Gaziulusoy & Öztekin, 2019). Although studied and practiced as part of research consortiums since the late 1990s, particularly in the European Union (EU), DfST has only recently started to become more widely known among design practitioners and consultancies. There are only a few examples of framing sustainability transitions through a design lens worldwide or sustainability transitions projects that have used design practice explicitly (these examples can be found in Ceschin & Gaziulusoy, 2020, Chapter 11). As there is an increasing interest by governments and businesses in engaging with sustainability transitions, and as the climate and biodiversity crises have

become topics requiring urgent action, demand and supply of sustainability-related consulting services have also increased. However, currently the majority of services in demand and supply mainly deal with addressing impact reduction in the short-term such as carbon accounting and foot printing in alignment with national targets of reduction. Although this work is crucial and fundamental, there is also an urgent need for transformative action that requires societal actors to collaborate and strategize for long-term and systemic structural change. This kind of change requires intervening in the deep leverage points that deal with intent and design of systems (Meadows, 1999; Abson *et al*., 2017) and call for measures beyond quantitative reduction targets.

There is early empirical evidence suggesting that design as a discipline, a profession, and a particular way of problem structuring and solving is capable of playing multiple roles in societal structural changes (Gaziulusoy & Ryan, 2017). However, for several reasons, it has been a challenge for early adopting design consultancies to find clients interested in DfST practice. First, sustainability transition projects –which are different from the traditional and short-term commissions that design consultancies engage with– last for multiple years and are generally undertaken as hybrids of research and implementation projects. They are funded through tailored instruments that are not easily accessible by design consultancies unless they are invited by consortium leaders. Second, transition projects mainly operate at the policy level, despite their highly experimental nature and regardless of the importance placed on transdisciplinary research, for reasons that are not yet empirically investigated. Therefore, both design scholarship and design practice has not been sufficiently acknowledged as relevant and useful in transitions research, leaving design discipline mostly outside of the radar of consortium forming efforts. Finally, being a new area of design research and practice while having been largely built on theoretical and methodological frameworks of a multiplicity of disciplines, DfST has not yet created its own practice-based legacy or established its unique usefulness. For these reasons, DfST had to be embedded in traditional practices of design consultancies as opportunities arose in the form of, for example, clients willing to try out new and experimental approaches. In this article, as a transdisciplinary team of three design practitioners and one researcher, we study exploratory examples from the work of Hellon, a design consultancy based in Helsinki and London, with the aim of collaboratively reflecting on the success factors, challenges, and opportunities for implementing DfST in practice and sharing critical insights and theoretical implications.

More specifically, we follow a case study methodology (Yin, 2014) focusing on three projects undertaken by Hellon between the years 2017 and 2021. Each case study is presented starting with the background of the project, followed by project description, methods and tools utilized, project outcomes, and reflections. Here, the background section explains the process of Hellon Oy getting involved in the project and provides the grounds for analyzing the challenges and opportunities of becoming involved in a DfST relevant project in a commercial setting such as a design agency. Next, the project description situates and discusses the project with references to DfST theory. The outcomes then present the observed and potential impact of the project. Finally, the reflections present the success factors, challenges, and opportunities of DfST implementations in commercial design practice with the aim of deriving practice-relevant insights for DfST theory.

The case studies are presented in the next section. Section 3 provides a discussion that synthesizes findings of each case study and elaborates on the joint conceptual themes and tensions observed. The article is finalized with conclusions.

2. Case Studies

Our selection of DfST informed case studies includes the following:

Case Study 1 (CS1, year: 2017-2018): Designing a sprint model for drafting "Opportunities for Finland" in a cross-ministry collaboration. Opportunities for Finland is the joint outlook by all Permanent Secretaries of the ministries on the key issues for the upcoming government term. The project was commissioned by the Prime Minister's Office (PMO) in Finland.

Case Study 2 (CS2, year: 2018-2019): Designing a gamified scenario co-creation tool "Nordic Urban Mobility 2050-Futures Game" and facilitation for co-creation of mobility futures scenarios. The project was commissioned by Nordic Innovation.

Case Study 3 (CS3, year: 2020-2021): Designing "Sustainable Futures Game," a gamified process to aid companies to co-imagine desirable future scenarios in alignment with the intergovernmental ambition to achieve Sustainable Development Goals. The project is part of an EU Horizon-funded consortium.

We consider these projects as DfST projects for the following shared attributes: **1.** They have long-term future perspectives; **2.** They aim to probe systemic, alternative scenarios for sustainable futures; **3.** They aim to facilitate collaboration of multiple stakeholders around this shared goal.
We followed a case study methodology (Yin, 2014) complemented with design research. We have been actively intervening in the processes we have observed, and therefore we also built upon approaches coming from action research and ethnographically informed qualitative research. All the authors have participated with an active role in one or more of the experiments, authors 1 (A1) and 4 (A4) have been involved in specific instances of all three case studies, while authors 2 (A2) and 3 (A3) participated in CS2 and CS3. We specify the roles in the following case descriptions.
Our data includes participant observation and field notes from the design process, including meeting notes from planning meetings and workshops where experiments and design prototypes were developed in collaboration with other stakeholders. The data also comprises an interview with the individual commissioning the project from the PMO and three participant surveys (CS1). In addition, we draw from our documentation (including images, video documentation, texts descriptions, and visual sketches) of the staged events (e.g., the gaming workshops and sessions, the design sprint) and participants' answers to online feedback questionnaires.

2.1. Case Study 1: Opportunities for Finland Report

2.1.1. Opportunity Finding

After having been introduced to DfST through a formal training delivered by Terry Irwin and her colleagues from Carnegie Mellon University in 2017 and informal exposure to DfST through interactions with A2 (who is a Helsinki-based academic and DfST expert), the design director of Hellon (A1) actively started to search for opportunities to implement DfST projects as part of their service portfolio.

With the aim to find suitable organizations to collaborate with, A1 approached D9 –a design and digitalization consulting team situated in the State Treasury of Finland. D9 was originally established as a two-year experiment during 2017-2019, with the aim to provide different government units with practical help and advice in human-centered and user-friendly public digital services (Finnish Government, 2017).

During the same time, the PMO was preparing for Finland's upcoming parliamentary elections in April 2019. As a part of this work, the office was preparing a joint report with all the permanent secretaries of each ministry within the government (i.e., the top level of permanent civil servant executives in Finland) with the aim to provide a "joint outlook" of difficulties and possibilities for the next governmental period (2019-2023) as well as to document the long-term challenges facing Finland and the Finnish government. The aim of the report was to address the very much needed large-scale societal reforms that were required to sustain the Finnish welfare state, considering the pressure stemming from, for example, the aging population and sustainability issues. The overall aim of the report was to support the election debate as well as encourage the next government to pursue difficult decisions that were needed to address the societal reforms (J. Varanka, personal interview, March 1, 2019).

This preparation process was a unique and novel approach to the PMO due to its joint ministerial approach, driven by a growing need for forming a unified governmental approach throughout the report. However, with the constrained resources and time limitations, the traditional cross-ministerial working groups were too cumbersome to organize, and therefore a novel collaborative process for co-creating the report was required.

Due to these challenges, the PMO decided to explore more experimental working methods to facilitate the process. Consequently, they reached out to D9 for advice, who, in turn, contacted Hellon to support the work. As a result of negotiations, in the beginning of 2018 Hellon was commissioned by the PMO. In short, Hellon's brief was to design a collaborative sprint method to facilitate an effective cross-ministerial co-creation of the *Opportunities for Finland Report*. The commissioned project was, according to the client, a part of a larger body of work that aims at providing a knowledge base for the next government, especially for the making of the government program, which is the most important single strategy document in the country. In addition to contributing to the report, the aim of the project was to explore alternative methods working together in order to bridge silos between different ministerial offices (J. Varanka, personal interview, March 1, 2019).

2.1.2. Project Description, Methods, and Tools

The project was launched in the beginning of 2018, and the team included sub teams from Hellon, D9 and the PMO. The team together designed and facilitated three design sprints for the invited representatives of all 12 ministries in Finland. Each of the sprints involved 30-40 participants selected by PMO. A1 participated as a facilitator in sprints 1-2 and A4 in the final sprint.

At the time of the project, all the ministries in the Finnish government were driven by three shared purposes (translated from Finnish): (**1**) Sustainable Growth; (**2**) Stability and Security; and (**3**) Decreasing Inequalities. It was decided that one design sprint would be organized to address each of the purposes (J. Varanka, personal interview, March 2019). Furthermore, the sprints were framed according to the drivers of change identified by the PMO. These included wicked problems (Rittel and Webber, 1973) such as climate change, aging population and sustainability of public finances, technological transformation and its impact on work, increasing inequalities, and the need for international immigration. To frame and guide the discussions in the sprints, the PMO prepared a short introduction to the themes, and it was circulated with the participants prior to the sprints.

The design process was kicked-off by defining joint objectives for the sprints and forming a common thematic structure and working methods. The DfST approach was introduced to the team by Hellon, and some elements such as challenging existing paradigms, systems thinking, and sustainable futures were chosen to guide the teams' efforts. The team agreed on the importance of including citizen perspectives when creating recommendations for Finland. Thus, to bring citizen voices into the sprint, the team produced short video interviews related to each theme in question. In addition, they acknowledged the need to move beyond mapping and analyzing current problems to identifying and explicating desired futures.

The first sprint on the topic of Sustainable Growth was selected as a pilot to validate the approach. D9 and the PMO participated in the co-design process to validate the methodology. The Hellon team facilitated the process with iterative working methods. The process started from designing the pilot sprint, and thereafter testing the structure and exercises with a group of participants from different ministries through a half-day pilot session. The pilot sprint provided insights to understand the challenges and resistance points of the participants to iterate the model accordingly. Overall, the pilot sprint model was seen as a valuable tool to facilitate cross-ministerial co-creation, and consequently the iterated sprint model was approved to be launched with actual participants for the first sprint in the beginning of 2018. Later in the spring, the second sprint on "Stability and Security" was organized. The final and third sprint on Decreasing Inequalities was held in Autumn 2018.

The initial two-day sprint model was designed to guide participants through initial problem mapping and root cause analysis to ideation for solutions to formulating final insights as recommendations. The sprint model was built based on design-inspired techniques and methods such as round robin ideation exercise, personas (e.g., including a yet unborn Finnish child) and analysis and peer-feedback of suggestions to the report. The Hellon team designed the canvases used in the different phases in the sprint *(See Figure 1 y 2)*.

Figure 1. Hellon Team Testing the Templates in the Test Sprint (Photo: Laura Lerkkanen; Copyright: Hellon).

After each sprint, feedback was obtained via online questionnaire and informal discussions from the participants. Subsequently, the team improved the sprint model with an iterative approach according to the learnings.

2.1.3. Outputs and Outcomes

The project produced two main results: **1.** A scalable and transferable design sprint model for collaborative policy development; **2.** Recommendations for the preparations of the "Opportunities for Finland" report. The report was published by the PMO in January 2019, and it put forward a collective outlook of the permanent secretaries of the ministries on the key issues for the then upcoming 2019-2023 government term. The report described the main drives for change and transformation phenomena, and suggested a number of solutions that can have a significant role in the next government term (Finnish Government, 2019).

According to feedback surveys conducted after each sprint, over 80% of the participants evaluated the sprints as good alternatives to the existing ways of working, and said that they would join a similar event in the future. Here, the participants were given a scale of 1-5 in an online survey, and the percentage was calculated from the average of all sprints.

In addition to the sprint specific outcomes, the project strengthened the understanding of applying design methods and design-led approach in governmental work. According to J. Varanka (personal interview, March 2019), design methods will be also used in future projects –e.g., in establishing the new government after the elections.

Figure 2. Participants of the first sprint "Sustainable Growth" are mapping key possibilities on canvases provided (Photo: Zeynep Falay von Flittner; Copyright: Hellon).

2.2. Case Study 2: The Nordic Urban Mobility 2050 - Futures Game

2.2.1. Opportunity Finding

In Spring 2018, Nordic Innovation was looking for a partner, under their Nordic Smart Mobility and Connectivity Program, who could prepare foresight analysis and build different scenarios for mobility in 2050. The main objective of the tender was to find new creative ideas for scenario work that would be easy to communicate to a wider public and that would facilitate conversations and collaborative work among Nordic municipalities and mobility system stakeholders (Nordic Innovation, 2018).

Hellon participated in the public tender with their proposal that was led by A1. In order to create a rigid methodological framework for preparing the foresight analysis, they partnered with A2, an academic with expertise in DfST. Moreover, Hellon's proposal was inspired by and built upon a framework developed within the Visions and Pathways 2040 project (Ryan *et al.*, 2016), which aimed to create alternative scenarios for 2040 to inform low-carbon futures in Australia during 2013-2016. This framework combined design research and futures studies and was based on methodological approaches from the systems innovations and transitions field.

The project had two key objectives: **1.** To define and deliver a set of mobility scenarios for Nordic city futures that can provide strategic insights for municipalities and input for decision making; **2.** To encourage different stakeholders, primarily mobility players and idea owners, and to develop novel project proposals and solutions for urban mobility.

2.2.2. Project Description, Methods, and Tools

The project started with desktop research that included a literature review and benchmark study on existing scenarios in the future of mobility and transportation. In addition, some members of the project team participated in events and network meetings related to mobility futures and transitions to understand relevant key issues. Based on this work, the team identified key drivers of change that industry experts agreed upon. To validate and enrich these findings, the team conducted thematic expert interviews. Additionally, these interviews also provided insights on emerging modes of mobility and aided in prioritization of key drivers of change and identifying critical uncertainties

In the next phase, the team identified the critical uncertainties associated with mobility transitions as well as "Nordic Anchors" –the key strategic areas for mobility transitions in Nordic countries based on the publications from Reeves (2017) and Borges *et al*. (2017). After gathering insights from the field and relevant stakeholders, the design team from Hellon suggested combining the obtained insights and knowledge into a design of a gamified process and a design game as defined by Vaajakallio (2012), instead of a conventional report of foresight analysis and a discussion starter. The key idea regarding the Nordic Urban Mobility 2050 – Futures Game was to facilitate the co-creation of future mobility scenarios together with relevant stakeholders, instead of delivering a set of t scenarios that summarize the state of the art and the most likely visions on the future of urban mobility in Nordic cities in 2050 as defined in the original tender document. Here, even if Nordic Innovation was seeking new and creative ideas for achieving their objectives, they had not envisioned an approach such as a design game. Thus, after negotiations, it was agreed that the project output would be changed into a more impactful yet experimental format *(See Figure 3)*.

Figure 3. Hellon Designers Testing the First Prototype of Nordic Urban Mobility 2050–Futures Game (Photo: Juha Kronqvist; Copyright: Hellon).

To design the Nordic Urban Mobility 2050–Futures Game, the team first translated the collected insights and information on various textual and visual game elements. Subsequently, a game logic and physical board game was developed through an iterative design process, meaning that the early prototypes were tested first internally and thereafter with invited guests in real-life gatherings. The elements of the finalized game included: **1.** 12 base world cards representing different critical uncertainties about the future as well as a foundation that the scenarios are built on; **2.** future persona cards, representing different points of views of the future stakeholders; **3.** mobility system elements, such as infrastructures, form of energy and modes of mobility; **4.** discussion cards; and **5.** reflection and evaluation cards *(See Figure 4)*.

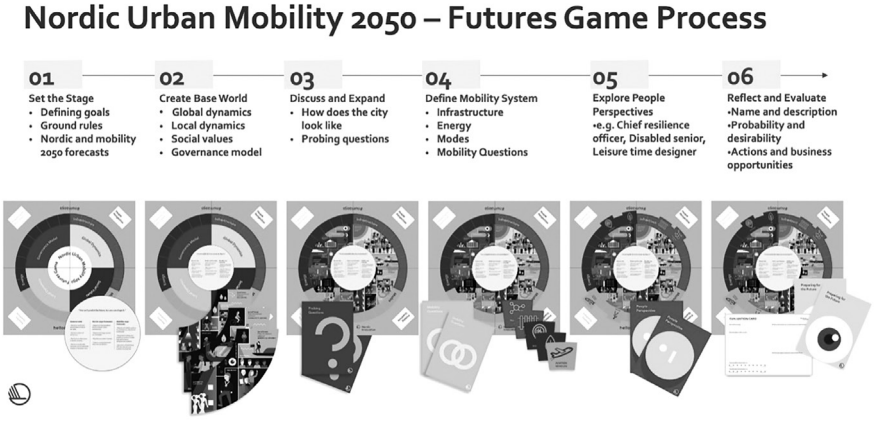

Figure 4. Six Steps of Nordic Urban Mobility 2050-Futures Game (Illustration Source: Final Project Report).

2.2.3 Outputs and Outcomes

The key output of the project was The Nordic Urban Mobility 2050 – Futures Game, which brings multiple stakeholders –citizens, public authorities, and incumbent and niche mobility solutions businesses– together to create desirable future narratives of Nordic cities in 2050. During the first part of the game, the players co-create a potential future state of the world in 2050, which they elaborate through stories of everyday life. In the second part, emerging and possible mobility solutions are imagined that could be situated in the future world state as created in the first part.

Through predefined steps, the game guides players to together imagine a world state for Nordics in 2050 by exploring social interactions, lifestyles, and values. With the provided game elements, the participants choose plausible modes of mobility and build a sustainable and robust infrastructure from the provided building blocks. The game session aims to end with participants' considerations of the impact and desirability of the co-created scenarios. The game has been played in multiple events including the Connected Smart Cities Conference in Brussels, 2019 and Nordic EV Summit as well as in a workshop for Nordic municipalities in Kongens Lyngby in 2020. In addition, game elements were published online for open access (Nordic Innovation) to anyone who would like to host their own sessions to facilitate a discussion on mobility futures and transitions with others *(See Figure 5)*.

Figure 5. Nordic Urban Mobility 2050–Futures Games Players in Brussels (Photo: Dorde Tomic; Copyright: Nordic Innovation).

2.3. Case Study 3: Sustainability Futures Game

2.3.1. Opportunity Finding

In the beginning of 2019, Hellon was invited by Aalto University to join in drafting a project proposal dealing with the role of creative industries in creating societal transformation for a Horizon 2020 funding call. At the same time, A4 was seeking opportunities to involve Hellon in projects aiming to address the complex and systemic societal issues. Further, another incentive was to create opportunities for Hellon to actively take part

in contributing to social and ecological sustainability in partnership with other creative agencies and research institutes; in turn, the agency could develop its own creative practices on sustainability transitions. Therefore, Hellon accepted the invitation to join the consortium project proposal, which later received funding. A1 and A3 have actively been taking part in the project with other designers in the company (see Acknowledgements).
The project consortium includes 11 partner institutions that bring together four universities and five creative teams and enterprises associated with creative approaches to transformation and sustainability. The project aims to support creative practitioners and policymakers in driving societal change to address sustainability issues.
The participating research partners created the foundation and framework for the ongoing project (2020-2022). The framework consists of three elements: (1) An observatory to map existing transformational creative practices; (2) A laboratory to support new experiments and exploration with various relevant stakeholders; (3) An evaluation phase to assess the impact of creative practices on societal change. Of these three elements, Hellon's project was built around element 2.
More specifically, the project idea was based on the experiences noted in CS1 and CS2, which strengthened the conviction of the design agency on the need for novel processes to aid collaborative exploration of sustainable futures, while simultaneously building on and further developing their relevant design competencies and capabilities. It was decided to build the project idea on the design game developed earlier in CS2 by extending the focus from mobility to broader sustainability challenges and shortening the timeline from 2050 to 2030. With this new focus, the design game could trigger imagination amongst the participants to envision desirable, near alternative futures. The target group for the game was business leaders with the aim of influencing organizational transformation.

2.3.2 Project Description, Methods, and Tools

The Hellon design team developed the design game through a participatory and iterative process in 2020-2021. The initial intention was to develop a physical board game based on that developed in CS2. However, due to the COVID19 pandemic and its consequences, a digital version had to be developed. Therefore, the first design iteration focused on removing the mobility elements from the game logic in CS2 and transferring the game into Miro board to be facilitated as a digital experience. The first version of the game prototype was tested with the partner researchers from CreaTures Project, and improvement ideas were collected throughout the game session, such as the need to integrate more specific sustainability-related content in the process.
Throughout Autumn 2020, the game design was iterated five additional times by the team and tested in four sessions to develop the content further with relevant stakeholders. These stakeholders included sustainability experts and professionals, system designers, service designers, and business leaders to bring in different perspectives to co-develop and improve the game. Each session was accompanied by researchers to observe and collect data from the session for the purpose of the CreaTures Project research goals. After each game session, Hellon's design team reflected on the insights received from observing and collecting feedback from the participants, and based on these insights, revised the game

logic and elements. These improvements included different topics such as integrating UN SDGs in the game logic, adding visual prompts to the beginning of the game, improving the visual representation of the game flow, and preparing an introductory presentation to prepare the players with the right "mindset" *(See Figure 6)*.

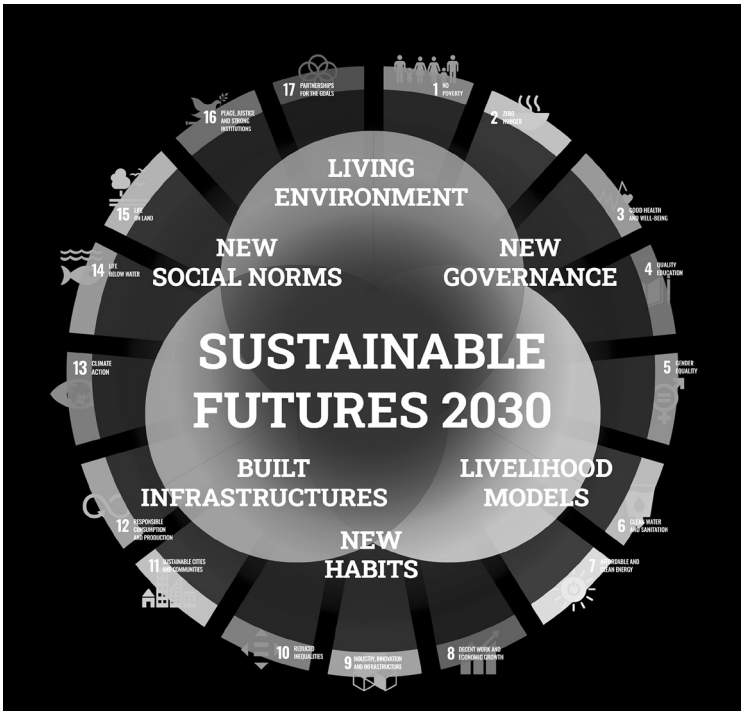

Figure 6. Sustainable Futures Game integrates UN SDG's as a framework, to guide players to talk about the future and write fictional stories around how these goals may have been achieved in 2030 (Illustration source: Hellon).

The final version of the game was tested in November 2020 in a business event with the target core audience –business sustainability professionals. In 2021, two additional online sessions were organized with the intention to apply the game in different contexts to explore the potential impact of the game without changing its rules, logic, and game elements.

2.3.3. Outputs and Outcomes

The final output of the project, the Sustainability Futures Game (Hellon, 2021), is a tool for organizations to imagine and reflect upon desirable sustainability futures. The game can be played by 8-10 persons at a time either through an online session or a physical workshop. The game session starts with an introductory presentation by the facilitators to prepare the players for the right mindset and introduce the key terms and concepts of the game. In the first part, the players collectively write a fictional story, which depicts a desirable near future for a selected city. The fictional story evolves through several collective tasks including, for instance, visual probes, probing questions, and questions related to the UN Sustainable Development goals (United Nations, 2016). The main objective of this part is to facilitate a dialog on desirable futures and collectively imagine a fictional story that integrates multifaceted characteristics of this future narrative, such as personal desires, societal norms, or political structures. In the second part of the game the players identify critical challenges and barriers that restrict or hinder their co-narrated desirable futures from materializing. Finally, the game session results in concrete, action-oriented suggestions on what type of activities should be implemented today to overcome the identified barriers and move towards the co-imagined future.

Based on the collected participant feedback, the game created a playful atmosphere and provided an inspirational method to practice imagination *(See Figure 7)*.

Figure 7. Hellon Team Playing the Sustainability Futures Game (2020) (Photo: Lotta Julkunen; Copyright: Hellon).

3. Discussion

In this section we reflect on the three case studies and share our insights about DfST practice using two lenses. First, we look at the studies as openings for creating conditions for design-led and participatory future-making in DfST. Second, we discuss the enablers for design consultancies to practice DfST as experienced by Hellon in the context of the case studies.

3.1. Facilitating Dialogue for Creating and Discussing Alternative Futures

All the case studies, although from different starting points, aimed at facilitating co-creation of alternative futures to address wicked problems through transdisciplinary and professional collaboration. The key objective in all case studies was to create frameworks, processes, or tools for generating dialogue on the topic of each project, creating future scenarios, and providing recommendations for the commissioning client. As examined below, in CS1, a sprint model and workflow with individual steps was designed, while in CS2 and CS3, games were designed to guide the participants to collaboratively create future scenarios. Secondary objectives were to enable the exchange of knowledge between participants and enhance collaboration and partnerships across relevant innovation and policy agents.

Our data analysis suggested that the ways of working enabled by design-led approaches (which were new to most of the participants) and imagining alternative futures through participatory methods were well received. More specifically, the participant feedback collected following the three sprints and the interview with the client representative from the PMO indicated that the sprint was seen as time-efficient, especially considering the high profiles of the participants. Further, evidence also suggested that the sprints contributed in bridging perspectives across cross-ministerial debates, and therefore provided concrete value for the participants. According to one participant, "the approach lowered the barriers between different ministries, which was definitely the best thing in the sprint. We got to the point instead of arguing." Another participant indicated that the iterative process embedded in the design sprint model helped her sharpen her argumentation for suggestions to the report. Meanwhile, some participants expressed that they valued getting to know their colleagues in other ministries and exchanging thoughts with other experts from different professional backgrounds.

The Nordic Urban Mobility 2050–Futures Game was played in multiple events including conferences and events organized for Nordic municipalities. The game sessions created a lot of discussion among players and resulted in co-created future scenarios that can be used to initiate new or reflect on existing project ideas. One participant referred to the game as an engaging tool that let her deep dive into future-related questions and challenges –a feature she often feels is lacking in usual workshops and seminars. Another participant stated that "this was an inspirational approach to move beyond the short-term challenges at work and really creates space to think long term." Further, most participants enjoyed the co-creation of future scenarios and expressed that this could work as a plat-

form to facilitate relevant discussions on different strategies, policies, and actions to move towards these scenarios.
Based on discussions with the participants, playing the Sustainability Futures Game triggered their imagination in envisioning alternative futures and forming an understanding of the interdependencies of sustainability issues and the long-term consequences of actions. One participant working in the municipality expressed that they do not have this type of in-house methodologies for thinking more holistically about mobility futures. Furthermore, based on observations during the game sessions, we learned that the game helps to facilitate a dialogue and collaborative imagining around desirable futures amongst participants from transdisciplinary backgrounds.
However, even though the design experiments facilitated dialogue, it should be noted that our designs for imagining sustainable futures had its limitations such as the time restriction of the game process that was acceptable for the participants or the restrictions in terms of the number and profile of participants who were willing to join. Yet, these novel collaboration models seemed to be a good fit to respond to rapidly changing circumstances in our societies and challenge siloed expertise and formal institutional cooperation models.

3.2. Visual Artefacts Building an Easier Entry Point for Complex Systemic Issues

The three case studies were building upon existing design methodologies as well as co-creation and co-design traditions (see Sanders & Stappers, 2008) in the context of long-term societal challenges that are complex by nature. When analyzing these studies, we identified that the design artefacts that were created and utilized during them bring value and contribute to the conditions driving sustainability transitions.
Moreover, all the case studies produced gamified processes that were facilitated with the help of designed artefacts. In CS1, the sprints were facilitated with the carefully crafted posters and templates that built on each other and created a red thread for the participants throughout the whole experience. Additionally, the sprint utilized elements such as the representations and illustrations of individuals like personas (fictional characters from the futures) or snippets from video interviews with citizens.
Meanwhile, the CS2 design included a game board and elements such as "Base world cards" –short story depictions of one plausible future according to the selected uncertainties, which helped with the ambiguity of yet nonexistent futures and offered a concrete starting point. On the other hand, in CS3, the game sessions started with visual prompts that participants selected from to start co-imagining a desirable future story. These visual artifacts enabled an easier entry point for working with complex systemic issues with a long-term focus, especially for the participants from various backgrounds who were not familiar with scenario building or future studies. Additionally, these artifacts aided participants in changing perspectives from one industry or company point of view towards more systemic societal perspectives, thus highlighting the interconnectedness and complexity of issues.
According to participants, most of the design artefacts utilized in the case studies enabled collaborative activities that resulted in more positive experience compared to the tradi-

tional seminars, where the audience would take a more passive role. Participants enjoyed being activated throughout the workshops.
Further, the visuals used in the games created eye-catching communication material and captured the curiosity and interest of the stakeholders. According to the client in CS2, the Nordic Urban Mobility 2050– Futures Game convinced some of their stakeholders to participate in the workshop. In this context, he stated that "Design game is like the celebrity for whom everybody wants to go to a party."
Based on these observations, we argue that visual and playful artefacts, coming from the design discipline in the transitions context can play a role in triggering the imagination and activating the engagement of participants as well as helping in opening their minds to new ways of working together. This mindset shift was a critical enabler for challenging existing paradigms and practices prevailing among the participants, enabling collaborative envisioning of systemic futures.

3.3. Enablers for Design Consultancies to Adopt DfST Practices

DfST is becoming a focus of interest and popular among design scholars and practitioners. However, as also explained in the Introduction, there are barriers for design agencies to operate within the context of transition projects that aim for systemic transformations at societal level. Therefore, we think it is important to identify the factors that enabled Hellon to take part in the projects explained in the three case studies. Based on our reflections, there are three key factors that enabled them to get involved in these projects within a commercial design consultancy context.
First, in all the case studies, interests, networks, and competences of one or more of the individual designers in the company influenced the emergence of the opportunity rather than a company-wide strategic outlook. These individual designers actively sought project opportunities to contribute to collaborative making of sustainable futures. Furthermore, these individuals actively educated themselves on the topic and searched for new methods, tools, and approaches to apply in practical project work. Thus, it can be argued that individual designers' efforts played a key role in enabling these projects to emerge. However, these individuals would not have had the opportunity to pursue their interests without a company culture that allows and encourages bottom-up innovation as well as service offerings and references to convince clients on the quality of the work. These factors created the conditions for individuals to pursue projects that were not in the common portfolio. To conclude, the initiatives were mainly acquired by individuals but supported by an organizational culture that created space for conceiving and pursuing projects rising from individual interest.
Another key factor for enabling these project opportunities was academic-practitioner collaborations. In all the case studies, academic methods, tools, and theory were applied in the practical project work either through direct collaboration with academic researchers (CS2 and CS3) or through applying theories and methods resulting from academic work in practice (CS1). Besides influencing the content, tools, and methods of the projects, it can be argued that academic involvement increased trust and interest amongst client

organizations to invest in them. Furthermore, the more deeply researchers were involved in the project, the more systematically the potential impact of the project was studied. On the other hand, practitioners' involvement helped to connect academic theories to clients' objectives and context, thus enabling the project opportunity to emerge. Consequently, as several other studies indicate (e.g., Amabile *et al.*, 2001), it can be argued that bringing together academic and practical expertise is an important enabler for diffusion of knowledge in society, which is especially crucial for addressing complex societal challenges.
The third factor that enabled the team to expand the project focus from the traditional service portfolio towards new experimental methods was open-ended project briefs. Compared to traditional, often rigidly structured briefs, these project briefs enabled space for the team to explore and test out new methods. In CS1, the explorative approach was enabled by the client, who was willing to try out new working methods, partly due to the Finnish government's pilot studies for encouraging experimentation (see Kokeileva Suomi, n.d.). Additionally, in CS2, the space for exploration was enabled by the client, who agreed to change the project output from conventional foresight analysis towards a more collaborative, playful, and explorative method. However, in CS3, it was mainly the EU Horizon 2020 funding model that enabled the design team to explore potential directions for a creative agency to address societal transformations.

3.4. Reflections on the Impact of Design-led Approaches in Sustainability Transition Processes

The projects presented in the three case studies cannot be considered full-scale transition projects as they lacked the breadth of systemic change targeted, depth of the systematic approaches used, and the longer-term project time frames associated with transition projects. However, all the three case studies dealt with long-term, systemic sustainability transformations and could be considered as activities aiming to bring together and mobilize transition actors, which take place before or in early phases of larger-scale and longer-term transition projects. In all the case studies, theories, models, and methods from sustainability transitions and transformations were used and adapted to designerly ways of knowing and doing. In our experience, applying such approaches to tools and methods commonly used in transitions and transformations –such as knowledge co-creation and foresight tools and methods– could enhance already existing tools and methods by making them more accessible to a range of participants including innovation intermediaries, businesses, and policymakers. This is an important observation particularly because there is an urgent need for accelerating transitions, and such easy entry points into the complex tools and methods could create a difference in bringing all transition actors on board.
Moreover, Gaziulusoy and Ryan (2017) observed that design can play several roles across all transition activities including roles that are not traditionally acknowledged as design roles. Among the roles identified by these authors, we observed the following in the case studies: assisting with analysis and synthesis of different knowledge forms in vision development; facilitation of participatory inquiry and deliberation; visual communication of alternative futures; formulation of scenario prototypes pre-negotiated with the stakehold-

ers; human-centric inquiry iteration; prototyping and experimentation; and dealing with uncertainty and complexity. While some of these roles can be and are played by different knowledge domains contributing to transitions, further systematic studies are needed on whether the ways design contributes is unique or not and if so, in what ways. In this context, the case studies we provided in this article provided suggestive evidence that design may be contributing in unique ways, such as providing easy entry of some actors into transitions related discussions, but due to the lack of comparative ground, it is not possible to argue with a stronger position on this matter. Further, we understand that the intersections between design and sustainability transitions/transformations also require some rethinking in design theory, which will hopefully emerge as empirical evidence accumulates.

A key relevant consideration relates to evaluation of impact. In commercial design consultancy contexts, projects are budget and time bound, and the continuation of the potential of the project is not always realized. In addition, although feedback is collected from commissioning parties and participants, this is not done systematically or rigorously in alignment with particular theoretical frameworks, hypotheses, or research questions as is the case in evaluations undertaken following academic standards. This creates a critical dilemma: to evaluate the impact of design in transition contexts, there is a need for design practice involvement, however unless impact evaluations are systematically undertaken, it is not going to be possible for truly understanding the impact of design. Therefore, the involvement of design practice in transitions projects may be hindered due to the lack of clarity about its impact. One emerging way to address this dilemma is establishing academic-practice partnerships as funding opportunities as such projects are promising under the European Green Deal and Horizon Europe programs. This was the situation in CS3. More specifically, while CS1 and CS2 were more traditional client projects that started without a research intention, CS3 has a systematic data collection process in place as it is part of a large, EU-funded consortium project. Here, the analysis of the evaluation processes is still ongoing and will be reported in research publications in the near future.

4. Conclusions

DfST is an evolving area of sustainable design research and practice that is increasingly becoming a focus among design scholars and practitioners. Design is capable of playing multiple roles in sustainability transitions, however both design scholarship and design practice has not been sufficiently acknowledged as relevant and useful in transitions research. In this article, we first shared our perspectives on the current challenges associated with practicing DfST in commercial design consultancy settings. Then, we presented three relevant case studies from a design consulting practice, Hellon, and described how the case study projects were acquired by the consultancy and what outcomes and outputs generated in these projects. Subsequently, we studied these case studies in order to reflect on the contributions and impact of design-led approaches in transition-like contexts and enablers of undertaking DfST projects within the currently limiting environment of commercial design consulting practices.

We found that design-led approaches in the case study projects facilitated collaborative imagining of desirable futures among multiple stakeholders and that the visual artefacts created as part of the projects have provided easy entry for participants into the complexity of systemic change processes. Individual designers taking the incentive to actively pursue projects in which DfST could be practiced and organizational environments creating allowances for bottom-up innovations in consulting service offerings have been identified as key enablers along with academic collaboration. Additionally, we also highlighted the importance of academic collaboration in understanding the impact of design practice in transition contexts. However, our findings should be taken as suggestive evidence rather than empirical validation for which there is a need for more systematic involvement of design practice in transition projects and systematic and rigorous evaluations of these involvements.

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Resumen: El diseño de transición o diseño para transiciones de sostenibilidad se reconoce como un área emergente de investigación y práctica de diseño. Aunque se estudió y practicó como parte de consorcios de investigación durante un tiempo, el diseño para transiciones ha comenzado a ser adoptado recientemente por profesionales y consultoras de diseño con solo unos pocos ejemplos en todo el mundo. Hellon, una consultora de diseño con sede en Finlandia y el Reino Unido, ha estado buscando activamente implementar ideas de diseño para transiciones y se ha involucrado con éxito en una serie de proyectos relevantes durante 2017–2021. Estos proyectos incluyen ayudar a la Oficina del Primer Ministro de Finlandia a consolidar un informe de sostenibilidad con aportes co-creados de todos los ministerios finlandeses, diseñando "Nordic Urban Mobility 2050 -Futures Game": un proceso gamificado para facilitar las transiciones de movilidad a las partes interesadas para co-crear escenarios futuros de movilidad –y el desarrollo de "Sustainable Futures Game"– un proceso gamificado para ayudar a las empresas a co-imaginar escenarios de futuro cercano alternativos deseables en alineación con la ambición intergubernamental de alcanzar los Objetivos de Desarrollo Sostenible. En este artículo, como equipo transdisciplinario de tres profesionales del diseño y un investigador, presentamos estos ejemplos como estudios de casos y compartimos reflexiones y puntos de vista críticos sobre los facilitadores, desafíos y oportunidades para implementar el diseño para las transiciones de sostenibilidad en la práctica y brindamos evidencia sugerente para las contribuciones de los enfoques dirigidos por el diseño en contextos de transición. En el estudio de caso, el diseño de los proyectos facilitó la imaginación colaborativa de futuros deseables y los artefactos visuales creados facilitaron el acceso de los participantes a la complejidad de los procesos de cambio sistémico. Al final, los diseñadores individuales que se incentivan en la búsqueda activa de proyectos y permiten entornos organizacionales, así como la colaboración con socios académicos, se han identificado como facilitadores clave para emprender DfST en contextos de práctica de consultoría de diseño comercial.

Palabras clave: Diseño sostenible - Diseño de transición - Diseño para transiciones de sostenibilidad - Codiseño - Práctica de diseño - Agencia de diseño - Estudio de caso - Finlandia

Resumo: O design de transição ou design para transições de sustentabilidade é reconhecido como uma área emergente de pesquisa e prática de design. Embora estudado e praticado como parte de consórcios de pesquisa por um tempo, o design para transições só recentemente começou a ser adotado por profissionais e consultorias de design com apenas alguns exemplos em todo o mundo. A Hellon, uma consultoria de design com sede na Finlândia e no Reino Unido, tem procurado ativamente a implementação de ideias de

design para transições e esteve envolvida com sucesso em um conjunto de projetos relevantes durante 2017-2021. Esses projetos incluem ajudar o Gabinete do Primeiro Ministro da Finlândia a consolidar um relatório de sustentabilidade com contribuições co-criadas de todos os ministérios finlandeses, projetando "Mobilidade Urbana Nórdica 2050 –Jogo do Futuro"– um processo gamificado para facilitar as transições de mobilidade das partes interessadas para co-criar futuros de mobilidade cenários –e desenvolvendo o "Jogo de Futuros Sustentáveis"– um processo gamificado para ajudar as empresas a co-imaginar cenários alternativos desejáveis no futuro próximo em alinhamento com a ambição intergovernamental de alcançar os Objetivos de Desenvolvimento Sustentável. Neste artigo, como uma equipe transdisciplinar de três profissionais de design e um pesquisador, apresentamos esses exemplos como estudos de caso e compartilhamos reflexões e insights críticos sobre facilitadores, desafios e oportunidades para implementar o design para transições de sustentabilidade na prática e fornecer evidências sugestivas para a contribuições de abordagens orientadas pelo design em contextos de transição. No estudo de caso, o design dos projetos facilitou a imaginação colaborativa de futuros desejáveis e os artefatos visuais criados facilitaram a entrada dos participantes na complexidade dos processos de mudança sistêmica. No final, os designers individuais incentivados a buscar ativamente projetos e permitir ambientes organizacionais, bem como colaborar com parceiros acadêmicos, foram identificados como os principais facilitadores da realização de DfST em contextos de prática de consultoria de design comercial.

Palavras-chave: Design sustentável - Design de transição - Design para transições de sustentabilidade -Co-design - Prática de design - Agência de design - Estudo de caso - Finlândia