Ömer Taha Döver

Enhancing Sustainability in the Design Process through Tactical Sustainability Cards

MSc. Strategic Product Design
Industrial Design Engineering

Delft University of Technology
July 2024

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Chair: Dr. Giulia Calabretta

Mentor: Dr. Shahrokh Nikou

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Master's Thesis

PREFACE

In the next one hundred-or-so pages you will read about designers engaging with sustainability in their professional practices and how my design intervention "Tactical Sustainability Cards" enhances this engagement. Observing designers burdened with the responsibility and expectations of the almost unattainable sustainable innovation, I felt for my fellow designers. I set out to investigate what happens behind-the-scenes and how to turn their hardships into contentment. This body of work is a manifestation of me channelling my frustration and dissatisfaction into something constructive and beneficial.

While the finished product fits neatly into these limited number of pages, the amount of research, preparation, and organisation that went into this thesis goes beyond. I would not have been able to do so without the constant and genuine support of some wonderful people. Late at night or early in the morning, the presence of my friends and family was always felt and I am infinitely grateful to have you in my life. My dear supervisors Dr. Giulia Calabretta and Dr. Shahrokh Nikou, thank you for believing in this project and believing in me, your guidance and encouragement propelled this thesis to new heights. Special thanks to all the interview participants who spared their much valuable time as well as all session participants who proactively contributed. Lastly I would like to thank the Foundation Justus & Louise van Effen and TU Delft for recognising promising students from around the world and financially supporting them in their academic ambitions, your efforts provided me with the opportunity to earn this degree. With all this great support, I am concluding my master's education and presenting to you my thesis.

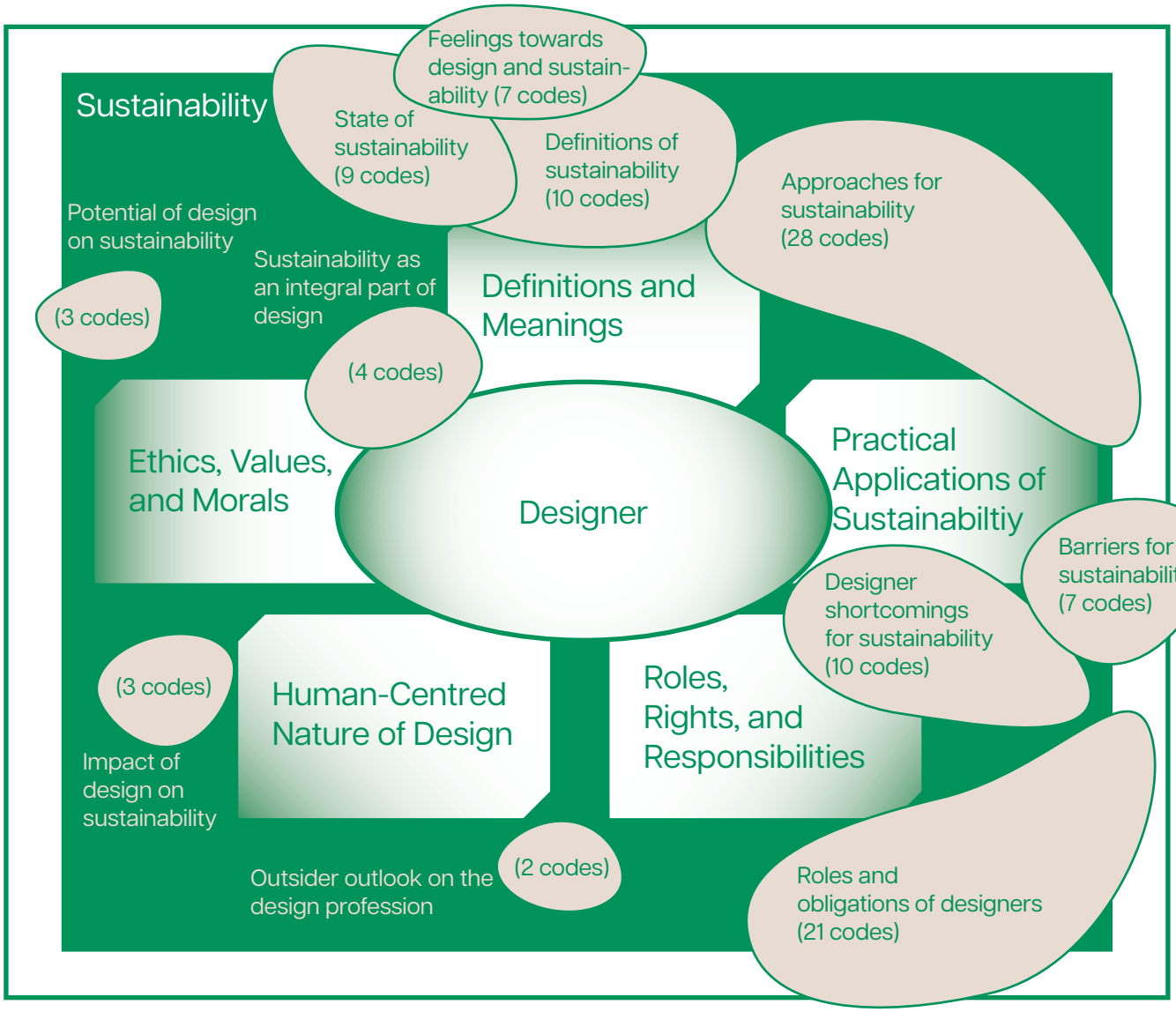
Please enjoy.

Ömer Taha Döver

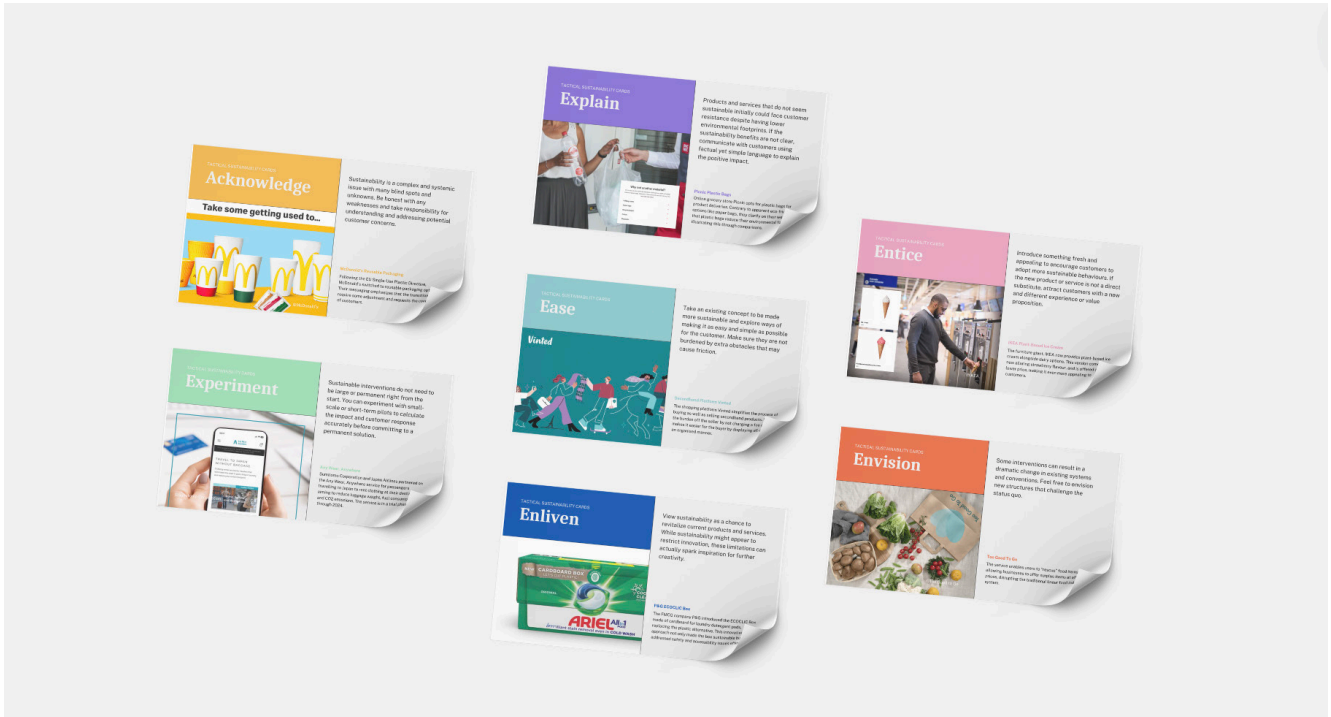
Ryan Searle
Bridgwater, England, United Kingdom
2017

EXECUTIVE SUMMARY

Designers engage with sustainability in their professional practices in a variety of ways. They resort to Design for Sustainability (DfS) approaches, even though they tend to rely on intuition rather than theoretical works. They possess the ability to lead users to individual behaviour change through interventions. They have certain methods and capabilities to transform sustainability challenges into actionable and potentially sustainable futures, and certain shortcomings in skills and education as well as the challenges they face such as workplace conditions and policies which results in them prioritising other factors over sustainability. Given that, there exists a gap in the literature where the point of view on sustainability of professional designers is not adequately taken into account. Through a series of interviews based on a conceptual framework, this thesis aims to qualitatively study and understand the subjective perspective of professional designers on how they conceptualise and assess sustainability in order to detect opportunities to develop new and improved tools, methods, and approaches. Based on the interviews, designers are found to be not the decision makers around sustainability issues and they need to speak the business language to contribute to decision making. They could furthermore advocate by asking the right questions to the right people at the right time. Having said that, it is important to highlight that not everyone is passionate for sustainability and designers may be alone in their battle. Their challenge is to design solutions where user-centricity comes first and are still profitable for them to be effective. One skill of designers is that they could bring awareness via tangible ways, which is especially important for an issue as abstract as sustainability. Implications for designers is that they could look at examples for inspiration, but need to go beyond and nudging the customer is not enough, the product needs to have inherent sustainable qualities. Ultimately, sustainability is a complex, systemic issue yet design interventions are not yet holistic or integral. Through a co-creation session, the problem statement was defined based on the findings from the literature review and interviews. Stemming from a deeper need for guidance and direction, designers need inspiration to imagine new paths of navigating sustainability issues. They face challenges with advocacy for sustainability and the fight against greenwashing in their organisations. They need ways of justifying their actions to managers by proving their actions with credible references and need to align and empower stakeholders with different backgrounds on sustainability issues by engaging them through compelling and accessible ways and effectively communicating with them through a common language. In response to this statement, the design intervention Tactical Sustainability Cards was developed. This tool helps the designer at hand by giving them tactics when trying to balance innovation and sustainability in the design process. They furthermore show examples from the industry to benchmark and get inspired. Additionally, they provide relevant academic sources for designers to strengthen their design work. These cards were validated through interview participant feedback and a validation session, and a final iteration is presented.



Subcodes generated from the interviews mapped on the conceptual framework.



Tactical Sustainability Cards

TABLE OF CONTENTS

Johny Goerend
Mamer, Luxembourg District, Luxembourg
2017

INTRODUCTION

Against a backdrop of global warming and environmental pollution, companies are finding themselves re-evaluating ways of dealing with competition and stakeholder values (Aschehoug & Boks, 2011). Sustainability has become one of the quintessential factors for these companies, which are nudged to incorporate environmental, social, and economic performance criteria as baseline product design requirements (Fargnoli et al., 2014).

The response to sustainability issues from the design field, on the other hand, can be broadly categorised as Design for Sustainability (DfS) (Ceschin & Gaziulusoy, 2016). As the influence of the design field and subsequently the design practitioners on society increases (Jung & Mejía, 2023), the field proposes and disseminates new interventions (Baldassarre et al., 2024). These interventions cover approaches such as eco-design and product-service systems, as well as the many instances of working towards, by design practitioners, the sustainable development goals proposed by the United Nations to further drive DfS (Bhamra & Hernandez, 2021).

Additionally, a subject of growing interest in the design community has been user behaviour change leading to being more sustainable and ecologically conscious (Grosse-Hering et al., 2013). This behaviour change subject is on the agendas of not only design practitioners but also governmental figures (Gonzalez-Arcos et al., 2021). Although rarely mentioned in relevant contexts, the design field can help create behaviour change and spread related information for more sustainable living, reforming universal consumption trends and environmental deterioration (Emans & Murdoch-Kitt, 2018). However, this unearths a plethora of ethical issues for the designer as they need to explore the possibilities of design for sustainable behaviour that does not compromise personal freedoms, dignity, privacy, and liberty (Mehellou et al., 2023). Another area designers can make an impact is the use phase of a product (Efkolidis et al., 2019) which has received less attention compared to manufacturing and disposal (Lilley & Wilson, 2013). With certain product categories, for instance, user interaction has significant environmental impact and by focusing on this user behaviour, design practitioners can promote more sustainable use habits.

There is also criticism of sustainability for the sake of sustainability, which oftentimes overlooks the unwanted implications for certain vulnerable groups and overall lacks depth in discussions (Jenks & Obringer, 2020). It is worth mentioning that critical thinking skills are paramount for sustainability. To establish these skills in design practitioners, critical or otherwise, first, it is needed to understand the relationship between designers and sustainability. Research needs to comprehend how design practitioners engage with sustainability approaches to further improve upon them (Mejía et al., 2022), which is partly the research goal of this project.

The term “design practitioner” is used repeatedly and interchangeably with “designer” in this thesis, which not only refers to professional designers but also to adjacent roles such as innovation and product

management that act as de-facto designers (Mejía et al., 2022). This is to characterise the action of designing and not necessarily the profession of design.

This thesis sets out to investigate the research question: How do design practitioners engage with sustainability in their professional practices? In other words, it characterises the engagement design practitioners have with sustainability as, although literature outlines the DfS tools and methods, the interaction between design practitioners and these approaches is seldom investigated with limited understanding of how designers utilise them. More research is needed on comprehending the point of view on sustainability of design practitioners. Prior research focuses on reviews of existing tools, methods, and approaches design practitioners refer to but does not offer an in-depth look into how they define and comprehend sustainability in the first place. The interactions of the stakeholders regarding sustainability issues and their relationship to the design practitioner is also not adequately investigated. A more holistic understanding of the intersection between design and sustainability is needed. The thesis aims to qualitatively study and understand the subjective perspective of design practitioners on how they conceptualise and assess sustainability in order to detect opportunities to develop new and improved tools, methods, and approaches. By focusing on those employed at companies in the Netherlands, it seeks to evaluate the designers' readiness to address sustainability issues including their capacity to interact with other stakeholders. Furthermore this research aims to triangulate existing findings with a qualitative research methodology and contributes to amplifying the personal voice of the designer within design literature. Additionally, it is worth mentioning that there is a lack of actionable implications for design practitioners in the literature and the existing limited work is not realistic/practical but more idealistic/theoretical. Actionable implications are needed to bring awareness to and target sustainability issues in organisational settings but also in society overall.

This thesis is structured as follows: Part 1: Research, comprises a literature review and a qualitative study with design practitioners. The results of this part lay the groundwork for understanding this controversial conundrum, outlining how sustainability and design co-evolved over time. It touches upon the roles and responsibilities of design practitioners while providing an informed look into their attitudes and values around sustainability. It sets out to detect the tools and methods designers use, investigate the power dynamics in organisational settings around sustainability, explore the definitions of sustainability, and assess how designers position design, sustainability, and human-centricity. It further delves into dilemmas of advocacy, and informs about the qualities designers self-critique on improvement. Part 2: Design, is an exploration into the intervention space building on the insights from the previous part. Here, a design concept that aims to facilitate and improve the engagement between sustainability and design practitioners is presented. This part of the thesis includes additional details about the ideation tools and methods used during the design process, including a co-creation session and a validation session.

Part 1: Resear

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The approach is through a literature review and an interview study.

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heir professional practices?”

1.1 LITERATURE REVIEW

“There are professions more harmful than industrial design, but only a very few of them.” (Papanek, 1985)

1.1.1 INTRODUCTION

In 1987, the UN Commission on Environment and Development published a report, titled “Our Common Future” (commonly known as the “Brundtland Report”), defining sustainable development as such that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (UN, 1987). This report is known to lay the groundwork for many companies’ sustainability efforts (Frecè & Harder, 2018). More recently, in 2015, the international community adopted the 2030 Agenda for Sustainable Development, containing 17 Sustainable Development Goals (SDGs), amongst which are "climate action, clean water and sanitation, and sustainable cities and communities” categorised under topics such as "biodiversity and ecosystems, chemicals and waste, and climate action and synergies" (UN, 2015). Economic and environmental viability and social acceptance are paramount for a company to function sustainably; for companies to plan their sustainability strategies, the SDGs present a wide range of goals and actions (Fleming et al., 2017). These critical documents outline sustainable development as a framework that balances current necessities with the conservation of resources for coming generations, highlighting crucial goals and topics within the context of global sustainability.

Today, we are standing here with an agenda composed of defined goals and targets for less than ten years into the future which acts as a reference point for the transition to sustainable development (Weiland et al., 2021). What does this entail for individuals, governments and companies? Sustainable behaviour, for instance, is promoted by governments for individuals through interventions (Gonzalez-Arcos et al., 2021). For companies, there is a call to utilise their inventive and creative skills to address sustainable development issues (UN, 2015). Despite the multiple models developed to adjust individual behaviours, their effectiveness in driving significant change is restricted (Whitmarsh et al., 2021). Furthermore, findings suggest that companies face challenges in enhancing their positive impacts on society and the environment (van Zanten & van Tulder, 2021). Individuals, governments, and companies alike are nudged to adopt sustainable behaviours and leverage their capacities to respond to environmental and societal issues as well as the agenda set by the UN. With all this given, significant barriers and challenges remain in achieving positive change.

1.1.2 METHODS

The research question was initially addressed with a literature review. The aim was to understand the current literature, define the research gap and goal before collecting data from practising designers. The search engine Google Scholar was selected

as the main research tool since it has a wide variety of scholarly articles and facilitates accessing them. The search term (design* AND sustainab*) was initially chosen to capture a broad range of articles related to design and sustainability. To refine the research, “behaviour change” and “ethics” with the AND Boolean operator were further added. The limiting criteria were selected as follows: the articles need to be from scholarly journals/books, must be in English, must be published after 2000, and must be accessible to the researcher. The time period was selected as such since these papers provide more relevant and current insights, furthermore, the main wave of design approaches development happened through the 2000s (Ceschin & Gaziulusoy, 2016).

1.1.3 RESULTS & ANALYSIS

In total, after initial screenings and exclusions, 42 papers, 2 reports, and 4 books were examined. The papers range from 2003 to 2024. See Figure 1 for a visual representation of the review. The findings are presented below.

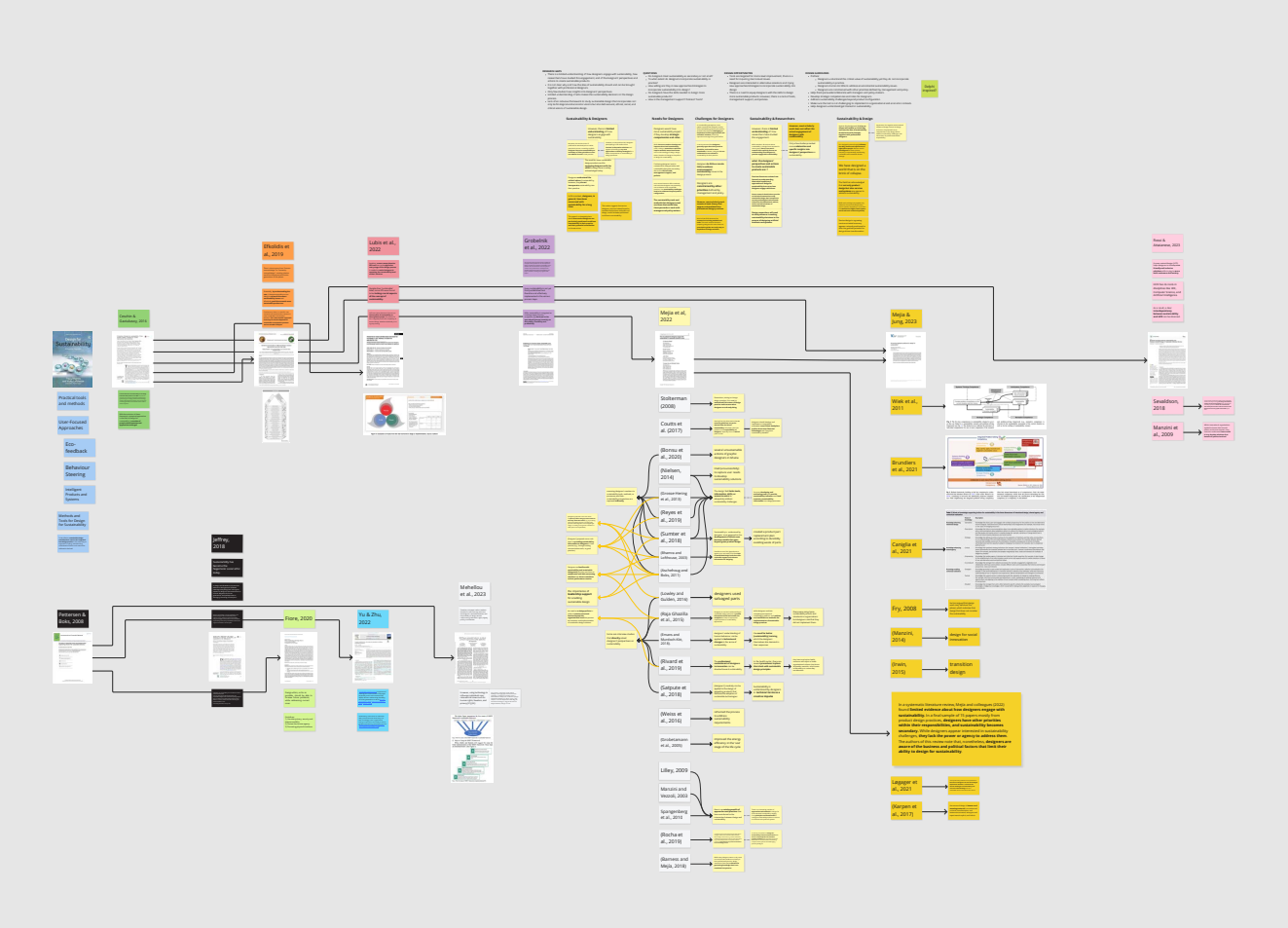


Figure 1: The literature review findings and connections

1.1.3.1 Designers prioritise other factors over sustainability

Contrary to the likes of Papanek (1985), contemporary researchers express their belief in the potential of design and designers as enablers of sustainable development (Thatcher, 2012). However, this does not necessarily mean that sustainability is primary in the designer's agenda, in fact, research paints a more grim picture. Mejía and colleagues (2022) refer to this by stating that designers may consider sustainability in their practice as a second priority or not even one at all, even though they understand its vital value. Similarly, research on the designers of a multinational engineering and technology company shows that while sustainability is acknowledged as a strategic aspect, the emphasis is on the desirability, feasibility, and profitability of the operational process (Grobelnik et al., 2022). Despite conflicting views on design in the context of sustainability, one common finding in the literature is that designers often prioritise other factors over sustainability, which may slow the advancement in sustainable development.

1.1.3.2 Designers have certain roles and responsibilities around sustainability

In their viewpoint, Jung and Mejía (2023) highlight the positioning of designers, specifically service designers, to respond in their practice to sustainability and contribute to climate action (Jung & Mejía, 2023). They clarify by saying these designers not only work on products but also services and systems to address sustainability. They argue that in an economy that is dominated by services, the influence of these designs can reach higher levels of innovation including socio-technical systems. Service designers are claimed to possess the foresight exploration methods to transform the wicked challenges of sustainability into tangible interpretations of potentially sustainable futures. Service or otherwise, designers comprise the capabilities that could potentially help the progress of sustainable development.

Despite the previously mentioned secondary positioning of sustainability, designers are still willing and interested in trying alternative solutions and approaches or developing strategies to better integrate sustainability into the design process (Mejía et al., 2022). This can potentially lead to better adoption of design practices that overall lead to more sustainable outcomes.

So far this thesis highlighted the inherent qualities of the designer that can contribute to sustainable development. It is also externally desired that a designer, even if their employer favours short-term monetary benefits over long-term sustainability benefits, conceives and enforces a sustainability direction (Coutts et al., 2017).

1.1.3.3 Designers have certain shortcomings

Designers possess the qualities and capabilities to help progress with sustainable development, yet, they also have certain shortcomings. The shortcomings may stem from within in terms of an adequate level of skills and education, but also from outside such as the workplace conditions and policies. Mejía and colleagues (2022) discuss that designers' hands are tied to address environmental sustainability matters in the design process and are restrained by other priorities determined by management and policy. They also mention that designers do

not comprehend or have the proper training for their practice and thus agree that their work could be more sustainable. Furthermore, the impact on sustainability could be increased if designers are given strategic competencies and positions. Lastly, they argue that there is a lack of tools (even if there is enough, it is challenging to implement in the organisational context), management support, policies, and leadership support for designers in their sustainability practices and that all these would help with enabling sustainable design.

Two examples of these shortcomings come from the health and manufacturing sectors. Sustainable design conventions contradict certain procedures in place in the health sector; the dedication to innovation of designers could be channelled towards sustainability but the designers are required to prioritise health effects and acclimate to practices that tend to use disposable materials (Rivard et al., 2020). Similarly, designers use their knowledge of sustainable design practices to supply information on improving the implementation of sustainability approaches internally and externally; while designers and the companies they work for have awareness of policies for sustainability, those policies are lacking to trigger the implementation of sustainable design practices. Even though in organisations there may be unconsolidated sustainability efforts, designers rarely implement them (Raja Ghazilla et al., 2015). These examples from two industries of healthcare and manufacturing show how certain sectors generally prioritise short-term concerns over long-term sustainability goals, creating barriers for designers to integrate sustainable practices into their work processes.

1.1.3.4 The role of human-centred design in promoting sustainability

The naturally human- and meaning-centred discipline of design (Karpen et al., 2017) can greatly influence the daily decisions of the human population; humanity is increasingly moving towards irreparable climate damage unless these decisions are taken with care (Kulsbjerg Løgager et al., 2021). Individual behaviour change can be accomplished via designer effort, as the acquaintance of designers with human behaviour can be capitalised on to enact behavioural changes, specifically in the context of sustainability (Emans & Murdoch-Kitt, 2018). Designers armed with their understanding of human behaviour, have the ability and potential to facilitate behaviour change to more sustainable ones to aid the battle against environmental deterioration.

Additionally, researchers have been inquiring about Human-Centred Design (HCD), with roots in Human Factors and Ergonomics (HFE), and its connection with sustainability. Some suggest an association between the two as HCD can aid designers with designs that are eco-friendly and inclusive while benefiting both customers, society at large, and all parties involved (Rossi & Attaianese, 2023). Some point out that HCD can help with the “people'' element of sustainability as it is often overlooked (Lubis et al., 2022) while some argue incorporating sustainable design considerations into the design practice similar to other factors such as ergonomics (Bhamra & Lofthouse, 2008). Understanding the user (the “human” in HCD) can help designers educate the user on sustainability issues and nudge them towards more sustainable consumption, thus enacting the aforemen-

tioned behaviour change and the potential sociocultural transformation (Efkolidis et al., 2019). The interplay between HCD and sustainability can result in individual change and contribute to higher-level systemic transformations within society and culture.

1.1.3.5 Existing DfS approaches

This section summarises existing DfS approaches and outlines their advantages and shortcomings. Furthermore, a set of guidelines for designing new approaches and a directory of critical considerations are suggested.

With design positioned as the perpetrator of ecological and environmental crimes (Jung & Mejía, 2023; Papanek, 1985), a plethora of conceptual approaches and practical applications have emerged. Since the nineties, these approaches populated the design discourse, which could be categorised under the term "Design for Sustainability (DfS)," comprising product-adjacent concepts such as eco-design and later systems-related ones like Design for System Innovations and Transitions (Ceschin & Gaziulusoy, 2016). It is meaningful to highlight the atoning character of these approaches and make connections with the aforementioned offendant attitude towards design.

The DfS field, over time, moved from a product viewpoint to a more system-level transformation focus. It is possible to order the shift from a product innovation level to a socio-technical system one, with the product-service system and spatio-social innovation levels in between (Ceschin & Gaziulusoy, 2016). With the scope of design expanding at each level, a similar ordering can be made with approaches targeting the actual design process, followed by tactical mid-level evaluation processes to high-level strategy tools (Rocha et al., 2019). It could be argued that a general shift is present from discrete product design to strategic systems design. Yet, there is still to be explored at the product and service levels. This thesis mainly focuses on the product and product-service system innovation level as these levels can challenge the three aspects of customer behaviour, organisational structure, and regulations (Ceschin & Gaziulusoy, 2016). Designers at this level may have latent needs and barriers in engaging with sustainability issues, such as obtaining a systemic approach (Dewberry et al., 2013) and challenges with testing and implementing (Vezzoli et al., 2015). It is worth investigating the engagement of design and sustainability at this level, which could shine a light on insights for other levels of DfS as well.

Seminal work in this regard includes the likes of transition design (Irwin, 2015) and design for social innovation (Manzini, 2014), both striving to use design methods to address social issues and activate societal transitions. Furthermore, in their book "Design for Sustainability: A Practical Approach," Bhamra and Lofthouse (2008) list a selection of methods and tools for DfS and group them under the following headings: Environmental Assessment, Strategic Design, Idea Generation, User Centred Design, and Information Provision (Bhamra & Lofthouse, 2008). Special attention can be given to the heading UCD which comprises participant observation, user trials, product-in-use, and others. The reasoning behind including UCD techniques is that if designers get a better understanding of how users (mis)use a product, they can lower the negative impacts of said product. Given the publishing date of the book, it is expected to see techniques applied to the design process and the stages of product development.

More recent work focuses on DfS approaches that target the systemic and societal levels of innovation.

While these approaches are created to facilitate the efforts of the designer, they have also brought some criticism along. Despite being titled sustainable, some approaches turned out to not comprise the critical characteristics of the sustainability concept (Lubis et al., 2022). Furthermore, it is known that although designers have familiarity with sustainable approaches, they are regarded as complex and time-consuming and have limited contribution to their performance metrics (Aschehoug & Boks, 2011; Bhamra & Hernandez, 2021; Raja Ghazilla et al., 2015). Due to its perceived complexity, time-consuming quality, and trace level impact on performance metrics, designers face barriers in sustainable practice implementation. Furthermore, some so-called sustainable approaches receive backlash as they do not cover the significant aspects of sustainability.

1.1.3.6 Bridging the gap between theory and practise

Another point of criticism for these approaches is that the tools and methods seldom make the transition from theory to practice. Literature on this subject focuses on creating the stated methods and tools but this could be restricted as implementing prescribed guides in design activities is usually challenging and thus they remain in theory untranslated (Jung & Mejía, 2023). Furthermore, it is stated that in their practices, designers act intuitively in contrast to following theory or evidence so design researchers are criticised for perpetuating knowledge untranslated into practice (Barness & Mejía, 2018). As designers are prone to relying on intuitively making decisions instead of implementing guides, some point out that these approaches cannot connect theory and practice. Thus, reiterating a gap between theoretical knowledge and practical application in design.

1.1.3.7 Design opportunities for new approaches

This section highlights the drawbacks of existing design approaches and areas of potential novel approaches. One general reason for the designer's apprehension about sustainable design tools could be the lack of those that present actionable assistance and supply appropriate information for the design process (Bhamra & Lofthouse, 2003). Additionally, there is a need for a more comprehensive tool that can function at each step of the design process to help designers evaluate the sustainability rating of their design work (Lubis et al., 2022).

Some researchers lay the groundwork for new sustainable design approaches and refer to significant focus areas for the designer to be mindful of; the responsibility to be more sustainable, for instance, should be established as a shared one between the individual, company, and government (Luchs et al., 2015). Similarly, the designer should be careful not to blame the individual when trying to achieve a behaviour change (Evans, 2011). Additionally, with the introduction of or replacement with a new sustainable design product, the change in the quality of life should be something to consider (Steg & Vlek, 2009). One aspect that is often overlooked is the implications for marginalised communities and the designer should consider these unwanted effects; plastic bans, for instance, have dire consequences for disabled people who need single-use plastic products in their daily lives (Jenks & Obringer, 2020). Also, the eth-

ical implications of sustainable design are significant, with some researchers agreeing on an influence on the individual as long as their autonomy is not compromised (Lilley & Wilson, 2013). Mejía and colleagues (2022) point out that the tools are significant for assisting designers in convincing or collaborating with management and policy-makers. Furthermore, they argue that there is still a gap in sustainable design that overlooks the behavioural, ethical, social, and critical visions of sustainable design, not just technological and economic ones. Similarly, the tools should go beyond targeting product configuration and micro-level improvements, and reach macro-level issues such as ethics and politics of design.

Lastly, two concrete examples of how to design better approaches for sustainable design are as follows: designers suggest getting more information on sustainability through these tools or training (Aschehoug & Boks, 2011; Bhamra & Lofthouse, 2003; Grosse-Hering et al., 2013; Reyes et al., 2020) and prefer specific product design process solutions that for instance target involving the user, elongating product use cycle, and promoting repairability (Aschehoug & Boks, 2011; Lowley & Gulden, 2016; Sumter et al., 2018). To refer to the vast range of challenges and considerations within the field, more inclusive and multifaceted sustainable design tools are required to be developed.

1.1.3.8 Research gap

This study refers to the aforementioned "Brundtland Report" (UN, 1987) to define sustainability and sustainable development. It is important to mention that this definition is not comprehensive or definitive; the notion of sustainability is fluid and can be defined using different frameworks that focus on different aspects. What is more significant for this thesis is the relationship between design as a discipline and sustainability as a property that guides the actions of practitioners through each step of the product development process.

Given the extensive literature on DfS has a prominent focus on tools and methods, the understanding of how designers engage with sustainability in their practice is nevertheless limited. Designers have interacted with sustainability for a long while yet what precisely happens in that interaction is not adequately investigated (Jung & Mejía, 2023). In their systematic literature review paper on designer engagement with sustainability, Mejía and colleagues (2022) point out that only a handful of articles offer an astute look into designers's perspectives on sustainability. They further argue that prior literature focuses on comprehending the models and approaches of DfS but not on how designers utilise them. They suggest researchers grasp the character of the design discipline and what designers are doing in their practice initially to later alter the said practices. It is also present in their work that detecting the decision-makers when it comes to sustainability is also crucial to thoroughly understanding the engagement. They conclude by shedding light on designers' perspectives by referring to actions such as reframing the procedure to handle sustainability conditions and to the understanding of sustainability as an approach to develop novel holistic business models that go further than green product design.

1.1.4 CONCLUSION

In summary, review of existing literature underscores the relationship between

design and sustainability. The review navigates through various conceptual approaches and practical applications that have emerged within the design discipline. Referring to seminal works such as the Brundtland Report (UN, 1987) and Sustainable Development Goals agenda, the review explores the response to sustainability issues from individuals, governments, companies; as well as designers and design as a broader field. Design for Sustainability is taken as the main framework to explain the evolution of design's relationship with sustainability but also to highlight the research gap: more research is needed to deeply understand how professional designers define and comprehend sustainability, including their interactions with stakeholders, as current studies focus on tools and methods but lack a holistic view of the intersection between design and sustainability.

Although there exists conflicting views on design within the sustainability context, literature points to a common finding, which explains that designers often prioritise other factors over sustainability which may hinder sustainable development. Furthermore, literature shows that designers possess the ability to lead to individual behaviour change thanks to the understanding of human behaviour. This individual behaviour change can be the result of the interplay between HCD and sustainability which in turn can lead to high level societal systemic transformations. Additionally, the methods and capabilities of designers are argued to be beneficial in addressing sustainability issues by transforming sustainability challenges into actionable and potentially sustainable futures even though managerial pressures might prioritise short-term wins. However, literature shows that designers have certain shortcomings in skills and education as well as challenges they face such as workplace conditions and policies. The literature review also highlights existing DfS approaches by explaining their benefits, shortcomings, and the criticism they received on their effectiveness and level of impact. The review also highlights the gap between theory and practice as designers tend to rely on intuition rather than theoretical works. Lastly, existing approaches are highlighted with a focus on areas of improvement, emphasising actionable tools that support designers and address broader issues, which acts as a backbone to the design intervention presented in this project. This thesis qualitatively explores, to address the research gap in understanding designers' perspectives on sustainability, how designers conceptualise and assess sustainability to identify opportunities for developing new tools and methods, evaluate their readiness to address sustainability issues and stakeholder interactions, and amplify their personal voice within design literature by triangulating existing findings.

1.1.5 CONCEPTUAL FRAMEWORK

This thesis approaches the research question through a qualitative approach (i.e. an interview study) in five themes: Definitions and meanings, Practical applications of sustainability, Roles, rights, and responsibilities, Human-centred nature of design, and Ethics, values, and morals. These themes are derived from the literature review and refer to the research gap as they lead to a more holistic understanding of the intersection between design and sustainability. See Figure 2 (next spread) for a diagram of the framework.

Definitions and meanings refer to the many ways of describing sustainability and sustainable development. This theme focuses on how the designer defines sustainability as well as how it is defined organisation-wide; as inferred from the literature, it is given that there is value in investigating the reasoning behind which definitions are preferred. Practical applications of sustainability refer to the tools, methods, and approaches designers refer to when engaging with a sustainability issue. This theme defines them and reveals insights for future applications; literature hints that practical applications reflect the state of sustainability in a given context. Roles, rights, and responsibilities are in reference to the position of designer in the organisation within the context of other stakeholders. It outlines these elements and forms the connections between; it is given that the designer identity is changing and adapting to the state of sustainability. Human-centred nature of design takes on the lens of human-centricity and investigates approaches to sustainability through this lens. It further defines the value conflicts and alignments; literature shows the significance of human-centricity when it comes to reaching sustainable impact. Lastly, Ethics, values, and morals focus on the personal outlook designers have on sustainability. Specifically focusing on the human and societal applications of their practice, this theme is rooted in the opportunities for new design approaches presented in the literature.

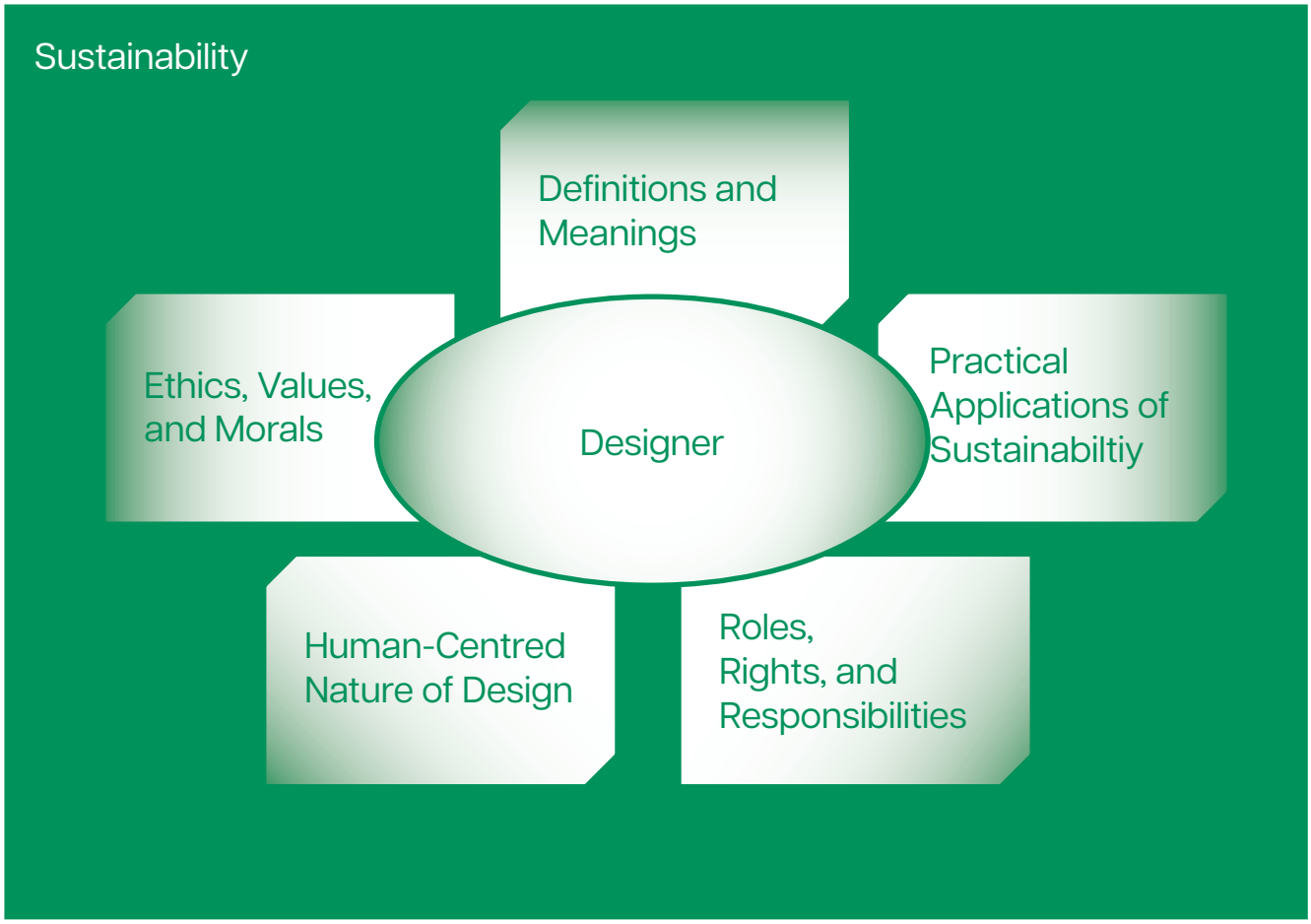


Figure 2: Conceptual framework

Max Böttinger
Baden-Württemberg, Germany
2017

1.2 INTERVIEWS

"People cut down trees not because people are evil; they do it when the incentives to cut down trees are stronger than the incentives to leave them alone." (Gates, 2021)

1.2.1 INTRODUCTION & METHODS

As Mejía and colleagues point out, there is a need for research on comprehending how designers address sustainability; the understanding of what designers think about and do for sustainability is limited even though prior literature has proposed tools, methods, and approaches for designers (Mejía et al., 2022). They also mention the need to focus on what designers do as it leads to developing other design strategies. Furthermore, they refer to their own research plans which include interviewing experienced design practitioners based in the United States. An interview study inspired by this call was organised to gain deeper insight into the subject matter, however, this time focusing on design practitioners based in the Netherlands as this region is not specifically or adequately studied. Appendix A is a visual representation of the interview preparation process, which includes the process of defining and finalising the interview guide. Semi-structured interviews based on this interview guide (see Appendix B) were utilised as they lead to compelling design directions. Participants were selected to fit the description of "design practitioners working in-house for companies in the Netherlands" and were reached out via "cold calling", social circle recruitment, and snowball sampling. Furthermore, business fairs were used as interview participant recruitment opportunities. In-house designers were preferred as they tend to have a more extended understanding of manufacturing and marketing at a given company compared to consultants (Bohemia, 2004), which allows for a more holistic investigation of the organisational contexts.

Online calendar invitations were sent to interview participants after deciding on a date and time via email. Before each interview, a reminder email was sent to the participants containing the Informed Consent Form (Appendix C) to be signed before the interview and delivered to the researcher, the contents of which were reminded again at the beginning of the interview.

The interviews were conducted both in person and online through a platform such as Zoom or Microsoft Teams between April and May, 2024. The sessions were recorded, automatically transcribed using secure software and anonymised. The interview transcripts were sent to each participant to get approval on advancement with analysis.

In total, twenty-four invitations were sent out and out of the twenty-four, eleven participants agreed to be interviewed. This thesis only analyses ten of the participants as one of them failed to approve the tran-

Table 1: Interview participants and their respective industry classifications

Participant Codes	*Industry*
Participant 1	Household Durables
Participant 2	Consumer Staples Distribution & Retail
Participant 3	Household Durables
Participant 4	Textiles, Apparel & Luxury Goods
Participant 5 (Transcript not approved)	Food Products
Participant 6	Household Durables
Participant 7	Marine Transportation
Participant 8	Banks
Participant 9	Leisure Products
Participant 10	Consumer Staples Distribution & Retail
Participant 11	Household Durables

script. The identities of participants are kept anonymous, however, industry information of the respective companies can be found in Table 1, according to the Global Industry Classification Standard (GICS).

1.2.2 RESULTS & ANALYSIS

After getting approval to advance with the transcripts, a thematic analysis was performed on the transcripts. Through a series of inductive coding, a code structure was established (Appendix D), the main codes of which can be found in Table 2. Figure 3 (next page) is a visual representation of the sub-codes mapped onto the conceptual framework; the size of the sub-code shapes correlates with the number of sub-codes. The placement of shapes explains the relation to the elements in the conceptual framework.

Table 2: Interview codes and their respective counts of sub-codes

Codes	*Number of sub-codes*
Approaches for sustainability	28
Roles and obligations of designers	21
Definitions of sustainability	10
Designer shortcomings for sustainability	10
State of sustainability	9
Barriers for sustainability	7
Feelings towards design and sustainability	7
Sustainability as an integral part of design	4
Impact of design on sustainability	3
Potential of design on sustainability	3
Outsider outlook on the design profession	2

Besides the thematic analysis, key quotes from the transcripts were selected. Quotes that have the potential to guide towards design directions were prioritised, see Appendix E for the selected quotes. Afterwards, these quotes were clustered under statements; actionable and provocative characteristics were prioritised for this clustering. See Appendix F for the quote clusters and statements. The main purpose behind the selection of quotes, clustering, and statement forming was to create insight cards. These cards comprise a provocative statement, a brief explanation, and supporting quotes (Figure 4). The cards were established as a medium to conceptualise the insights from the interviews and make them concrete to be used in the following steps of the project. Please refer to Appendix G for the remainder of the insight cards.

The next section outlines each insight card and by doing so, characterises the main insights of the interviews. The sections are divided per statement and each statement refers to one insight card.

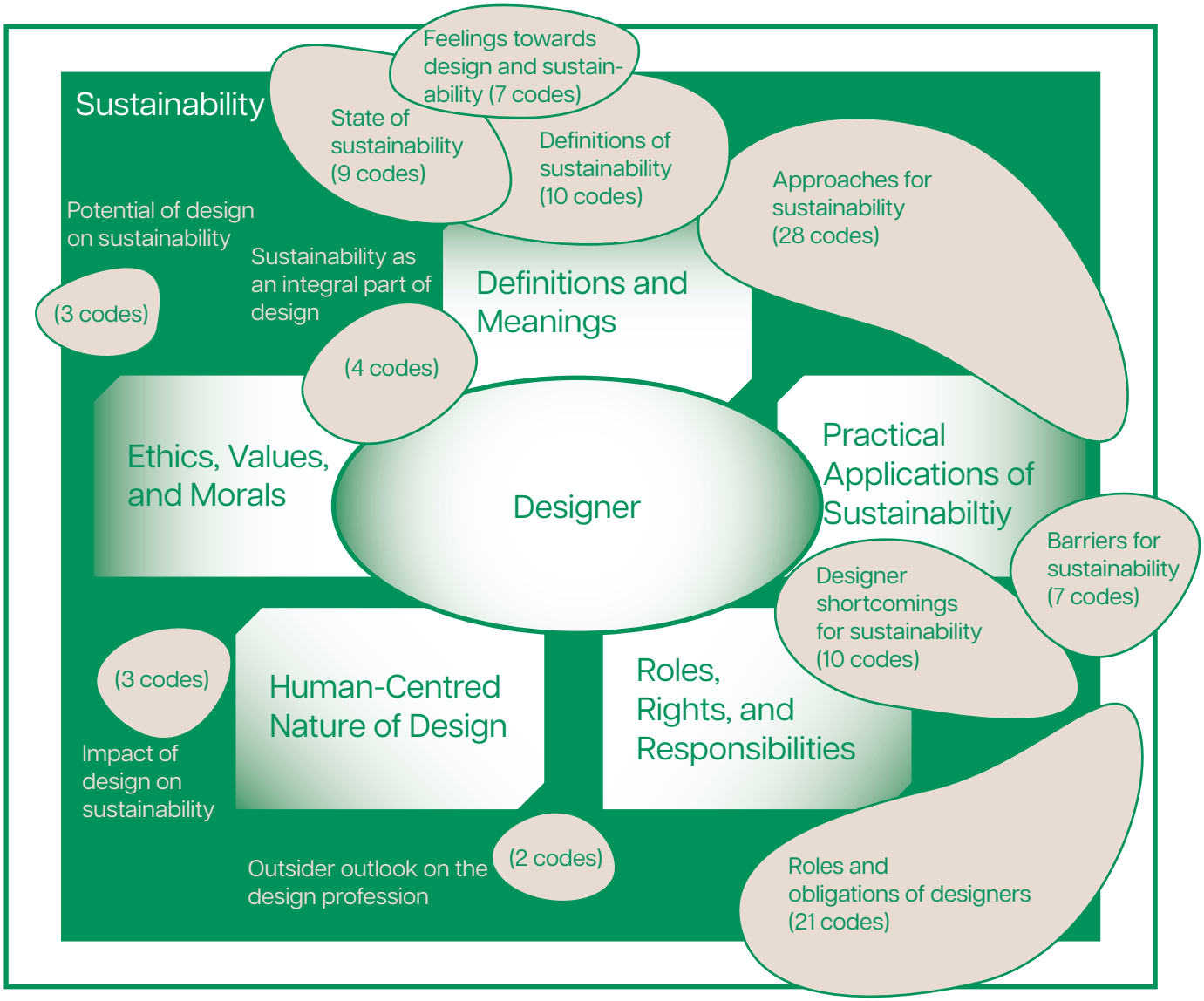


Figure 3: The subcodes mapped onto the conceptual framework

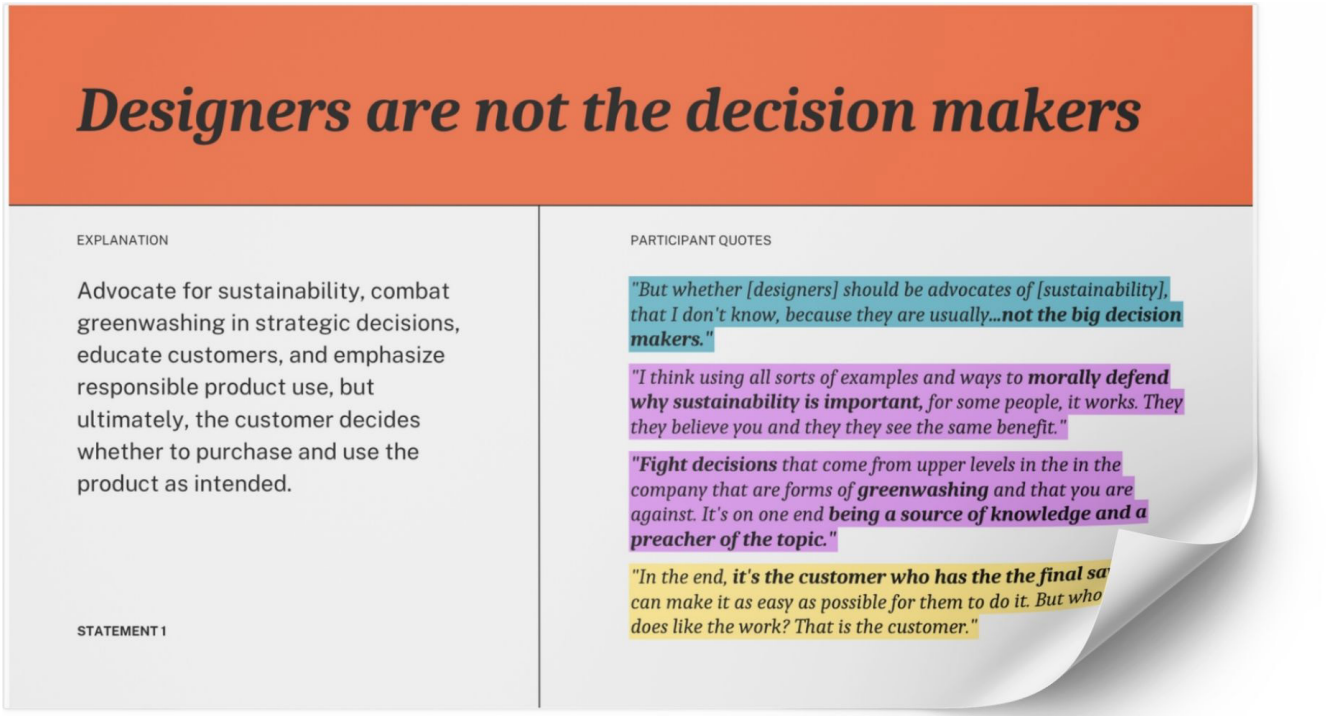


Figure 4: An example insight card, comprising the provocative statement, brief explanation, and supporting quotes

1.2.2.1 Designers are not the decision makers

"But whether [designers] should be advocates of [sustainability], that I don't know, because they are usually...not the big decision makers."

As much as designers have a certain degree of autonomy when it comes to their practices, there are still other stakeholders at play that guide or dictate their decisions. Those stakeholders can be hierarchically decisive like management or senior colleagues, but also indirectly decisive like customers or users. Given that, it is still important to advocate for sustainability, combat greenwashing in strategic decisions, educate customers, and emphasise responsible product use. Ultimately, however, the customer decides whether to purchase and use the product as intended or management makes the more significant decisions.

The interview participants elaborated on whether designers should advocate for sustainability in their companies, and if they should, how they could do it. Some mentioned the importance of top-down advocacy as it would be more effective since designers have limited power over decision-making. Some referred to still defending sustainability and fighting greenwashing whenever possible. The autonomy of the customer and their tendency to modify predicted product use behaviour was also mentioned as a limiting factor ("In the end, it's the customer who has the final say. We can make it as easy as possible for them to do it. But who actually does like the work? That is the customer.") when it comes to advocacy for sustainability within an organisation and impact on the outside world.

The insight that workplace conditions and policies may be limiting in designers' autonomy was also present in the literature

review, however, framing the customer or the user as the limiting factor was a novel finding from the interviews. All in all, this insight targets the research gap of further investigating the interactions of stakeholders in relation to the designer.

1.2.2.2 User-centricity first

"We will never leave away human-centred thinking, and then it's more a matter of maybe balancing it with environmental concerns."

The quality of the user experience still trumps sustainability concerns. Having said that, there is value in striving for a balance between convenience and sustainability to avoid compromising user experience. Ensuring that solutions prioritise both human-centeredness and environmental impact for effective behaviour change is key to sustainable development.

The interview participants were asked to share their thoughts on this dilemma of user-centricity versus sustainability. Key insights were that there is still resistance to sustainability given the reasoning that it takes over convenience, especially in products where convenience is one of the key characteristics or value propositions. Furthermore, some mentioned that sustainability is used as a marketing scheme or a public relations act to display a company as “sustainable” while the product itself is not actually such. They concluded this statement by pointing out that the user experience should not be overtaken by sustainability ploys. Additionally, some mentioned that they do not observe such a dilemma, and instead mentioned win-win situations where a product or service is both convenient and sustainable. They gave the example of products that use less energy as they are both environmentally sustainable and cost-effective at the convenience of the customer. Lastly, habit changes were also mentioned, referring to positive habit forming which is only possible if the user experience is positively received by the user.

In the literature, it was given that designers have a certain level of authority over the user, meaning that they can influence or direct their behaviours. Through the interviews, however, it became clear that they are still prioritising user needs regardless of them leading to sustainable behaviour change.

1.2.2.3 Speaking the business language is crucial

"I think you make a much stronger case when you align with other departments, so it should be an entire strategy and not just "design is saying this". So talk to the business, talk the language of business and come with good proposals, then you can move things."

The design function may still be seen as superfluous or superficial, as in lacking the proper alignment with other core strategic goals. To combat this outlook, it is advised to engage in sustainability as a group effort, align with other departments, communicate effectively, consider business models and innovations, and focus on personal improvement in those areas.

Multiple participants mentioned this so-called “language of business” when sharing their take on what specific actions designers can take to address sustainability. It was mentioned that different teams within an organisation have different goals and interests and that design should also align with those to create meaningful conversations. Not all participants pointed at this shared language, however, some also mentioned

the importance of business thinking and that in fact, designers can bring new and innovative business models to the table. They further elaborated that designers should improve their business savviness skills and scale up for all designers in general.

This insight was not present in the literature review yet it fills the research gap by highlighting the shortcomings of designers. Even though this lack of business vocabulary is not explicit in literature, it can still be considered a shortcoming.

1.2.2.4 Your solution is only effective if people buy it

"When a sustainability project is not "profitable" enough, it gets automatically killed. So you could argue like OK, maybe more patience and more long-term view is necessary there which comes with the changing mindset like being a bit open to possibilities."

The weight of profit is still high in companies, as it dictates whether a product is successful or not. It is worth mentioning that ultimately, products have an impact only when consumers purchase and use them, whether it is positive or negative. Here, designers should look for ways of designing products with the goal of creating profitability to increase sales and scale their overall impact through sustainable products.

Some participants mentioned that regardless of how sustainably a product is designed, if it is not purchased and used by the customer, it has close to no positive impact. Here, the polarised way of thinking between profitability and sustainability shifts, as mainly profitable products can also create a positive sustainable impact in the long run. Ultimately, a product that is in use can achieve the sustainability goals and targets. It is also worth mentioning that while profitability is prominently mentioned, there exists a longing to change this profit-oriented mindset by the designer.

This insight is aligned with the finding from the literature review that designers often prioritise other factors over sustainability. Here, profitability is the other factor that designers prioritise over sustainability concerns.

1.2.2.5 Designers can bring awareness via tangible ways

"But I think what a designer can bring is actually tie in those long-term goals that a company has persistent ability with human insight and contextual information for that matter. So it's like I, it's sort of bringing a bit of storytelling into the whole sustainability agenda, so making it much more relatable."

Designers can bring about an otherwise limited awareness of relevant issues through concrete, distinct ways. They could utilise tangible boundary objects to provoke and raise awareness of abstract issues effectively, enhancing the clarity of long-term goals by combining them with human insight and contextual information. This is one of the key contributions of design to the organisation, marrying the tangible and the intangible.

Sustainability is one of those rather abstract, complex issues that seem to lack immediately actionable dimensions. Design could bring this issue closer to Earth and make it more relatable to the members of an organisation. Some participants mentioned that they indeed use prototypes, storyboards, etc. to make sustainability more understandable and urgent to colleagues. Some further mentioned making them

deliberately provocative to raise awareness or start conversations. These actions are thought to be beneficial to bring sustainability closer to other indicators of success and advancement in an organisation.

Designers have certain methods and capabilities for transforming sustainability challenges into actionable and potentially sustainable futures, this is evident in the literature. Bringing tangibility could be considered an act that makes the problem more actionable.

1.2.2.6 Sustainability is a complex, systemic issue

"So I'm a bit in between; I'm optimistic and positive about what a sustainability-related project can do. But [on] the other side, I know that there's always implications when you do a sustainable project and that's where you start thinking of the connection with all the different aspects, so it becomes a system, right? Yeah. And a bit complex, but yeah."

There is no single sustainability project, it is all connected with other aspects. Although purely sustainability initiatives can create an impact, it is crucial to consider all implications since these projects are complex, interconnected, and relate to various facets of the system.

Participants mentioned their outlook on sustainability-related projects, highlighting the fact that there are always other implications other than sustainability ones. This points towards a multifaceted and multi-level issue that requires relevant tactics to tackle.

This insight helps fill the research gap of acquiring a more holistic understanding of the intersection between design and sustainability. It positions sustainability as a complex issue that is larger than design with deeper implications.

1.2.2.7 Design interventions are not yet holistic/integral

"In an ideal world, everything that relates to topics such as sustainability, accessibility or usability are all sort of interconnected and eventually have the same outcome, which is an improvement."

The hypothetical “perfect” product ticks all the boxes on all requirements. However, this is not necessarily possible as integrating sustainability, for instance, into all design decisions is crucial, but this might lead to compromises on aspects like usability and accessibility.

This multi-level way of thinking about products was mentioned through the interviews. Participants referred to many aspects of a product such as usability and accessibility and how it should never be a matter of choosing between them. However, some participants mentioned that this is in fact the reality and that there is always a compromise between the factors when designing. To avoid this, some suggested positioning sustainability as an inherent design act and not considering it as a separate entity. All these indicate the state of design interventions, which is not yet holistically integrated as one solid entity.

This insight was not present in the literature review yet, again, contributes to tackling the research gap of acquiring a more holistic understanding of design and sustainability.

1.2.2.8 Look at good examples for inspiration, but go beyond

"So what I would always think that design can do is push the boundaries of what exists already and sort of go a little bit beyond."

Getting inspired could be a good tactic when developing sustainable products. There are many examples out there in the market and one of the tasks of the designer is to identify which are good and which are bad examples. As designers are at the forefront of product development, and while reviewing other examples is beneficial, it should primarily serve as a benchmarking tool to surpass existing standards. This is one of the main contributions designers can bring to the product development process.

Participants elaborated on the purpose of examples in sustainable product development. While some mentioned that they do in fact study examples from the market, some mentioned that design should always strive to improve what is out there in the world. The “fuzzy front end” was also mentioned, as designers are situated more towards the uncertain areas of product development, they need to remain open-minded about possibilities when it comes to identifying and selecting alternatives. Lastly, it was also brought up that since designers are in this more uncertain area, they can be good candidates for sustainability advocates in an organisation.

This insight highlights what designers do informally when they encounter sustainability issues, besides referring to formally defined tools, approaches, and methods.

1.2.2.9 Not everyone is passionate for sustainability

"As a designer, you should always empathise with the people that are, let's say, anti-sustainability. You should understand why they are anti-sustainability to counter that with something that can convince them otherwise."

Designers often find themselves as one of the primary advocates for sustainability within an organisation. This situation is typical and can serve as a valuable opportunity to connect with individuals who may be apathetic or opposed to sustainability, including those who are sceptical or just indifferent.

During the interviews, the effort designers put into convincing others was mentioned repeatedly. For instance, one participant pointed out that in order to convince a stakeholder to be more sustainable, they should first comprehend their position and perspective. Only after that, can they counter them with an offer to change their mindsets. Furthermore, the true sense of human-centricity was also mentioned, in the sense that to be completely human-centred, one should consider all outlooks on a subject, even if it contracts one’s own. The effect of prototypes and testing was also mentioned, as by testing concepts with those against sustainable efforts, the designer can empathise more with the resistant individuals. Lastly, beyond being passionate, it was mentioned that being aware is not even commonplace when it comes to sustainability. It was pointed out that the term sustainability has become a buzzword and lost its true meaning to the extent that people do not even consider thinking about the notion.

This insight helps paint a picture of the

other stakeholders besides the designer and their outlook on sustainability.

1.2.2.10 Nudging the customer is not enough

"We can only achieve so much by just educating and sending the correct information to customers. We should also, in a way, do something with the product itself."

Guiding the users is a powerful strategy, yet for lasting success, the product itself needs to prioritise sustainability. This could be a matter of material selection but also the entire lifecycle of a product should be considered. Additionally, designers can leverage the emotional and behavioural traits of users to craft personalised experiences that can create impact. Here, it is important to mention groups that are generally overlooked to achieve a more inclusive value offering.

The interview participants mentioned making the user more aware of the better options that they can subsequently choose. They highlighted the fact that designers can create products and services that can achieve this goal. Additionally, especially when it comes to creating behaviour change, it was brought up that identifying and targeting the emotional cues could be beneficial. That way, users would keep coming back to the product and continue using it. Lastly, as one of the areas where design can create impact, it was mentioned that designers can treat sustainability in a way that could be adapted to each experience of each user.

This insight informs the research by outlining what designers think they can do and should do. By guiding or directing the user, it is given that the impact would not be as desired. The product itself should have some inherent qualities that make it sustainable.

1.2.2.11 Advocate by asking the right questions

"So how would you advocate [for sustainability]? I think that's just asking questions to the right people at the right time."

For designers, and other members of an organisation aiming to advocate for sustainability, engaging in meaningful discussions can make a lasting impact. Recognizing the priorities of key individuals can bring about significant transformations that can have a greater scale and impact on the entire stakeholder map.

When asked about the strategies of advocating for sustainability within an organisation, participants mentioned the role of conversations. Conversations that are with the crucial stakeholders can influence decisions if the stakeholder is persuaded by the designer. Furthermore, the power of questions was also mentioned. If the right questions are asked to the right people, they can help in triggering new ways of thinking and causing potential mindset shifts.

The relationships between stakeholders, especially those with more decision power, is outlined in this insight. This is significant as it helps define the interactions between the various members of an organisation, which is one of the points of the research gap of this thesis.

1.2.3 CONCLUSION

In this section, the interviews were conducted to gain in-depth understanding of

designers' perspectives regarding sustainability, and the findings from the interviews were outlined. Several key insights were revealed through the interviews, which are summarised in this section.

It was revealed that designers are not in positions of decision making. This phenomenon is twofold, on the hierarchical axis, management has the final saying when making decisions. On the other side, customers have the purchasing power which can guide the decisions by making the companies offer products customers would be more willing to purchase. Here, it is worth mentioning that designers do have some power of nudging the customers to perform certain behaviours yet still the qualities of the product itself determine its sustainability status. Additionally, it was reported that user-centricity is prioritised over sustainability when making product design decisions and that sustainability is not holistically integrated into the process, although it was noted that ultimately, both would co-exist in a product. Furthermore, the importance of physical artefacts was mentioned, arguing that it is one of the significant skills and one of the crucial contributions of the designer. Moreover, designers need to have a basic grasp of business concepts which is especially helpful when having conversations with other stakeholders who may have different priorities. They need to ask the right questions to the right people at the right time to trigger sustainability transformations. Designers also need to treat good sustainability examples as such, simply examples that they should strive to go beyond. Lastly, it was revealed that sustainability is a complex issue with a variety of stakeholders and not all of which are passionate about sustainability. This was framed to be a barrier for designers working towards more sustainable interventions.

These insights suggest that sustainability is currently a contested issue with a variety of viewpoints. Overall, it was highlighted that different stakeholders have different perspectives and the designer should be properly equipped with tools and skills to navigate towards impactful change. The findings from the interview study address the research goal of characterising how designers engage with sustainability by focusing on the roles, responsibilities, and barriers. Furthermore, the study provides the backdrop for the design intervention presented in this project.

The interview study, while providing rich and deep insights on the subject matter, has certain limitations. Namely, although all the participants fit the design practitioner title, they have different levels of work experience and rankings within their organisations. Further research is suggested to have a more narrowed group of participants in order to get a more focused perspective on sustainability and design. The participants were all from the Netherlands, to get a broader perspective on the issue, other countries could be considered when recruiting interview participants.

In conclusion, the insights gained from the interviews highlight the unique positioning of the designer in sustainable product development. Further in this project, this positioning is explored through sessions to contribute towards the research goal. Ultimately, a design intervention is created to facilitate the engagement.

Part 2:

Part 2 explains the design intervention, namely the strategic approach titled “Tactical Susta
starts with a co-creation session, continues with interview participant feedback, validation

Design

inability Cards". The design process behind the intervention is outlined in this part, which session, and ends on the final iteration of the concept.

2.1 CO-CREATION SESSION

"He [the industrial designer] will compromise up to a point but he refuses to budge on design principles he knows to be sound." (Dreyfuss, 1955)

2.1.1 INTRODUCTION & METHODS

A problem formulation was defined that outlines pain points and opportunities for which design directions were needed, based on the literature review and interview study: Designers must prioritise sustainability and adopt better-integrated approaches, but the lack of practical tools and the focus on technological and economic factors often overlook critical behavioural, ethical, and social aspects. Furthermore, a common language is needed between business people and designers to ensure marketable solutions, raise awareness through tangible methods, and learn from successful market examples.

To generate these design directions, a co-creation session was organised. The session took place on May 8, 2024, and lasted for one hour. The participants were master's students of the Industrial Design Engineering Faculty of Delft University of Technology. They were recruited through personal connections or student channels of instant messaging group chats. A recruitment message with an image was prepared, see Appendix H.

The session was held in person; the participants were given prior instructions to embody one of the following personas: designer, policymaker, customer, or management. The descriptions of which can be found in Appendix I. The goal of the session was to design an intervention that improves the engagement of sustainability and design for the designer but personas were still utilised to get the perspectives of other stakeholders around the designer, also due to the challenge of actually recruiting these individuals.

Three activities were performed during the co-creation session, facilitated by the researcher. After a short introduction of participants and their roles, participants were asked to study the insight cards and choose one or two. After their choice, they were asked to fill in an Empathy Map. Their contribution was based on their personas and they were asked to empathise with a hypothetical designer working in-house for a company in the Netherlands. The filled-in Empathy Map can be found in Appendix J. After the empathy round, the participants were further asked to fill in pain and gain points for the hypothetical designer. The facilitator, the researcher, highlighted some of the points put on the map. After this activity, the second activity "Problem Statement" was performed. In this activity, the participants were asked to come up with a singular statement that they could further work on; the facilitator facilitated this pro-

cess by guiding the discussion and noting down the relevant points (see Appendix K). Lastly, as the third activity, the participants were asked to come up with at least one "How Might We?" question. The facilitator collected these questions and put them on a board to be further shared with the participants (see Appendix L).

2.1.2 RESULTS & ANALYSIS

In total, three boards were filled in by the co-creation session participants. These boards were, in chronological order, Empathy Map, Problem Statement, and "How Might We?" questions. These boards can be found in the Appendices. This section outlines the contents of each board and analyses it for the design concept presented in the next section.

2.1.2.1 Empathy Map

The empty Empathy Map was given to the participants containing the following sections: What does the In-house designer hear, see, think and feel, and say and do. Furthermore, the last section comprised the pain and gain points of the said designer.

The participants filled in the board with an ample amount of sticky notes. The following is a highlight of relevant points made during this part of the session.

Think and feel?

Discussions were centred around inspiring the user to change their lifestyles into more sustainable ones without harming their quality of life. It was brought up that sometimes designers push the users to live sustainable lifestyles and at the same time making things more complicated for the user. It was pointed out that there lies a challenge to balance these two ends. Additionally, the notion of sufficiency was also brought up, in the sense of living well or the same on less.

Furthermore, it was expressed that the hypothetical designer sometimes feels demotivated when contemplating how to change the system of unsustainable consumption. The existence of many stakeholders and societal issues was brought up as a barrier in systems change. On the topic of multiple stakeholders, it was pointed out that each stakeholder has their own roles but they are not integrated; there is no dominant player and each stakeholder plays their game independently. In a sense, each stakeholder is operating in its own silo with no combination with others. This also brings value tensions between stakeholders, especially given that each has their own power and influence sphere.

Say and do?

Participants brought up the notion of "integrating sustainability for the sake of it," and elaborated on the lack of purpose and direction. From a management perspective, it is important to align the mindsets of the company and designers. Participants mentioned that although the company can make statements, these are not sufficient if the accessibility and usability aspects are missing thus sustainable solutions may fall short. Additionally, it was highlighted that in a company, the engineers are concerned with technicality, designers with sustainability and desirability, and the management with profitability. Hereby the question "how to make sustainability more profitable?" was posed.

In pushing the boundaries of a design case, designers play a critical and often provoca-

tive role. It was brought up that provoking is one of the roles of the designer in the process with the aim of bringing insights other stakeholders fixated on their own goals might miss. Furthermore, it was shared that especially for in-house designers, it might be challenging to redefine the problem statement as it is generally handled by management and any modifications need approval. However, designers are usually not involved in the strategy part which can lead to uncertainty about the product's ultimate trajectory.

Hear and see?

From a management perspective, designers ought to go beyond the traditional design domain. Reflection on the limits of the designer is crucial and here, business or economic training could be helpful. Participants brought up that a designer should have knowledge about a lot of domains and there is no issue in getting deeper training in one of the domains.

One of the participants mentioned that it is always good to have a designer in the boardroom or a manager in the design team. At its core, sustainability is thought to be financially burdensome. Having the designer or the manager in opposite teams could keep the integrity of the sustainability initiative and combat greenwashing. The company wants to communicate with the world that they are more sustainable. As a designer this might feel like an ethical dilemma, on one hand the designer thinks of themself as the voice of the customer and should be honest, and on the other hand, the designer is the voice of the company and should express accordingly.

Pain

The participants were asked to elaborate on the pain points for the hypothetical designer. It was mentioned that if the policy or strategy towards sustainability is not accepted by the consumer, it boils down to profit. For everyday customers, practical issues may be at play and this brings about a dilemma if we want to make the world sustainable but it conflicts with basic profits and benefits. If companies invest more in technology, there could be products that solve more sustainable problems without compromising on the customer aspect.

One other pain point mentioned was that the designer notices the customer absorbing the cost of being sustainable. It was highlighted that there could be a better approach.

Additionally, how you can change the consumer needs to be more sustainable was also mentioned, in the context that rather than changing only the customer perspective, a more permanent and effective strategy could be changing the underlying needs themselves.

Gain

In addition to pain points, gain points were also identified by the participants. The value of training was once again mentioned. If a designer decides to engage with training, they can prove their concepts with quantitative data and examples such as case studies. It was argued that this would be more valuable for the company, as it would give a look at the available data and the action opportunities.

Thinking beyond design was once again mentioned. It was brought up that in society, people are driven with ambition however within a company, employees are driven by money and getting promoted. Hereby it is worth mentioning the importance of economics and strategic education for the designers.

The tension between designers and non-designers was also mentioned. It was pointed out that not all businesses have the link of production and emissions, for example sharing economy or recycling companies. Yet, some participants shared that even digital companies and consultancies have sustainability goals, in many suitable formats.

2.1.2.2 Design Problem Statement

The following design problem statement was identified during the session: "I am an in-house designer. I am trying to integrate sustainability into the company culture, but sustainability is not prioritised because we cannot make money with it and it is not aligned with consumer values, which makes me feel useless, not contributing enough, and not seen."

2.1.2.3 How Might We? Questions

The following How Might We? Questions were identified during the session:

How might we...

- Turn sustainability into a KPI?

- **Make sustainability attractive?**

- **Spread awareness about the real problem that is greenwashing?**

- Empower designers with the ability to influence and make change against consumerism?

- Strictly restricted the sustainable policy on the suppliers of a product/service?

- **Integrate sustainable thinking like we did design thinking?**

- Include sustainability in the corporate strategy?

- **Engage employees in sustainability?**

- Train designers in business. Make sustainability profitable.

- Change customer behaviour. Bank on that.

- Align company goals better with sustainability goals?

- Change how management thinks about sustainability? Mental perception changes.

The ones in bold were selected to be the guiding questions for the design concept. These questions were selected as they provide an actionable direction for a design intervention and they are broad enough for further exploration yet narrow enough to have defined boundaries.

2.1.3 CONCLUSION

The co-creation session outlined in this section was set up to convert the insight cards into potential design directions. A group of master's students were selected to embody a set of personas that represent the stakeholders.

The session provided valuable insights into how different stakeholders react to sustainability issues faced by an organisation. This is particularly important, as also highlighted in the literature review, the designer has roles beyond traditional design roles which might include advocacy for sustainability and dissemination of relevant knowledge.

The Empathy Map exercise allowed for discussions on a hypothetical designer in a corporate setting. The discussions ranged from the challenge of inspiring sustainable lifestyle changes without compromising

quality of life of the user, the demotivation designers feel when trying to balance user values with company values, and the barriers posed by independent, siloed stakeholders with conflicting goals and interests. Participants also discussed "integrating sustainability for the sake of it," highlighting the need for purpose and direction in a sustainability intervention. Furthermore, the importance of aligning company and designer mindsets was discussed, followed by the roles of engineers, designers, and management in an organisation. Additionally, the provocative role of designers was elaborated on. The management perspective was also handled during the session, emphasising the boundaries of the designer in the context of other stakeholders. The need for financial and business training for designers was also mentioned along with the importance of integrating designers into decision-making processes to address ethical dilemmas regarding transparency and communication. Accommodating sustainability policies with customer acceptance and profitability, engaging with practical issues of everyday customers while preserving sustainability, being witness to customers absorbing the cost of sustainability efforts, and examining the strategies to change customer needs to more sustainable and effective ones were laid out as the pain points of the designer. Gain points, on the other hand, included the value of training programmes on quantitative data, the significance of financial and strategic education to extend the viewpoints of designers beyond design, and the observation of sustainability goals in contemporary businesses like digital companies and consultancies.

In total, twelve "How Might We?" questions were generated during the session and four were selected to be moved forward with. The problem statement of this thesis evolved to the following: Designers need sources of inspiration to imagine new ways of navigating sustainability issues which stems from a deeper need for guidance and direction. They face challenges when advocating for sustainability and fighting greenwashing in their organisations and need ways of justifying their actions to managers by proving their actions with references. Lastly, they need to align and empower stakeholders with different backgrounds on sustainability issues by engaging them through compelling/accessible ways and effectively communicating with them through a shared language. In the following section, the route from this statement to a full-fledged design concept is outlined.

Jerry Kavan
Transfăgărășan, Sibiu, Romania
2017

2.2 DESIGN CONCEPT

Based on the literature review, insights from the interviews, and the co-creation session, a design concept titled “Tactical Sustainability Cards” was generated through ideation techniques. This section outlines the process of idea generation and concept selection, and then describes the final concept.

2.2.1 BRAINWRITING

Brainwriting was utilised as the main ideation technique for the concept generation phase. A selection of four “How Might We?” questions from the co-creation session and two additional questions were used as the initial prompts for the multiple streams of ideation. See the four questions from the co-creation session in the previous section, the two added questions are as follows:

How might we leverage the many roles of the designer?

How might we guide the designer when they encounter sustainability issues?

Although typically Brainwriting requires multiple participants, due to a lack of time and resources, the technique was performed individually. See Appendix M for a screenshot of the Brainwriting process.

2.2.2 CONCEPT SELECTION

A concept that combines the desired qualities of multiple concepts was selected as the main design intervention of this project. This section showcases the discarded concepts and briefly motivates the reasoning.

2.2.2.1 Seamless Sustainability

As a method for redesigning existing products and services, Seamless Sustainability offers a compartmental way of approaching the design process. The method divides an existing user experience into steps and guides the designer to ideate on each step by improving the sustainability and user-centeredness. For each step, a numerical value is assigned to allow for comparisons between the old and redesigned concepts.

This concept was discarded as it forces the designer to quantify aspects of the designed experience, which may not be as straightforward. Furthermore, a redesign may not always be so linear that allows for comparisons between two distinct concepts. Additionally, it only operates on a narrow perspective on sustainability and user-centeredness with not much regard to other factors.

2.2.2.2 Metaphorical Designer Hats

A response to the question “How might we leverage the many roles of the designer?” Metaphorical Designer Hats are based on the roles such as the educator, devil’s advo-

cate, etc. The designer is expected to approach the problem via one of the hats and shift their perspective accordingly.

This concept was discarded as, although may be beneficial in other contexts, it does not have a sustainability focus. Thus, this concept does not answer the problem statement nor the research goal.

2.2.2.3 "Making Sustainability Attractive" Campaign

This concept aims to foster an engaging sustainability culture within a given company through creative initiatives, awareness campaigns, and ongoing employee involvement and education.

This concept was discarded as such a campaign might be company-specific and needs certain insights relevant to the given company. Thus, a universal campaign would not work for this concept, given the lack of a client for this thesis.

2.2.2.4 Set of Inspiring Sustainability Project Examples

Answering the question "How might we engage employees in sustainability?" This set of project examples aims to curate a collection of innovative sustainability initiatives from around the globe, showcasing actionable solutions for a greener future.

As much as it might be an inspiring tool, the scope is quite narrow. This alone would not be a full-fledged concept, but perhaps a component of a bigger design intervention.

2.3.3 TACTICAL SUSTAINABILITY CARDS (FIRST VERSION)

Tactical Sustainability Cards is a tool in the form of a set of cards which helps the designer with their encounters with sustainability in their practice. They are presented as a digital document that could either be printed and used during in-person meetings or used digitally during online meetings.

These cards are designed to be used either during the early design stages for inspiration or in the final stages for communication with customers. The purpose is to serve as a reference point for designers, providing a common set of vocabulary to justify their actions in sustainability and facilitate conversations with other stakeholders. The front side of each card includes the title of the tactic, a brief explanation of the tactic, and a successful example from the market that demonstrates the exemplary qualities of the tactic. On the back are approaches and models from academic literature that support actions in line with the tactic, which are mapped on axes of Tactical-Strategic and Focused-Systemic. The axis Focused-Systemic was adapted from the DfS evolutionary framework (Ceschin & Gaziulusoy, 2016) and the axis Tactical-Strategic was developed through iterations in collaboration with the supervisors of this thesis. The validation of these axes is presented in section 2.4. This mapping aids the designer when choosing relevant approaches and models depending on the design project they are working on.

Figure 5 is one of the Tactical Sustainability Cards. Please refer to Figure 6 (next spread) for the remainder of the cards.

2.3.3.1 Tactical Sustainability Cards Workshop Context

A workshop context in which the cards are to be used was also designed. This section outlines this workshop and tells a story of an example use case.

The Tactical Sustainability Cards are to be used during the "second diamond" of the Double Diamond design process (Design Council, 2015). This diamond comprises the "Develop" and "Deliver" steps. The cards can help in the Develop step to inspire and facilitate co-design, and in the Deliver step, help communicate the final concept. A two-part workshop is devised to orchestrate a group of stakeholders. The goal in the first part is to make use of the examples to ideate as many concepts as possible aligned with the tactics. In the second part, one of the concepts and one of the tactics is selected to develop a communication/implementation strategy.

Develop

Based on the insights and the design challenge pre-defined in the first diamond, the participants are asked to select a couple of cards, study them, and ideate one concept per card. These concepts are then shared with the group and discussed. The key point is to observe the effect of the different tactics on the same design challenge. One of the concepts is chosen via dot voting or other group decision making tools. Afterwards, the group is asked to spend some time to further develop the concept using the Approaches and Models.

Deliver

After the concept is fully developed, a communication/implementation strategy is designed based on the card that was used while creating the concept. The example on the card, again, could be a source of inspiration. See Figure 7 (next spread) for an overview of the workshop.

Alternative Use

For higher-level contexts, the All Cards Mapping could be used. Here, depending on how Tactical, Strategic, Focused, or Systemic an intervention is desired to be, a corresponding card could be chosen directly. See Figure 8 (next spread) for the All Cards Mapping.

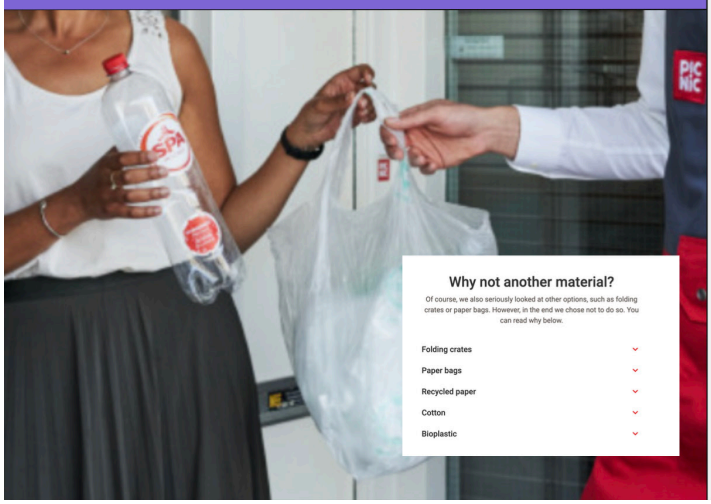
Use Case Example

Company A wants to redesign their product "A" to be more sustainable. While doing so, they want to maintain their innovative positioning in the market. They try tools and methods for sustainability, yet they are quite incremental and material/manufacturing specific. They resort to the design team for this redesign, they are intrigued, yet are also overburdened with other priorities and have limited knowledge in sustainability.

The company acquires the Tactical Sustainability Cards for the design team. The team studies the cards and starts ideating various concepts. In a short time, they have multiple concepts that tackle sustainability in an innovative manner. Using the cards, they are able to explain their design decisions with academic references and proper language. The management, which listens to this justification, is able to make sense of the decisions and comprehend the context in which they were taken. Ultimately, a new redesign is made that is more sustainable and innovative.

TACTICAL SUSTAINABILITY CARDS

Explain



Products and services that do not seem sustainable initially could face customer resistance despite having lower environmental footprints. If the sustainability benefits are not clear, communicate with customers using factual yet simple language to explain the positive impact.

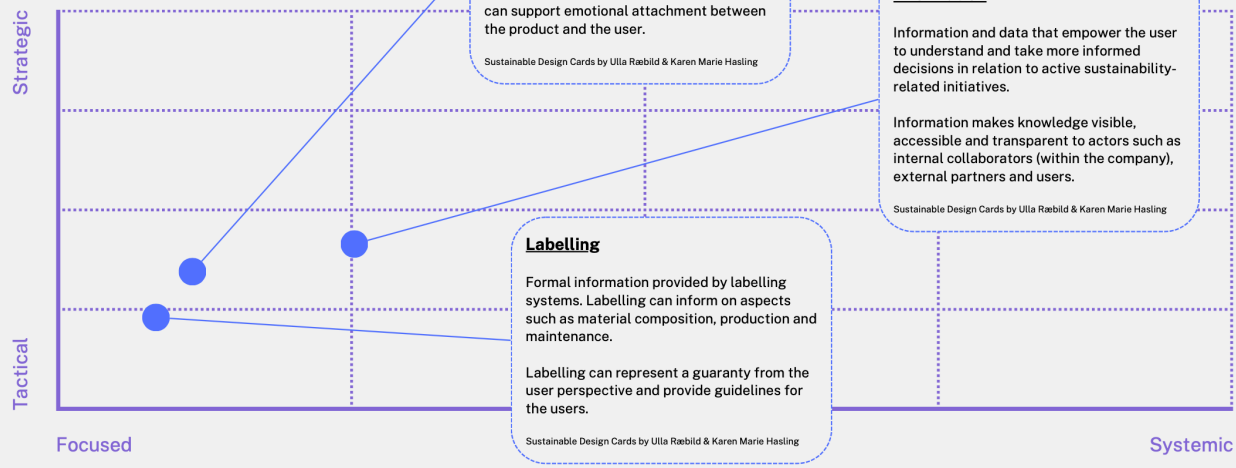
Picnic Plastic Bags

Online grocery store Picnic opts for plastic bags for product deliveries. Contrary to apparent eco-friendly options like paper bags, they clarify on their website that plastic bags reduce their environmental footprint, illustrating this through comparisons.

Explain

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



Product Honesty

Visible markers supporting transparency and informing the user about a product's development, manufacturing and potential former use.

Visible and honest product characteristics can support emotional attachment between the product and the user.

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

Information

Information and data that empower the user to understand and take more informed decisions in relation to active sustainability-related initiatives.

Information makes knowledge visible, accessible and transparent to actors such as internal collaborators (within the company), external partners and users.

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

Labelling

Formal information provided by labelling systems. Labelling can inform on aspects such as material composition, production and maintenance.

Labelling can represent a guaranty from the user perspective and provide guidelines for the users.

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

Figure 5: One of the Tactical Sustainability Cards, front and back side

Figure 6: All Tactical Sustainability Cards, printed

2.3.4 CONCLUSION

Tactical Sustainability Cards is a strategic approach that provides an innovative take on sustainability in the design process. The cards comprise a tactic, a description of the tactic, an inspiring example, and relevant literature. The cards are to be used in a workshop context which is situated in the second diamond of the Double Diamond design process framework.

The cards could be acquired by management to be used by multiple teams. For the design team, for instance, they can help create concepts that are aligned with literature, innovative, and sustainable. The cards manage to do this by giving inspiring examples, interesting prompts, and promoting creativity. For co-creation sessions where non-designers are present, the cards can help with aligning them and providing a common agenda. They can do so by providing a shared and common language as a reference point. Furthermore, for innovation teams, the cards can promote creative thinking. By encouraging experimentation and making sustainability coexist with innovation, the innovation teams can make use of these cards. Lastly, for sustainability teams, they can have them go beyond traditional sustainability approaches such as total bans, complete reductions, etc.

Useful across various teams, Tactical Sustainability Cards offer a versatile tool that integrates sustainability seamlessly into the design process. They help design teams create sustainable concepts, align non-designers in co-creation sessions, and promote innovation beyond traditional methods.

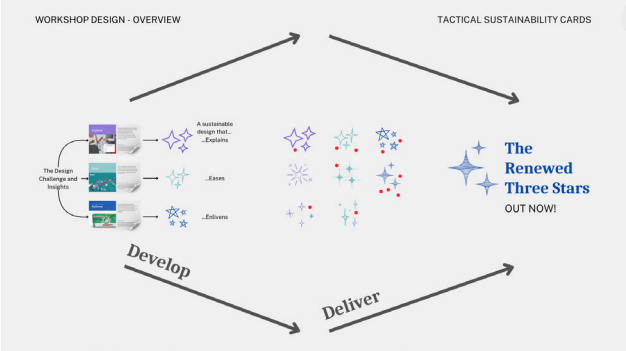


Figure 7: Tactical Sustainability Cards Workshop Design Overview

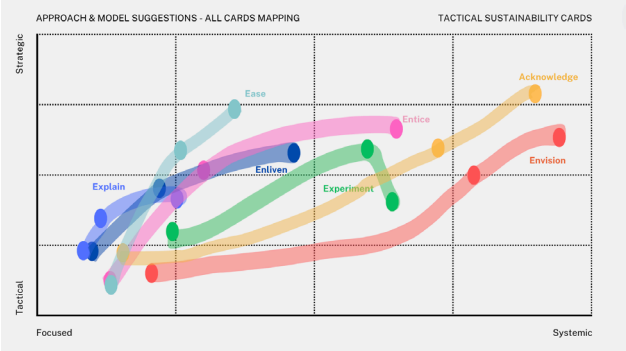


Figure 8: All Cards Mapping

2.3 FEEDBACK FROM INTERVIEW PARTICIPANTS

2.3.1 INTRODUCTION

As previously agreed upon with the interview participants, feedback on the developed design concept was requested following the interviews and the design phase. The purpose behind this was to get an informed look into the feasibility, desirability, and viability of the concept by practising professionals.

2.3.2 METHODS

An email was sent to the interview participants, approximately one month after the last interview. The email contained a brief refresher about the project and a reminder of the interview. The prompt was to answer three questions based on their own professional expertise. The questions asked in the email were as follows:

- How effectively do the cards address the challenges and needs you mentioned in your interview?

    - This question refers back to the interview and asks the participant to elaborate on the challenges and needs mentioned. It is asked to find out the feasibility and viability of the cards.

- Do you see value in using these cards in your practice? If yes, how?

    - This question was asked to get the participant elaborate on the desir ability of the cards.

- Do you have any other feedback you would like to share for further improvement?

    - Lastly, with this question the range of answers was left as broad as possi ble to get a variety of viewpoints.

After sending the initial email, a reminder email was sent to participants approximately a week and a half later.

2.3.3 RESULTS & ANALYSIS

The replies from the participants were analysed and clustered under headings. In this section, those headings are presented.

2.3.3.1 The cards provide awareness of an overview of strategic directions

Participants mentioned that as a designer, it might be a challenge to be completely aware of all possible actions one can take to improve the sustainability of their design interventions. The cards would be useful in the regard that they provide a structured overview of a variety of strategic directions.

2.3.3.2 Provide a source of inspiration and imagination

The inspirational quality of the cards was mentioned, in the sense that especially in the early stages of the design process, the cards broaden the imagination of the designers. The descriptions of the cards are especially inspiring and makes the designer think about how they could make a new sustainable product or service in different ways. It is also mentioned that the cards achieve this in a focused way without distracting from the main points.

2.3.3.3 Potential to be part of an evaluation mechanism

While some participants mentioned that they would first need to test the cards in order to determine how and when they could use them, some mentioned that the cards could potentially find a place specifically in the evaluation mechanism, especially when looking for categories a design concept belongs to, providing freedom to modify the design to perhaps fall instead into another category.

2.3.3.4 A substantial academic source

The cards are to be a substantial academic source since they are rooted in literature and direct the designer to academic works thanks to the examples on the back.

On the other hand, some participants mentioned that the academic nature of the cards could pose a barrier to people with a non-academic background as they may be unclear or difficult to comprehend.

2.3.3.5 Relevant for communication and storytelling

Especially in the later stages of the design process, participants mentioned that the cards could be helpful with communicating the product concept. The examples on the front of the cards have a clear intent and purpose as it is relevant to get an idea of what other companies are doing and in what ways, specifically when storytelling.

2.3.3.6 Align people on a shared mindset, such as during ideation sessions

Participants mentioned that although they would need to give the card a try in a project setting, they can assume that they would help with aligning a group of people around a shared mindset. This would especially be helpful in guiding ideation sessions where a purpose is sought and a direction is given.

Some participants mentioned the need for collaboration with other departments during the interviews. They expressed that these cards can help with meetings or workshops with members from other departments.

2.3.3.7 Show the complexity of sustainability challenges

The examples are thought to be showing the complexity and multifaceted nature of sustainability challenges. Specifically, the axis of focused-systematic arguably expresses this clearly.

2.3.3.8 Help start a conversation

The cards serve a purpose of starting a conversation via interesting examples that may lead to an insightful discussion.

2.3.3.9 Highlight a linear correlation between focusedness and tacticallness

Some participants mentioned their observation of a linear correlation where more focused means more tactical with the mapped approaches and models on the back of the cards. They pointed out that this in itself could be an interesting finding. Furthermore, the shape of the graph was thought to be hinting at a bigger importance given to the more gradual increase in the focused-systemic axis.

However, some participants mentioned that the axes and specifically the mappings on the back are not clear at times. They elaborated that the models and approaches could arguably be mapped differently than what is presented.

2.3.3.10 Focus more on how to implement sustainability, but not why

One point of criticism was on how the cards do not explain the reasoning behind the importance of sustainability. Instead, they focus solely on ways of implementing sustainable interventions. This was pointed out alongside the statement that one of the more challenging aspects for a designer is to persuade business executives to take on more sustainable practices as sustainability is still observed as a costly, nice to have.

2.3.3.11 A more flexible format is needed to remain relevant

Some participants mentioned that the format of the cards is not flexible enough to be updated over time. A website or a similar more dynamic format would be more helpful instead of a static document. This was brought up as a point of feedback to increase the relevancy of the cards and keep it at a high level for the future.

2.3.3.12 Lack of actionable questions or prompts, mainly a communication device

Contrary to previous points, some participants mentioned that the cards limit their imagination in the sense that they lack actionable questions or prompts. This is especially important if the designer wants to use one of the examples in the cards and adapt it to their work. At the moment, the cards are thought of as a communication device rather than an action device. There still needs to be work done on making them more actionable or thought provoking for the designer.

Some participants mentioned that there needs to be some guidance on how to use the cards, for instance a workshop. The context around the cards still needs to be defined, especially in settings where multidisciplinary backgrounds come together.

2.3.3.13 Do not provide a solution to address different sustainability impacts

The cards were argued to be not focused enough on the specific challenges the designer faces at their company. It was mentioned that they need to address different sustainability impact areas and the cards do not target that.

2.3.3.14 The cards alone are not enough for golden ideas, more triggers needed

Participants mentioned that the examples on the cards present instances of entrepreneurial thinking with a sustainability purpose. It was argued that, although these are successful examples, they are not necessarily the outputs of using a tool like Tactical Sustainability Cards. The participants suggested combining other triggers with the cards, for instance market knowledge, user-business insights, and technology. The cards were thought of as merely categorising approaches and providing insights, but not necessarily the initial prompt to bring about an innovative idea.

2.4 VALIDATION SESSION

To validate the design concept and get a final round of feedback, a validation session was organised.

2.4.1 INTRODUCTION & METHODS

The session took place on June 28, 2024, and lasted for one hour. This session was joined by a group of PhD candidates at the Industrial Design Engineering Faculty of Delft University of Technology. They were recruited through personal connections or through thesis supervisors.

The session was held in person; the participants were not given any prior instructions. The goal of the session was to polish the design concept with final improvements and investigate more into potential use cases.

The session commenced with a round of introduction by the participants followed by a brief overview of the research by the facilitator, the researcher. The title of the thesis, the research question, literature review findings, research gap, and the research goal were shared. The problem statement was presented followed by the design concept, the Tactical Sustainability Cards. The main activity of the session was "Cards in Action," where the participants were asked to redesign a product or service using the Tactical Sustainability Cards. The reusable coffee cup-token system in use at the PhD candidates' university campus was given to them by the facilitator to be redesigned. This example was selected as the participants already had some familiarity with and there was already discourse about potential improvements. The participants were asked to pick one or two cards, study them and ask questions, if there were any. Afterward, they were instructed to ideate on redesign concept per card. Sticky notes and markers were provided to help the participants communicate their concepts. Lastly, they were asked to share the concepts and explain their processes.

2.4.2 RESULTS & ANALYSIS

In total, four concepts were developed during the validation session. A group ideation session was held in which the cards "Explain," "Acknowledge," "Envision", and "Experiment" were used. For Explain, an intervention to the existing cup was ideated, where on the cup, it is written how many paper cups are equal to using this reusable cup in terms of environmental impact. For Acknowledge, it was argued that the product and the brand can communicate that the system is not optimal but it helps with sustainability goals. For Envision, installing drop-off points around a given location was pointed out as a way to rethink the established system of using paper cups in businesses. For Experiment, ideation in a setting with no constraints was performed. The concept generated was a pick-up service where an employee from the cafe comes and picks up your used cups instead of returning them. Other ideas that were not necessarily in relation to the cards were also brought up, such as getting a free coffee if one has many tokens. The feedback

from the participants were analysed and clustered under headings. In this section, those headings are presented.

2.4.2.1 Considering other stakeholders

Participants mentioned the target audience for the redesign, mentioning the consumer as well as other stakeholders such as businesses. The hesitation businesses might have in implementing sustainable solutions was mentioned, as well as the burden of accommodating a system like the reusable cup in terms of space, infrastructure, etc. requirements.

2.4.2.2 Clarity of instructions

The order in which the cards are to be used was questioned during the validation session. It was brought up that there is not necessarily an order and even though some cards might better suit the earlier or the later stages of the second diamond, the inherent product qualities are to be redesigned in the early steps, not just the communication or implementation strategies in the later steps.

2.4.2.3 Goal and scope of the cards

Participants scrutinised not starting with a clear goal and scope for the redesign. They mentioned that the cards would be helpful if there is a clear destination or future vision, where the cards would serve as the method of getting there. The lack of a starting point was a common point of criticism.

The all cards mapping was also elaborated on, in the sense that the process could start with determining the maturity of the product at hand, mapping on the graph, and choosing which tactic to go with accordingly. It was also brought up that the more systemic it gets, the more strategic it becomes on the graph.

Starting with enablers and barriers, then coming up with the strategy to target them was recommended as a way of reframing the cards. Continuing with a narrative about the product, defining the case and scope, and lastly defining what is desired to be realised was pointed out as a logical series of steps. Following these steps, it was suggested that the user of the cards can dig deeper with the references on the back.

2.4.2.4 Practical improvements on the cards

Some practical suggestions were also shared during the session to improve the cards. For instance, the axes on the back were thought to be complicated and abstract. It was brought up that the cards are called tactical yet one of the axes is tactical-strategic. The axis focused-systemic was suggested to be replaced with individual-systemic. Furthermore, putting simple definitions of tactics was recommended, as well as some guidance on how to follow them in the form of steps, questions, or prompts. Putting an inspirational question between the definition and example was also recommended.

2.4.3 TACTICAL SUSTAINABILITY CARDS (FINAL VERSION)

The cards were updated based on the feedback from the interview participants as well as the validation session. The main modification was made to the front side of the cards, namely a dictionary definition was added for clarity as well as an inspiring prompt question for a more actionable effect. The text was also edited to improve on the length and depth. Furthermore, the axes on the back were renamed, the axis was changed from focused-systemic to individual-systemic. Figure 9 (next page) is one of the updated cards. See Appendix N for the remainder of the final cards. Lastly, changes to the workshop context were also made. Now, the workshop starts by clearly defining a goal to work on during the session. The goal could be about the scope of the design, the affected stakeholders, or any other strategic purpose.

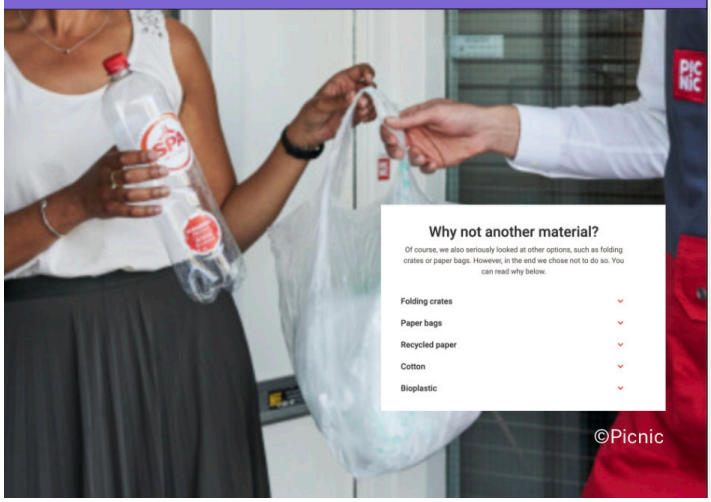
2.4.4 CONCLUSION

The Tactical Sustainability Cards were improved and validated through feedback from interview participants and a validation session with PhD students. The modifications were mainly on the cards, but some changes were made to the workshop context as well. Overall, the goal and purpose of the cards were clarified. In doing so, it was aimed to improve the applicability of the cards in various settings of ideation, co-creation, and innovation.

TACTICAL SUSTAINABILITY CARDS

Explain

To give the reason for or cause of (Merriam-Webster, n.d.)



Products and services that do not seem sustainable initially could face customer resistance despite having lower environmental footprints. Communicate with customers using factual yet simple language to explain the positive impact. ***How can you clearly communicate hidden sustainability benefits to inspire customer trust and engagement?***

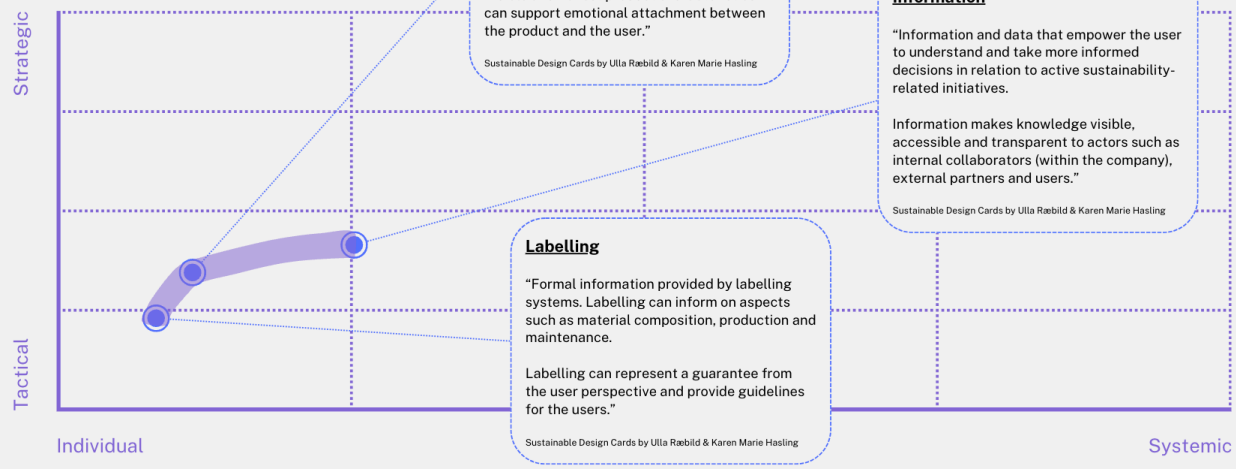
Picnic Plastic Bags

Online grocery store Picnic opts for plastic bags for product deliveries. Contrary to apparent eco-friendly options like paper bags, they clarify on their website that plastic bags reduce their environmental footprint, illustrating this through comparisons.

Explain

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



Product Honesty

"Visible markers supporting transparency and informing the user about a product's development, manufacturing and potential former use.

Visible and honest product characteristics can support emotional attachment between the product and the user."

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

Information

"Information and data that empower the user to understand and take more informed decisions in relation to active sustainability-related initiatives.

Information makes knowledge visible, accessible and transparent to actors such as internal collaborators (within the company), external partners and users."

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

Labelling

"Formal information provided by labelling systems. Labelling can inform on aspects such as material composition, production and maintenance.

Labelling can represent a guarantee from the user perspective and provide guidelines for the users."

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

Figure 9: Final version of the Tactical Sustainability Cards, front and back

3. CONCLUSION

This thesis investigated the engagement designers have with sustainability in their professional practices. Part 1: Research addressed this engagement through a literature review and a research gap was outlined, wherein prior research was detected to be focused on analysing existing tools and methods but not on comprehending the point of view on sustainability of professional designers. Based on this gap, the research goal was defined. From there, the thesis aimed to explore how professional designers in Netherlands-based companies subjectively conceptualise sustainability in order to identify opportunities for new tools and methods. Following the literature review, the problem statement was defined to be the lack of practical guidance for designers in the form of actionable implications to target sustainability issues in organisational settings with broader effect on society. An interview study was devised to gain in-depth knowledge on the designers' personal experiences and collect insights for design opportunities, focusing on values, attitudes, roles, and responsibilities. Alongside the interviews, in Part 2: Design, a co-creation session was organised to transform the insights into design questions. This session, in turn, transformed the problem statement to designers needing inspiration and guidance to navigate sustainability issues, justify their sustainable actions to managers via academic references, and align various stakeholders around a shared sustainability language. Ideation based on this problem statement led to multiple concepts, ultimately the concept Tactical Sustainability Cards was selected. This concept was validated through feedback from interview participants and a validation session where a final iteration was done based on the response from participants. This final iteration established Tactical Sustainability Cards as a practical tool for designers to integrate sustainability into their practices, promoting informed decision-making and alignment across stakeholders in organisational settings.

In the literature review phase, this thesis explored examples of seminal work in the field alongside more current works in the Design for Sustainability field and adjacent fields. Supporting this review, semi-structured interviews bolstered the base needed to build onto in terms of a prospective design intervention. This design intervention, namely the Tactical Sustainability Cards, is a strategic approach that provides an innovative take on sustainability for the design field. Useful across various teams, the cards offer a multi purpose tool that integrates sustainability into the design process. They support design teams in ideating sustainable concepts, but also aligning non-designers in co-creation sessions, and promoting innovation beyond traditional approaches. The cards guide the user by offering a tactic they can implement alongside a brief explanation, definition, an inspiring prompt question, and a realised example from industry. Furthermore, they provide relevant pieces of literature to justify design decisions with credible sources.

While this study provides significant insights, it also has certain limitations. For the research part, interviews were used as the main method of data collection. Although all interview participants fit the

sought design practitioner title, they were of different levels of work experience and ranking in their organisations. A more coherent group of participants could provide more accurate findings. In addition, the participants were all from the Netherlands, a more international recruitment might be preferred to get a more broadly-applicable result. Furthermore, as with every qualitative interview study, there is the limit of bias from the participants although the subjectivity was framed as a contributing factor for the design intervention. The sample size could also be increased, which would allow for more varied responses. For the design intervention, although it was validated through feedback from interview participants and PhD candidates, no real life trials were performed. For the next stages of this study, collaborating with organisations and having them test out the concept could increase the validity, while providing important insights into the feasibility, desirability, and viability. Having said that, within the boundaries of this project, the applicability to real life scenarios was ensured to the best of the researcher's ability.

Given the threats of "buzzwordification" of sustainability and greenwashing, and alongside the salient discourse of sustainability across fields, the implications of this thesis are manifold. Most critically, the dilemma between innovation and sustainability is handled in novel ways which may hint towards scenarios where they coexist. These scenarios are paramount for the design field in this age where environmental pressures are confronted with capitalistic pressures. Designers are challenged with an existential threat of having to design less or not designing at all. Conversely around sustainability issues, designers are put on the spot and assigned the responsibility to design both innovatively and sustainably. Examples of designs that fail to do either or both are proof that designers feel confused and futile. This thesis with the design intervention "Tactical Sustainability Cards," is an effort to alleviate the pains and capitalise on the gains designers might encounter while they navigate sustainability issues. It manages to do so by bridging the gap between theory and practise, highlighting the valuable research while packaging actionable leads. All in all, if provided with the proper tools and hospitable contexts, design could accommodate both innovation and sustainability, which is demonstrated in the interviews with designers presented in this thesis. These first-hand accounts should be taken into consideration as manifestations of enthusiasm for the design field to continue tackling sustainability issues while ensuring innovative thinking. Also demonstrated in the interviews, is the argument that society needs both not only to survive but also flourish. While the scope of this thesis is limited, the implications are desired to go beyond these limits allowing for an environmentally, socially, and innovatively sustainable society.

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APPENDIX A. INTERVIEW PREPARATION PROCESS VISUAL REPRESENTA-TION


Exploring Tools, Approaches, and Methods of Designers Engaging with Sustainability
tools
toolkits
approaches
methods
guidelines
Investigating the Viability of Seamless Sustainability
seamless
needs
concern
sustainable development
sustainability definitions
individual
privacy
Designing Sustainable and User-Centered Product Service Systems with Human-Centered Design Approach
designer agency
human-centred design
user-centred design
product service systems
material choice
resources
Strategies for Change and Collaboration
behaviour change
substitution
redesigning
trade-off
enforcement
win-win
barriers
challenges
paradox
conflict
compromise
Ethics, Authority, and Responsibility in Society
ethics
ecology
company
activism
morals
marginalised groups
authority
power
responsibility
balance
government
legislation
rules
regulations
rights
freedom
roles
user
customer
consumer
facilitator
leader
Definitions and Meanings
sustainability definitions
sustainable development
ecology
Practical Applications of Sustainability
redesigning
material choice
product service systems
behaviour change
substitution
tools
methods
approaches
toolkits
guidelines
resources
barriers
needs
challenges
Roles, Rights, and Responsibilities
legislation
enforcement
government
company
individual
consumer
marginalised groups
customer
user
facilitator
leader
designer
Human-Centred Nature of Design
seamless
user-centred design
human-centred design
paradox
win-win
balance
compromise
conflict
trade-off
Ethics, Values, and Morals
authority
designer agency
power
activism
responsibility
rights
freedom
morals
ethics
rules
regulations
privacy
concern
Who are the stakeholders concerned with a sustainability decision?
What are the barriers you run into when engaging with sustainability?
What resources or tools do you rely on to stay informed about sustainable design practices and solutions?
In your opinion, what are the main challenges that designers face when trying to integrate environmental sustainability into their projects?
What are the barriers you run into when engaging with sustainability?
What effects you would seek when designing a "sustainable" product/service?
How aware are you of the unwanted implications?
How do the notions of human-centred design and sustainability interact?
Can you give an example of a project where you were able to achieve a successful balance between environmental sustainability and other project requirements? What factors contributed to this success?
Think of the latest project you worked on. Were there any sustainability concerns at play during the design process?
Hypothetically removing/adding this concern, what would have been different?
Think of a project you consider "sustainable". How do you come to this conclusion?
I would like to start by asking you to describe what you do here.
Can you explain a typical design process from start to finish?
In this study I am using the Brundtland definition of Sustainable development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
What does this definition mean to you in your practice?
How does your definition compare to this definition?
Do we have the right to change the behaviours of the customer? Please elaborate.
What do you need as a designer to feel more prepared when engaging with sustainability?
What role would you assign to the designer in sustainable development?
Activist, advocate, facilitator, leader, follower, etc.
What can we do as designers for a more sustainable society?
If you could change one thing, what would you change in your practice in the context of sustainability?
How accepting you would be to a new design for sustainability tool?
Imagine being given a brief to make an existing product/service/system more successful. Where would you start? What would your process look like?
What resources would you refer to? (Colleague, data, know-how, etc.)
observe the present 1
recall the past 2
3
reflecting on the past
4
Hi (name), how are you doing?
Now I want you to reflect on the past and imagine the future.
First I want you to talk about who you are and what you do here
Well today we are here to talk about design and sustainability
How do you feel when you put design and sustainability together?
Any conflicts? Any agreements?
How do you measure these?
How can designers lead to a more sustainable development
What is our potential? Skills, methods, ways of doing, etc.
What are our shortcomings
Who makes the crucial decisions, whether you will consider sustainability or not
How can designers contribute to a more sustainable development?
We want to be more sustainable while being human-centered
Hi, how are you
Who are you, what do you do
What sustainability tools do you currently use?
Can you explain how a product/service can be both sustainable and human-centered at the same time?
How can designers contribute to a more sustainable development?
What strategies or criteria do you use to ensure that sustainability is prioritized in your decision-making process?
Can we talk about autonomy of the user
Can designers change the behavior of the human population? Are we allowed to?
Do we have the agency, authority, power to do change
Do you prioritize sustainability
Do you ever catch yourself choosing sustainability at the sake of other factors
What strategies or criteria do you use to ensure that sustainability is prioritized in your decision-making process?
How do HCD and sustainability relate?
Can a design be sustainable and human-centered at the same time?
Is the social and people side of sustainability overlooked
Do you know sustainability can have unwanted implications
Can you explain how a product/service can be both sustainable and human-centered at the same time?
What barriers and challenges you run into
What sustainability tools do you use
Are you willing and interested in trying new approaches
What sustainability tools do you currently use?

APPENDIX B. INTE

Interview Guide

Introduction
Hello, good morning/afternoon/evening. Thank you for taking the time to do this interview. My name is Ömer, I am a master's student at TU Delft. I study strategic product design and I conduct these interviews for my thesis.

Informed Consent Reminder
We are here today to talk about how designers, like you, engage with the notion of sustainability in their practice. But before that, I would like to remind you of the informed consent. The purpose of this research study is to learn about designers' experiences addressing sustainability in their practice and will take you approximately 60 minutes to complete. The data (a recorded interview, for the ease of collecting answers) will be used for transcription, coding, and analysis; the insights of which will be referred to in designing a strategic approach to be published as part of the Master's thesis. I will be asking you to elaborate on your attitudes, values, roles, and responsibilities regarding sustainability within your practice at your company.

In this study, your participation is entirely voluntary and you can withdraw at any time with no consequences. There are no right or wrong answers; you are free to omit any questions. The recordings will be erased after the transcription and your identity will be kept anonymous.

Questions
If you are ready, I would like you to start by introducing yourself, who you are, what you do at your company and perhaps what a typical day of yours looks like.

1. Coming back to today's subject, **how do you feel when you hear the words sustainability and design in the same sentence? What does it make you think of/reaction? How do you position the two, do you see any conflicts or agreements?**

2. There are multiple definitions of sustainability but I am interested in your definition. **What does sustainability mean to you (organisational and/or personally)? Is it a goal, is it a design requirement, how do you categorize it?**

3. Based on your definition, **what are some specific actions (tools, methods, etc.) *designers* can take to be more sustainable/act with that philosophy/reach that goal?**

4. Research shows that designers possess certain qualities that would make them ideal for addressing sustainability e.g., future foresighting, reframing, etc. Today, however, I am

ERVIEW GUIDE

curious to know, **are there any specific qualities like skills, knowledge, capabilities, etc. that designers need to better address sustainability?**

5. One other focus area of my study is **human-centred design**. There is discourse on the dilemma or conflict between human-centricity and sustainability. **How do you reflect on that and how does it emerge in your practice?**

6. You design products for your end customers and obviously, you would want them to have a good time with them; you want the products to be safe, delightful, and in general offer a good experience. However, sometimes it is not possible to check all the boxes. One example that comes to mind is paper straws, they are arguably more sustainable than plastic ones, but get soggy and unusable after a while. Not to mention the unwanted implications for disabled persons. **How do you ensure that such a compromise is not present in your design work?**

7. **Lastly, how can designers advocate for sustainability in their organizations while providing value for their stakeholders: customers, management, society, etc.?**

Next Steps
Do you have anything you would like to add?

Snowballing question: **Do you know anyone else who might be interested in doing an interview?**

Design phase: **Would you be interested in taking part in the testing of the developed concept?**

APPENDIX C. INTERVIEW INFORMED CONSENT FORM

Informed Consent Form - Ömer Taha Döver

1. **Participant Information**

You are being invited to participate in a research study titled "Empowering designers engaging with sustainability: A strategic approach to unleash design's potential". This study is being done by Ömer Taha Döver (Corresponding Researcher) and Dr. Giulia Calabretta (Responsible Researcher) from the TU Delft.

The purpose of this research study is to learn about designers' experiences addressing sustainability in their daily practice and will take you approximately 60 minutes to complete. The data (an audio-recorded interview, for the ease of collecting answers) will be used for transcription, coding, and analysis; the insights of which will be referred to in designing a strategic approach to be published as part of the Master's thesis. We will be asking you to elaborate on your attitudes, values, roles, and responsibilities regarding sustainability within your practice at your company.

As with any online activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by not asking any questions revealing personal information, not collecting IP addresses or other Personal Data. All data will be stored in a safe drive and disposed of at the end of the study. Transcriptions will be further anonymised and shared with participants for checks before coding and analysis.

Although the physical, emotional or reputational risks are low, your participation may feel out of courtesy to the researchers. In this study, your participation is entirely voluntary and you can withdraw at any time with no consequences. You are free to omit any questions. The audio recordings will be erased after the transcription and your identity will be kept anonymous.

There will not be any remuneration for time/compensation for travel.

Corresponding Researcher
Ömer Taha Döver (MSc. Student)
[redacted]

Responsible Researcher
Dr. Giulia Calabretta
[redacted]

2. Explicit Consent Points

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated 28/03/2024, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves: • An audio-recorded interview (for the ease of collecting answers) • A transcription as text of the interview recording • Disposal of the audio-recording	☐	☐
4. I understand that the study will end when enough saturation is reached in interviews.	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study involves the following risks of emotional coercion due to taking part in the study out of courtesy for the researchers. I understand that these will be mitigated by getting informed that I can withdraw from the study at any time, without having to give a reason and facing consequences.	☐	☐
6. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) (name, occupation, and contact details) with the potential risk of my identity being revealed.	☐	☐
7. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach: • Anonymous data collection • Anonymisation • Secure data storage • Transcription • Redaction • Disposal of data	☐	☐
8. I understand that personal information collected about me that can identify me, such as name, occupation, and contact details will not be shared beyond the study team.	☐	☐
9. I understand that the (identifiable) personal data I provide will be destroyed after I approve the transcription of my interview.	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
10. I understand that after the research study the de-identified information I provide will be used for designing a strategic approach to be published as part of the master's thesis.	☐	☐
11. I agree that my responses, views or other input can be quoted anonymously in research outputs.	☐	☐
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		
12. I give permission for the de-identified interview transcription that I provide to be archived in TU Delft repository so it can be used for future research and learning.	☐	☐

Signatures

_____ _____ _____

Name of participant [printed] Signature Date

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

_____ _____ _____

Name of witness [printed] Signature Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____ _____ _____

Researcher name [printed] Signature Date

Study contact details for further information: Ömer Taha Döver, [redacted]

APPENDIX D. INTE STRUCTURE

ATLAS.ti Report

Thesis Final

Code groups

Report created by Ömer Taha Döver on 9 May 2024

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approaches for sustainability

Members:

7R method • anti-sustainability • Bottom Up Approach • circular design • compromising convenience for sustainability • Cradle to Cradle Principle • design for disassembly • design thinking • designing adaptable experiences • developing good products • ESG Reporting • extended product lifetime • finding a starting point • Footprint Calculation • Framework on How to Measure Sustainability • Good recycle options • High level attachment of products • LCA • Leading by example • Product with low footprints • Profitability of Sustainability • Repairability index • role of governance • sustainable development goals • Triangulation of Different Aspects • Understanding resistance • Value Proposition • Win, win, win solutions

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barriers for sustainability

Members:

buzzwordification of sustainability • compromising on sustainability • convenince over sustainability • Defining how to measure sustainability as a success • not all projects prioritise sustainability • not everyone is familiar with sustainability • sustainability is not the priority

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definitions of sustainability

Members:

Energy consumption • holistic definition of sustainability • inclusivity and diversity as sustainability aspects • Making conscious choices • not having a clear definition for sustainability • sustainability as a design requirement • sustainability as an automatic response • sustainability as business continuation • systematic implications of sustainability • UN definition of sustainability

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designer shortcomings for sustainability

Members:

communication skills • critical skills • empathy as a soft skill • Impactful communication • Junior Designers Overestimating Influence • lack of actionable tools • Language of the stakeholder • naivete of designers • sustainability as unknown ground for designers • Understanding the data

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feelings towards design and sustainability

Members:

Conflict between Human Centered Design and Sustainability • everyone should focus on sustainability in a company • feeling conflicted on sustainability and design • feeling guilty • feeling optimistic on sustainability • Feeling Powerless • sustainability gives purpose to designers work

ERVIEW CODE

impact of design on sustainability

Members:
behaviour change • impact of design interventions • sustainability in progress

outsider outlook on the design profession

Members:
design as a polluting profession • design as a sustainability contributor

potential of design on sustainability

Members:
abilities of the designer • Behavior Change • the material part of sustainability

roles and obligations of designers

Members:
advocacy for sustainability • Aligning with other departments • balancing sustainability with other factors • changing traditional mindsets • convincing other people • creating urgency • Design as an Educator • designer as the educator • Designer knowledge • educating the customer • Getting the topic on the table as soon as possible • making sustainability tangible • Morally defend why sustainability is important • not tricking the customer • Priorities and your own values • responsibility of the designer • storytelling skills • Talking the language of the business • tangible outcome of sustainability • Teamwork • Technical skills

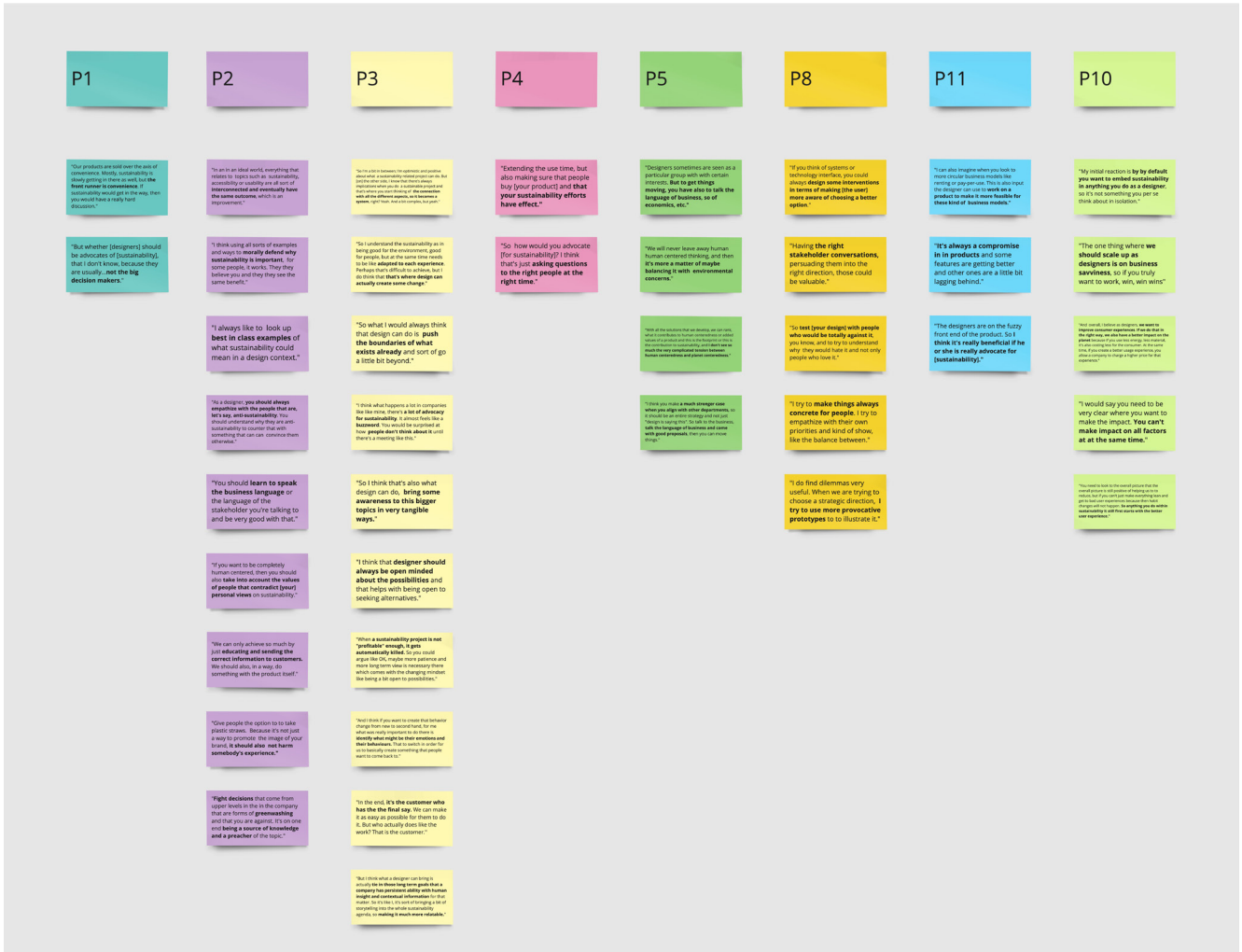
state of sustainability

Members:
convenience over sustainability • customer has the final say • Financial push for sustainability • Lack of Sustainability Manager • management prioritising sustainability • no conflict between sustainability and human centeredness • Regulatory aspects • Stakeholder Influence • sustainability vs profitability

sustainability as an integral part of design

Members:
integrating sustainability into design • sustainability intertwined with all parts of society • sustainable mindset change • Systematic Change

APPENDIX E. SELECTED QUOTES FROM INTERVIEWS

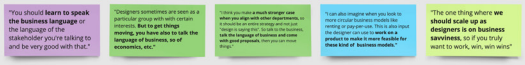


APPENDIX F. QUOTE CLUSTERS AND STATEMENTS

Designers are (usually) not the decision makers

User-centricity first

Speaking the business language is crucial



Your solution is only effective if people buy it

Designers can bring awareness via tangible ways

Sustainability is a complex, systemic issue

Design interventions are not yet holistic/integral

Designers can look at good examples for inspiration, but need to go beyond

Not everyone is passionate for sustainability

Nudging the customer is not enough

Advocate by asking the right questions, to the right people at the right time

APPENDIX G. INSI

Designers are not the decision makers

EXPLANATION

Advocate for sustainability, combat greenwashing in strategic decisions, educate customers, and emphasize responsible product use, but ultimately, the customer decides whether to purchase and use the product as intended.

STATEMENT 1

PARTICIPANT QUOTES

*"But whether [designers] should be advocates of [sustainability], that I don't know, because they are usually...**not the big decision makers.**"*

*"I think using all sorts of examples and ways to **morally defend why sustainability is important,** for some people, it works. They they believe you and they they see the same benefit."*

*"**Fight decisions** that come from upper levels in the in the company that are forms of **greenwashing** and that you are against. It's on one end **being a source of knowledge and a preacher of the topic.**"*

*"In the end, **it's the customer who has the the final say**. We can make it as easy as possible for them to do it. But who actually does like the work? That is the customer."*

User-centricity first

EXPLANATION

Strive for balance between convenience and sustainability to avoid compromising user experience. Ensure solutions prioritize both human-centeredness and environmental impact for effective behavior change.

STATEMENT 2

PARTICIPANT QUOTES

*"Our products are sold over the axis of convenience. Mostly, sustainability is slowly getting in there as well, but **the front runner is convenience**. If sustainability would get in the way, then you would have a really hard discussion."*

*"Give people the option to to take plastic straws. Because it's not just a way to promote the image of your brand, it **should also not harm somebody's experience.**"*

*"We will never leave away human human centered thinking, and then **it's more a matter of maybe balancing it with environmental concerns.**"*

*"With all the solutions that we develop, we can rank, what it contributes to human centeredness or added values of a product and this is the footprint or this is the contribution to sustainability, and **I don't see so much the very complicated tension between human centeredness and planet centeredness.**"*

*"And overall, I believe as designers, **we want to improve consumer experiences. If we do that in the right way, we also have a better impact on the planet** because if you use less energy, less material, it's also costing less for the consumer. At the same time, if you create a better usage experience, you allow a company to charge a higher price for that experience."*

*"You need to look to the overall picture that the overall picture is still positive of helping us to to reduce, but if you can't just make everything lean and get to bad user experiences because then habit changes will not happen. **So anything you do within sustainability it still first starts with the better user experience.**"*

GHT CARDS

Speaking the business language is crucial

EXPLANATION

Engage in sustainability as a group effort, align with other departments, communicate effectively, consider business models and innovations, and focus on personal improvement in those areas.

STATEMENT 3

PARTICIPANT QUOTES

*"You should **learn to speak the business language** or the language of the stakeholder you're talking to and be very good with that."*

*"Designers sometimes are seen as a particular group with with certain interests. **But to get things moving, you have also to talk the language of business, so of economics, etc."***

*"I think you make **a much stronger case when you align with other departments**, so it should be an entire strategy and not just "design is saying this". So talk to the business, **talk the language of business and come with good proposals**, then you can move things."*

*"I can also imagine when you look to more circular business models like renting or pay-per-use. This is also input the designer can use to **work on a product to make it more feasible for these kind of business models."***

*"The one thing where **we should scale up as designers is on business savviness**, so if you truly want to work, win, win wins"*

Your solution is only effective if people buy it

EXPLANATION

In the end, products have an impact when consumers purchase and use them. Design products with the goal of creating profitability to increase sales and scale their overall impact.

STATEMENT 4

PARTICIPANT QUOTES

*"Extending the use time, but also making sure that people buy [your product] and **that your sustainability efforts have effect."***

*"When **a sustainability project is not "profitable" enough, it gets automatically killed.** So you could argue like OK, maybe more patience and more long term view is necessary there which comes with the changing mindset like being a bit open to possibilities."*

Designers can bring awareness via tangible ways

EXPLANATION

Utilize tangible boundary objects to provoke and raise awareness of abstract issues effectively. Enhance the clarity of long-term goals by combining them with human insight and contextual information.

STATEMENT 5

PARTICIPANT QUOTES

"So I think that's also what design can do, ***bring some awareness to this bigger topics in very tangible ways.***"

"But I think what a designer can bring is actually ***tie in those long term goals that a company has persistent ability with human insight and contextual information*** *for that matter. So it's like I, it's sort of bringing a bit of storytelling into the whole sustainability agenda, so* ***making it much more relatable.***"

"I try to ***make things always concrete for people.*** *I try to empathize with their own priorities and kind of show, like the balance between."*

"I do find dilemmas very useful. When we are trying to choose a strategic direction, ***I try to use more provocative prototypes*** *to to illustrate it."*

Sustainability is a complex, systemic issue

EXPLANATION

Sustainability initiatives can create an impact, but it's crucial to consider all implications since these projects are complex, interconnected, and relate to various facets of the system.

STATEMENT 6

PARTICIPANT QUOTES

"So I'm a bit in between; I'm optimistic and positive about what a sustainability related project can do. But [on] the other side, I know that there's always implications when you do a sustainable project and that's where you start thinking of ***the connection with all the different aspects, so it becomes a system,*** *right? Yeah. And a bit complex, but yeah."*

Design interventions are not yet holistic/integral

EXPLANATION

Integrating sustainability into all design decisions is crucial, but this might lead to compromises on aspects like usability and accessibility.

STATEMENT 7

PARTICIPANT QUOTES

"In an in an ideal world, everything that relates to topics such as sustainability, accessibility or usability are all sort of ***interconnected and eventually have the same outcome****, which is an improvement."*

*"****It's always a compromise in in products*** *and some features are getting better and other ones are a little bit lagging behind."*

"My initial reaction is ***by default you want to embed sustainability in anything you do as a designer****, so it's not something you per se think about in isolation."*

"I would say you need to be very clear where you want to make the impact. ***You can't make impact on all factors at at the same time.****"*

Designers can look at good examples for inspiration, but need to go beyond

EXPLANATION

Designers are at the forefront of product development, and while reviewing other examples is beneficial, it should primarily serve as a benchmarking tool to surpass existing standards.

STATEMENT 8

PARTICIPANT QUOTES

"I always like to look up ***best in class examples*** *of what sustainability could mean in a design context."*

"So what I would always think that design can do is ***push the boundaries of what exists already*** *and sort of go a little bit beyond."*

"I think that ***designer should always be open minded about the possibilities*** *and that helps with being open to seeking alternatives."*

*"****The designers are on the fuzzy front end of the product****. So I think it's really beneficial if he or she is really advocate for [sustainability]."*

Not everyone is passionate for sustainability

EXPLANATION

Designers often find themselves as the primary advocates for sustainability. This situation is typical and can serve as a valuable opportunity to connect with individuals who may be apathetic or opposed to sustainability.

STATEMENT 9

PARTICIPANT QUOTES

*"As a designer, **you should always empathize with the people that are, let's say, anti-sustainability.** You should understand why they are anti-sustainability to counter that with something that can can convince them otherwise."*

*"If you want to be completely human centered, then you should also **take into account the values of people that contradict [your] personal views** on sustainability."*

*"So **test [your design] with people who would be totally against it**, you know, and to try to understand why they would hate it and not only people who love it."*

*"I think what happens a lot in companies like like mine, there's **a lot of advocacy for sustainability.** It almost feels like a buzzword. **You would be surprised at how people don't think about it** until there's a meeting like this."*

Nudging the customer is not enough

EXPLANATION

Guiding the users is a powerful strategy, yet for lasting success, the product itself needs to prioritize sustainability. Additionally, designers can leverage the emotional and behavioural traits of users to craft personalized experiences that can create impact.

STATEMENT 10

PARTICIPANT QUOTES

*"If you think of systems or technology interface, you could always **design some interventions in terms of making [the user] more aware of choosing a better option."***

*"We can only achieve so much by just **educating and sending the correct information to customers.** We should also, in a way, do something with the product itself."*

*"And I think if you want to create that behavior change from new to second hand, for me what was really important to do there is **identify what might be their emotions and their behaviours.** That to switch in order for us to basically create something that people want to come back to."*

*"So I understand the sustainability as in being good for the environment, good for people, but at the same time needs to be like **adapted to each experience.** Perhaps that's difficult to achieve, but I do think that **that's where design can actually create some change."***

Advocate by asking the right questions, to the right people at the right time

EXPLANATION

Engaging in meaningful discussions can make a lasting impact. Recognizing the priorities of key individuals can bring about significant transformations.

STATEMENT 11

PARTICIPANT QUOTES

*"So how would you advocate [for sustainability]? I think that's just **asking questions to the right people at the right time.**"*

*"Having **the right stakeholder conversations**, persuading them into the right direction, those could be valuable."*

APPENDIX H. STUDENT RECRUITMENT MESSAGE

Hello everyone! Are you a design student who finds themselves engaging with sustainability in their work? If yes, I am looking for you!

My name is Ömer and I am looking for co-creation participants for my graduation project on designer engagement with sustainability . The session will last 1 hour (during a lunch break) and will be mainly focused on generating problem statements and how might we questions. There will be refreshments.

If this is interesting to you, send me a DM and I will give you the details!

APPENDIX I. CO-CREATION SESSION PERSONAS

The role you are assigned is **Designer**, working in-house for a hypothetical company. Your hands are tied to address environmental sustainability matters in the design process and you are restrained by other priorities determined by management and policy even though it is established that individual behaviour change can be accomplished via designer effort. You feel like you can do more for sustainability if you had more skills, knowledge, and tools, but also strategic competencies and positions.

/

The role you are assigned is **Policymaker**, representing the government. You promote sustainable behaviour for individuals and companies through interventions and legislation. You are in charge of rules and regulations regarding sustainability which can significantly accelerate sustainable transformation, however, sometimes you receive backlash from individuals or companies if they are too restrictive.

/

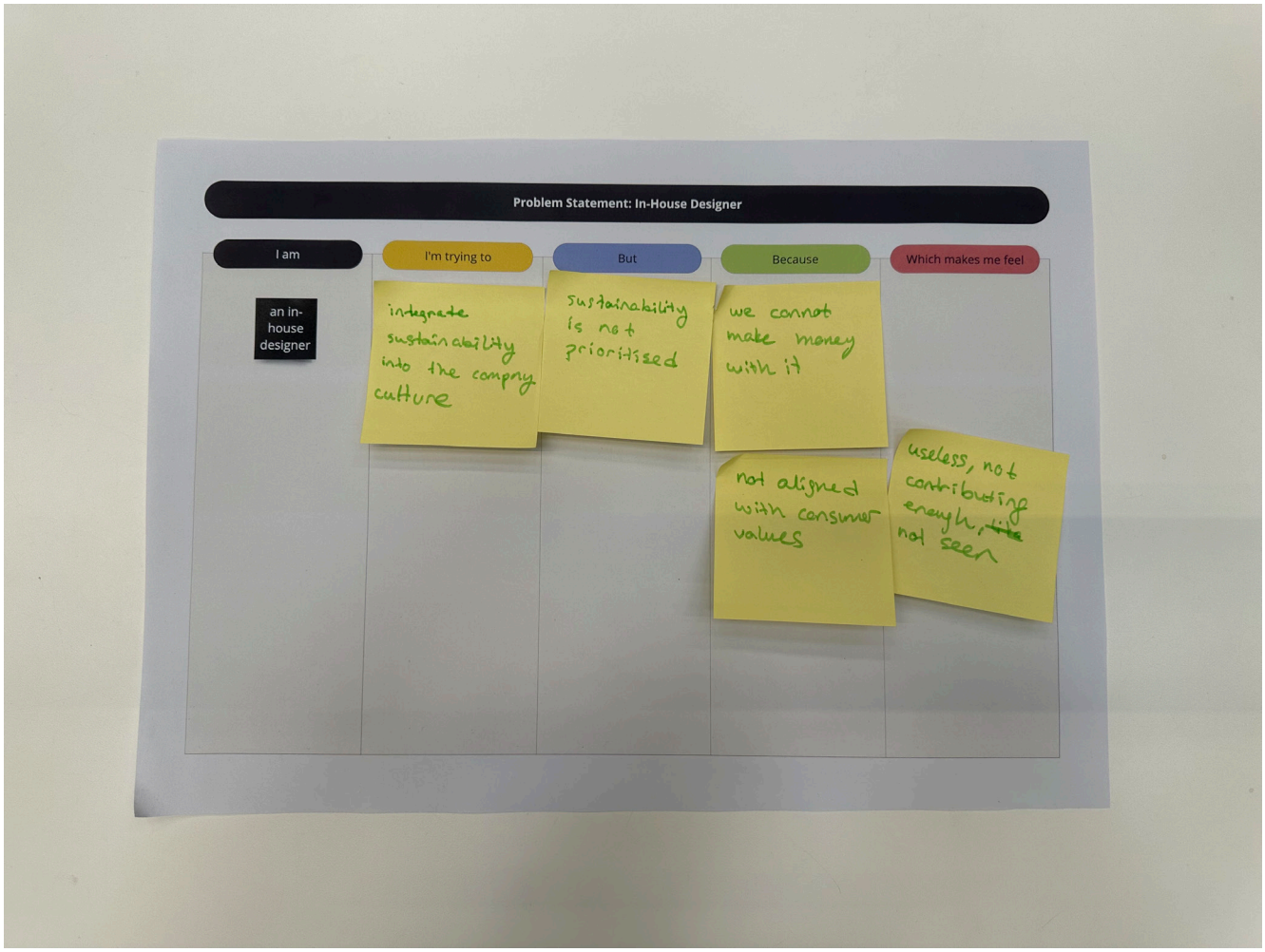
The role you are assigned is **Customer**, representing consumers. Sustainable behavior is promoted for you by governments but the effectiveness of this promotion in driving significant change is restricted. You sometimes feel like you are being blamed when being nudged to achieve a behavior change, whereas the responsibility should be established as a shared one between all players. You do not like it when your autonomy is compromised.

/

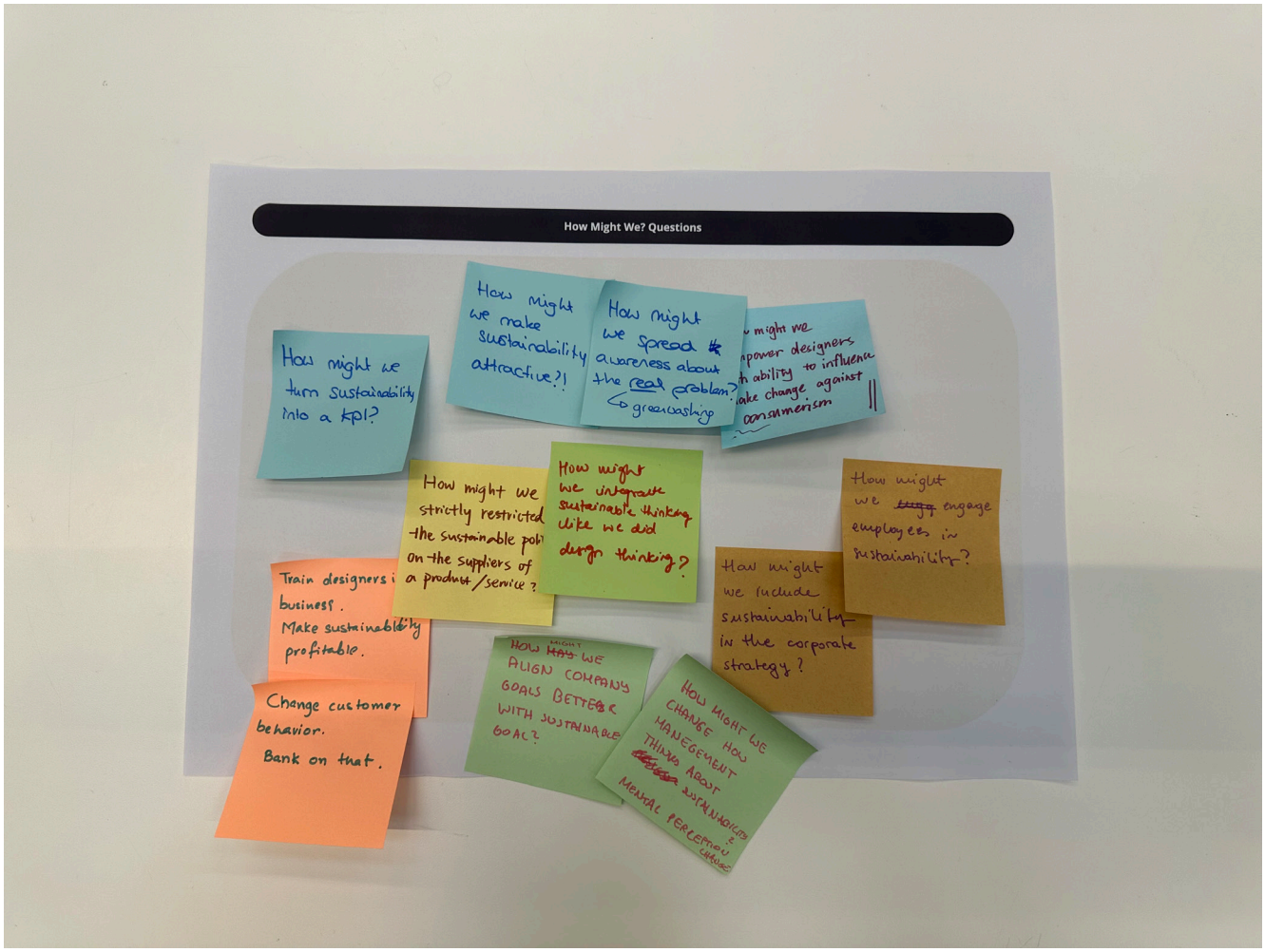
The role you are assigned is **Management**, representing a hypothetical company. You are in charge of making managerial decisions, determining priorities, and responding to demands from other functions like design. Furthermore, there is a call for you to utilize the company's inventive and creative skills to address sustainable development issues from organizations like the UN but you face challenges in enhancing your positive impact on the society and the environment.

APPENDIX J. EMPATHY MAP

APPENDIX K. PROBLEM STATEMENT



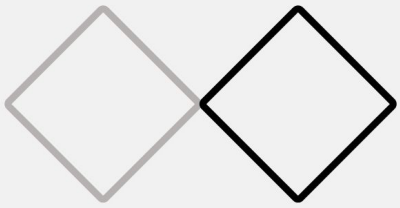
APPENDIX L. "HOW MIGHT WE?" QUESTIONS



APPENDIX M. BRAINWRITING

APPENDIX N. TAC
ABILTY CARDS (F

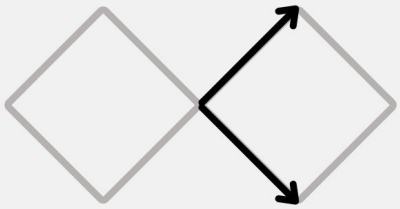
Introduction



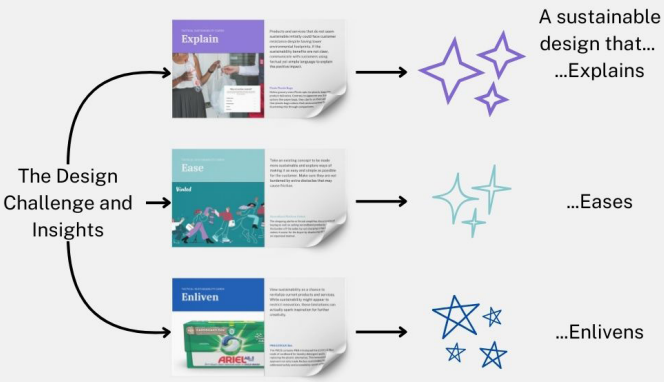
The Tactical Sustainability Cards are to be used during the “second diamond” of the Double Diamond design process (Design Council, 2015). This diamond comprises the “**Develop**” and “**Deliver**” steps. The cards can help in the Develop step to inspire and facilitate co-design, and in the Deliver step, help communicate the final concept.

A two-part workshop is devised to orchestrate a group of stakeholders. The goal in the first part is to make use of the examples to ideate as many concepts as possible aligned with the tactics. In the second part, one of the concepts and one of the tactics is selected to develop a communication strategy.

Workshop Design - Develop

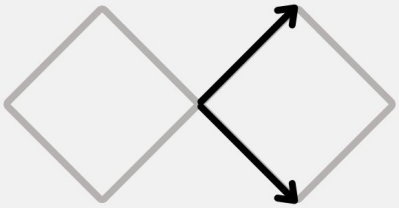


Based on the insights and the design challenge pre-defined in the first diamond, the participants are asked to start by establishing a goal for the session; this could be improving the customer experience, about defining the scope, etc. Later, they select a couple of cards, study them, and ideate one concept per card.

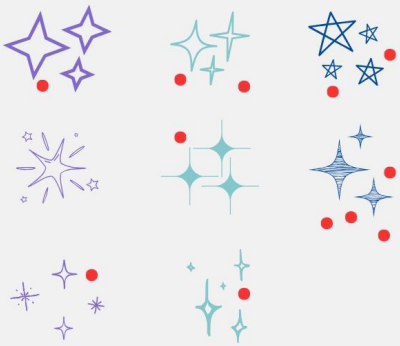


TICAL SUSTAIN-
INAL VERSION)

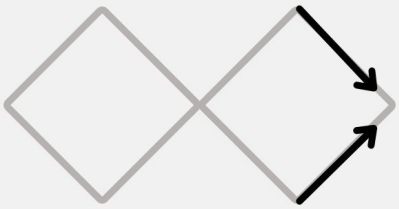
Workshop Design - Develop



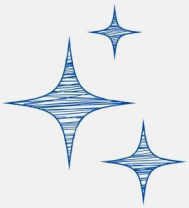
These concepts are then shared with the group and discussed. The key point is to observe the effect of the different tactics on the same design challenge.
One of the concepts is chosen via dot voting or other group decision making tool. Afterwards, the groups is asked to spend some time to further develop the concept using the Approaches and Models.



Workshop Design - Deliver



After the concept is fully developed, a communication strategy is designed based on the card that was used while creating the concept. The example on the card, again, could be a source of inspiration.

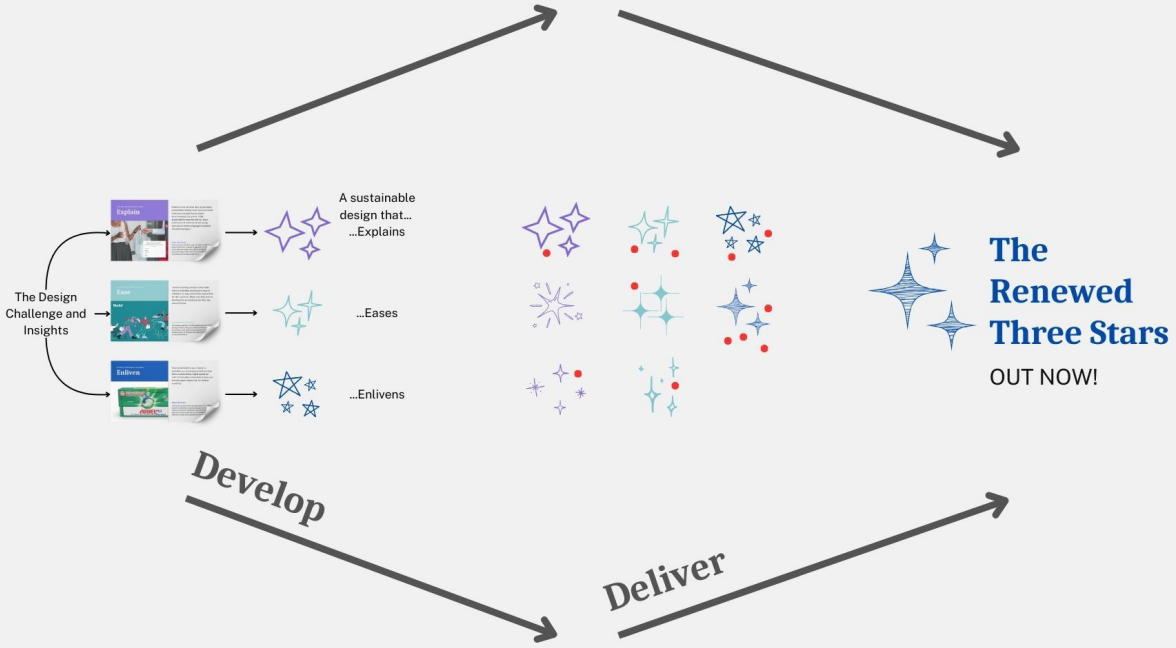


The Renewed Three Stars

OUT NOW!

WORKSHOP DESIGN - OVERVIEW

TACTICAL SUSTAINABILITY CARDS

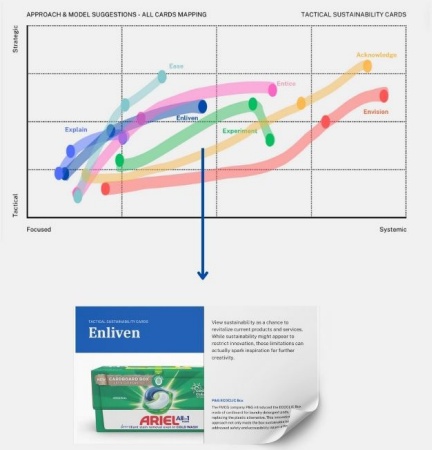


WORKSHOP DESIGN - ALTERNATIVE USE

TACTICAL SUSTAINABILITY CARDS

Workshop Design - Alternative Use

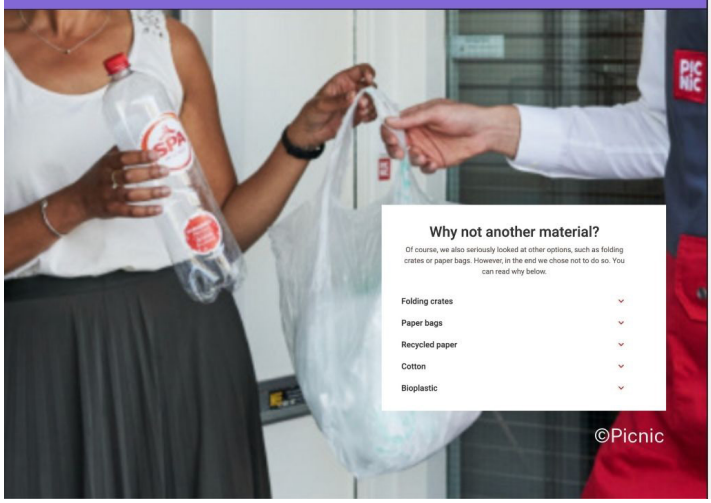
For higher-level contexts, the All Cards Mapping could be used. Here, depending on how Tactical, Strategic, Individual, or Systemic an intervention is desired to be, a corresponding card could be chosen directly.



TACTICAL SUSTAINABILITY CARDS

Explain

To give the reason for or cause of (Merriam-Webster, n.d.)



Products and services that do not seem sustainable initially could face customer resistance despite having lower environmental footprints. Communicate with customers using factual yet simple language to explain the positive impact. ***How can you clearly communicate hidden sustainability benefits to inspire customer trust and engagement?***

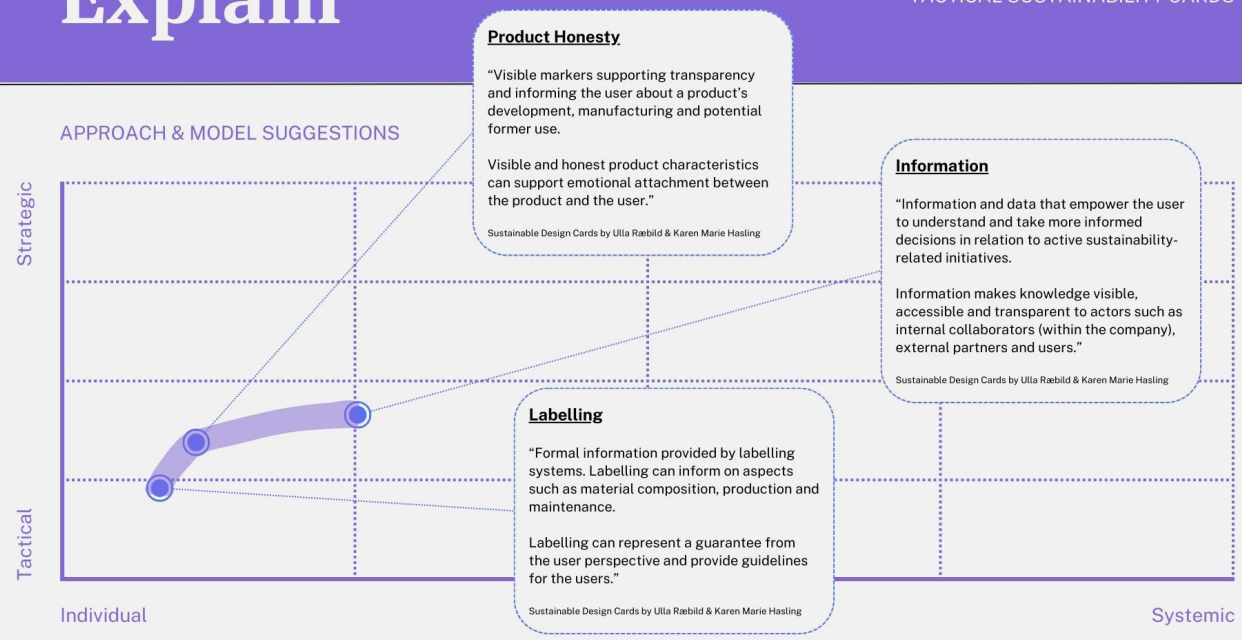
Picnic Plastic Bags

Online grocery store Picnic opts for plastic bags for product deliveries. Contrary to apparent eco-friendly options like paper bags, they clarify on their website that plastic bags reduce their environmental footprint, illustrating this through comparisons.

Explain

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



TACTICAL SUSTAINABILITY CARDS

Ease

To free from something that pains, disquiets, or burdens
(Merriam-Webster, n.d.)

Take an existing concept to be made more sustainable and explore ways of making it as easy and simple as possible for the customer. Make sure they are not burdened by extra obstacles that may cause friction.

How can you simplify a sustainable concept to ensure it is easy for customers to adopt without added friction?

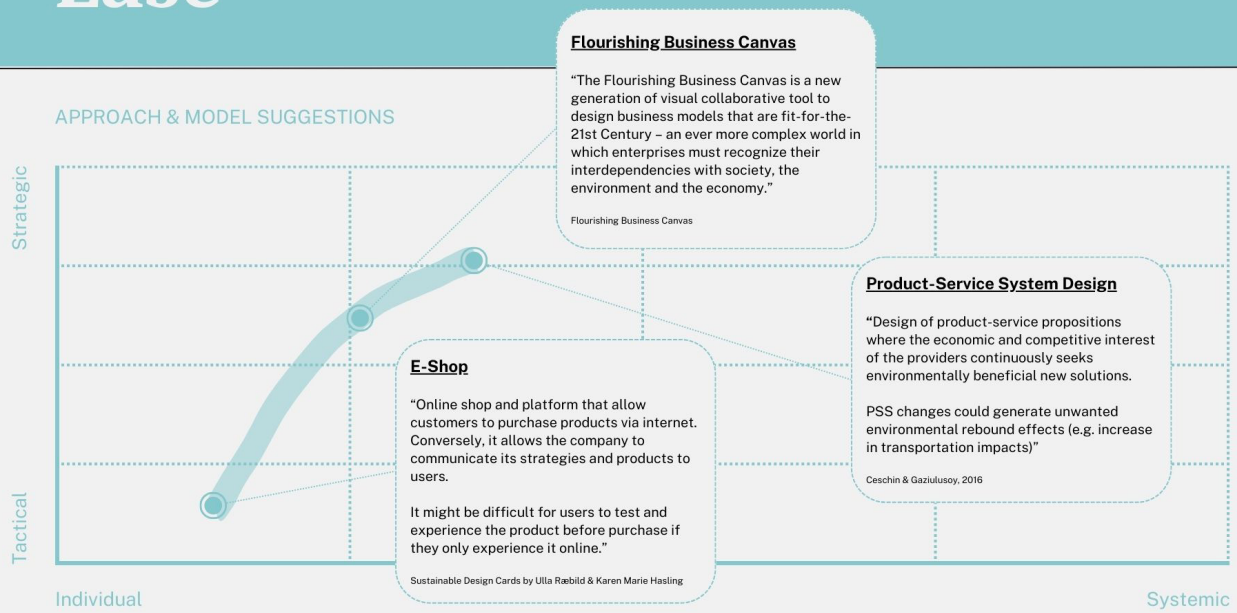
Secondhand Platform Vinted

The shopping platform Vinted simplifies the process of buying as well as selling secondhand products. It lifts the burden off the seller by not charging a fee and makes it easier for the buyer by displaying all options in an organised manner.

Ease

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



TACTICAL SUSTAINABILITY CARDS

Enliven

To give life, action, or spirit to (Merriam-Webster, n.d.)

©P&G

View sustainability as a chance to revitalize current products and services. While sustainability might appear to restrict innovation, these limitations can actually spark inspiration for further creativity.

How can you view sustainability as a chance to revitalize products, using its constraints to spark further creativity and innovation?

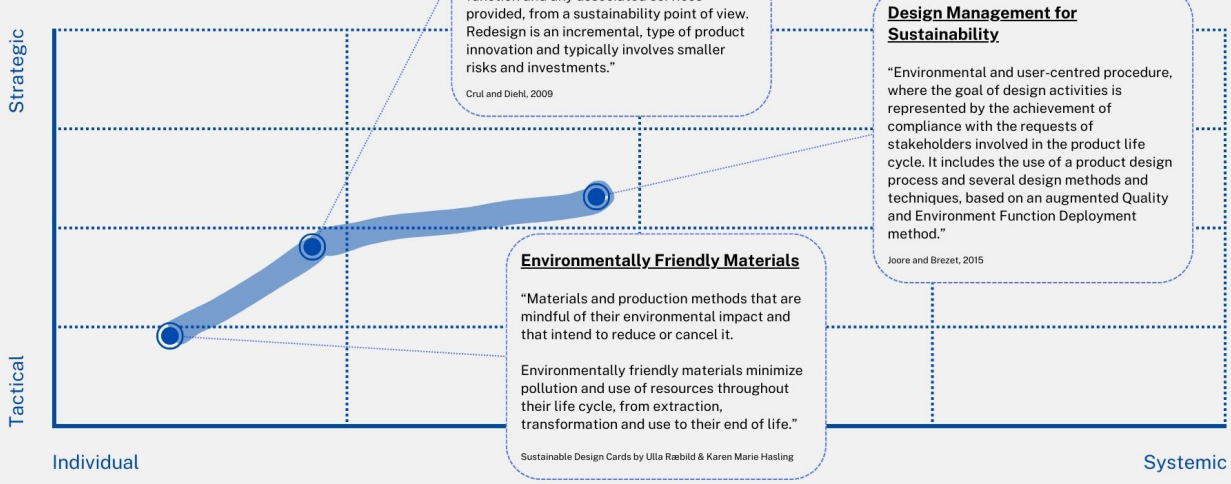
P&G ECOCLIC Box

The FMCG company P&G introduced the ECOCLIC Box made of cardboard for laundry detergent pods, replacing the plastic alternative. This innovative approach not only made the box sustainable but also addressed safety and accessibility issues effectively.

Enliven

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



Design for Sustainability: Redesign

"Structured, step-wise approach for redesign for sustainability. D4S Redesign aims at redesigning an existing product made by a company, including its primary function and any associated services provided, from a sustainability point of view. Redesign is an incremental, type of product innovation and typically involves smaller risks and investments."

Crul and Diehl, 2009

Design Management for Sustainability

"Environmental and user-centred procedure, where the goal of design activities is represented by the achievement of compliance with the requests of stakeholders involved in the product life cycle. It includes the use of a product design process and several design methods and techniques, based on an augmented Quality and Environment Function Deployment method."

Joore and Brezet, 2015

Environmentally Friendly Materials

"Materials and production methods that are mindful of their environmental impact and that intend to reduce or cancel it.

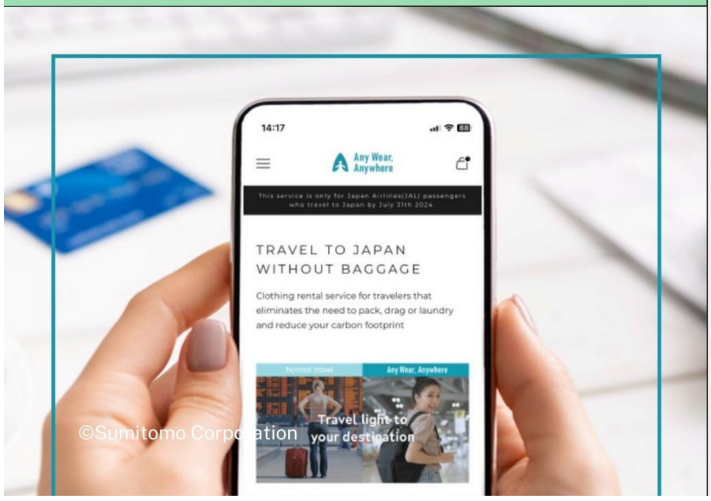
Environmentally friendly materials minimize pollution and use of resources throughout their life cycle, from extraction, transformation and use to their end of life."

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

TACTICAL SUSTAINABILITY CARDS

Experiment

To carry out experiments : try out a new procedure, idea, or activity (Merriam-Webster, n.d.)



Sustainable interventions do not need to be large or permanent right from the start. You can experiment with small-scale or short-term pilots to calculate the impact and customer response accurately before committing to a permanent solution.

How can you use small-scale, short-term sustainable pilots to gauge impact and customer response?

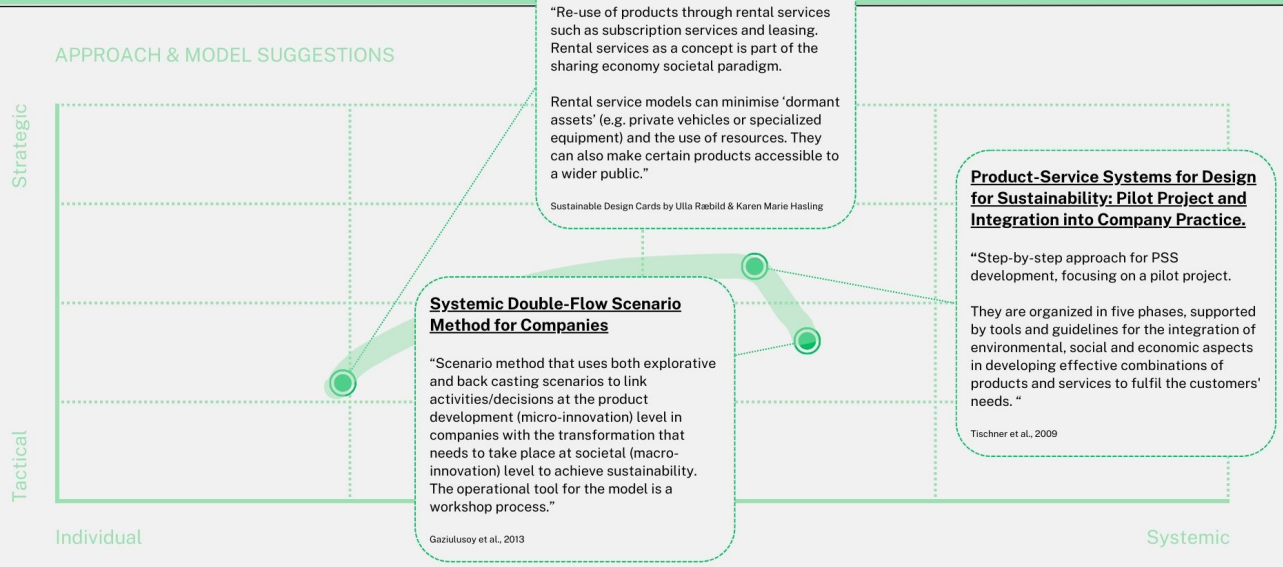
Any Wear, Anywhere

Sumitomo Corporation and Japan Airlines partnered on the Any Wear, Anywhere service for passengers to rent clothing at their destination, aiming to reduce luggage weight, fuel consumption, and CO2 emissions. The service is in a trial phase through 2024.

Experiment

TACTICAL SUSTAINABILITY CARDS

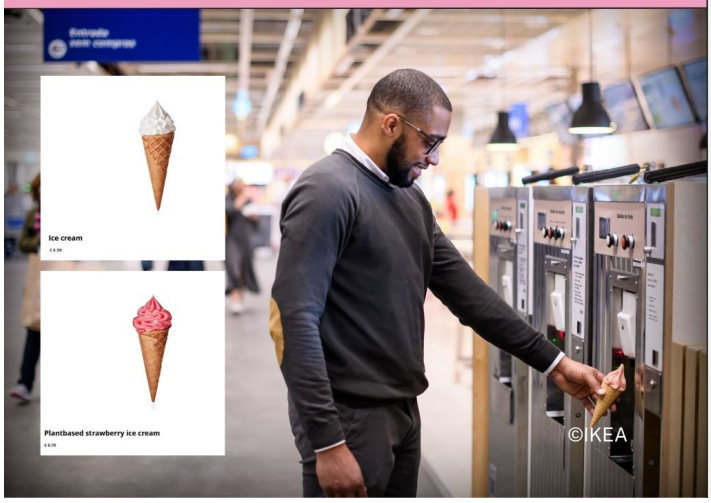
APPROACH & MODEL SUGGESTIONS



TACTICAL SUSTAINABILITY CARDS

Entice

To attract artfully or adroitly or by arousing hope or desire (Merriam-Webster, n.d.)



Introduce something fresh and appealing to encourage customers to adopt more sustainable behaviours. If the new product is not a direct substitute, attract customers with a new experience or value proposition.

How can you introduce fresh, appealing products to encourage sustainable customer behaviors through new experiences or value propositions?

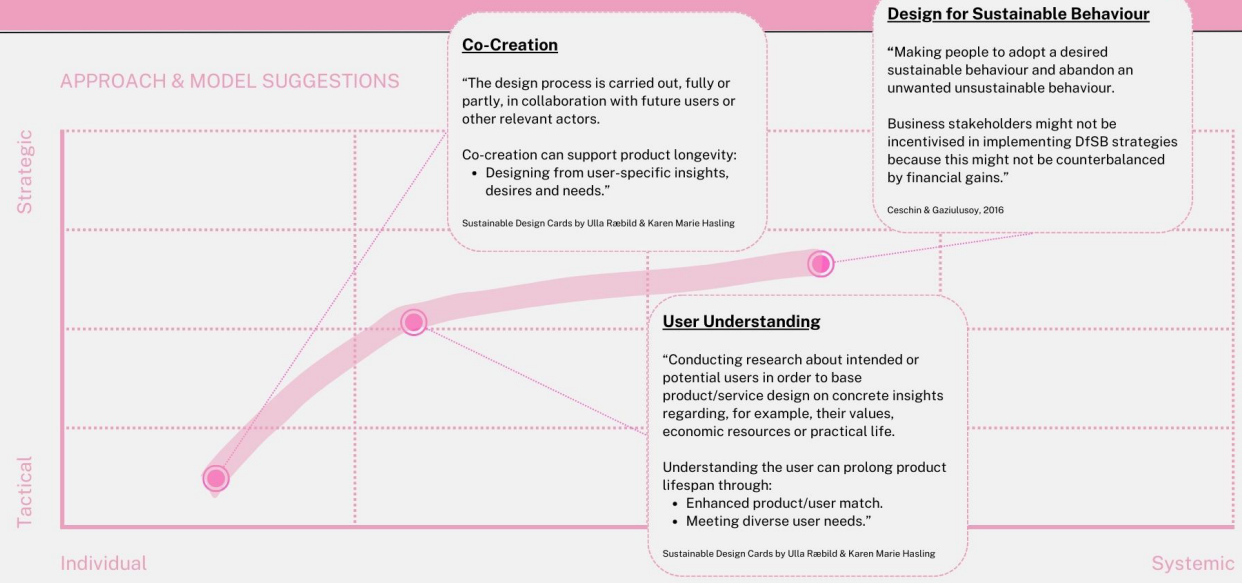
IKEA Plant-Based Ice Cream

The furniture giant, IKEA now provides plant-based ice cream alongside dairy options. This version comes in a new alluring strawberry flavour, and is offered at a lower price, making it even more appealing to customers.

Entice

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



TACTICAL SUSTAINABILITY CARDS

Envision

To picture to oneself (Merriam-Webster, n.d.)

Some interventions can result in a dramatic change in existing systems and conventions. Feel free to envision new structures that challenge the status quo.

How can you envision new structures that challenge the established norms to bring about significant change?

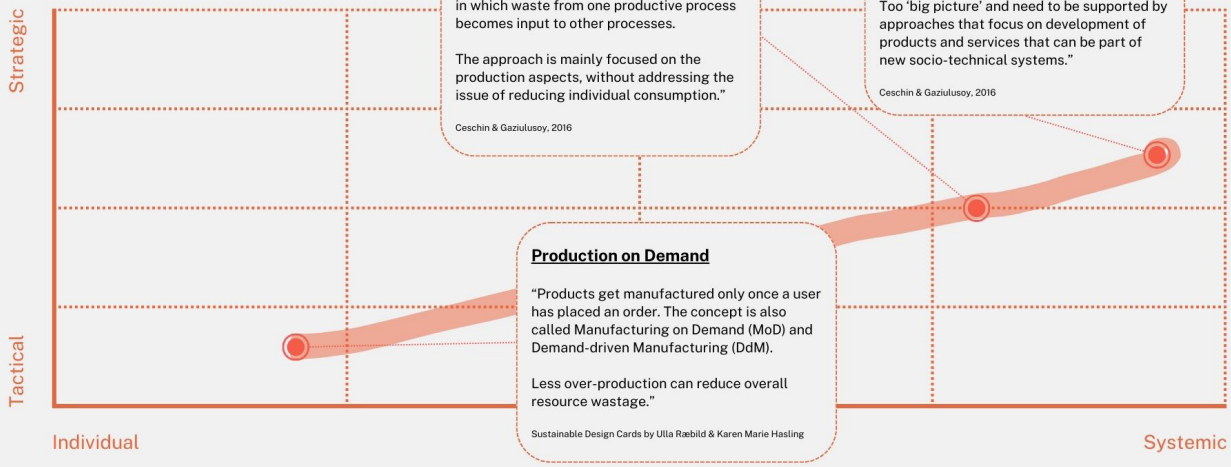
Too Good To Go

The service enables users to “rescue” food items by allowing businesses to offer surplus items at affordable prices, disrupting the traditional linear food industry system.

Envision

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



Systemic Design

“Designing locally-based productive systems in which waste from one productive process becomes input to other processes.

The approach is mainly focused on the production aspects, without addressing the issue of reducing individual consumption.”

Ceschin & Gaziulusoy, 2016

Design for System Innovations and Transitions

“Transformation of socio-technical systems through (strategic) design.

Too ‘big picture’ and need to be supported by approaches that focus on development of products and services that can be part of new socio-technical systems.”

Ceschin & Gaziulusoy, 2016

Production on Demand

“Products get manufactured only once a user has placed an order. The concept is also called Manufacturing on Demand (MoD) and Demand-driven Manufacturing (DdM).

Less over-production can reduce overall resource wastage.”

Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

TACTICAL SUSTAINABILITY CARDS

Acknowledge

To disclose knowledge of or agreement with
(Merriam-Webster, n.d.)

Take some getting used to...

Sustainability is a complex and systemic issue with many blind spots and unknowns. Be honest with any weaknesses and take responsibility for understanding and addressing potential customer concerns.

How can you design with honesty and responsibility, addressing sustainability's complexities and customer concerns?

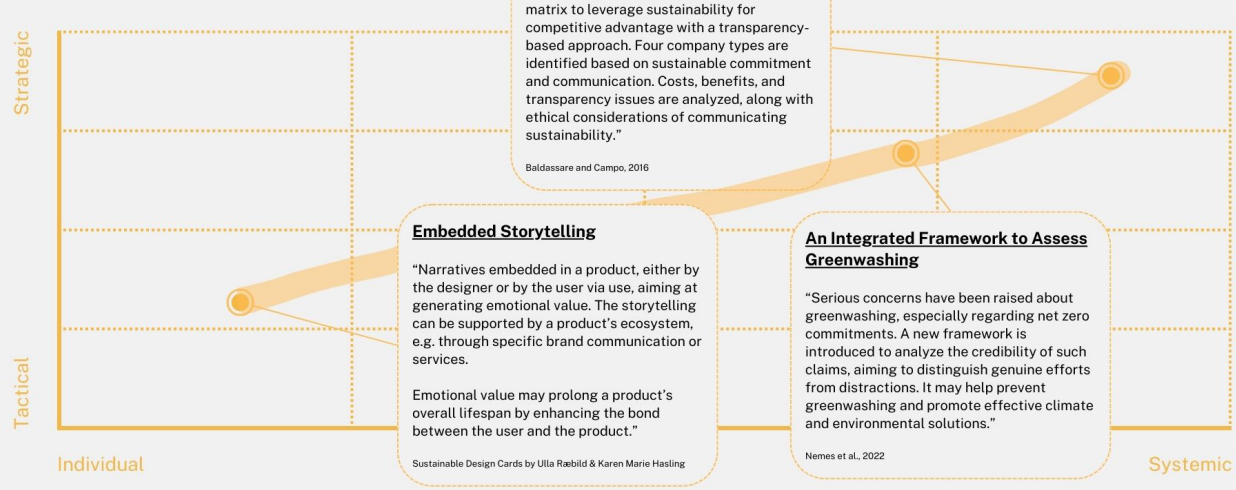
McDonald's Reusable Packaging

Following the EU Single-Use Plastic Directive, McDonald's switched to reusable packaging options. Their messaging emphasizes that the transition may require some adjustment and requests the cooperation of customers.

Acknowledge

TACTICAL SUSTAINABILITY CARDS

APPROACH & MODEL SUGGESTIONS



A Self-Assessment Tool for Sustainable Initiative Transparency

"The authors introduce a self-assessment matrix to leverage sustainability for competitive advantage with a transparency-based approach. Four company types are identified based on sustainable commitment and communication. Costs, benefits, and transparency issues are analyzed, along with ethical considerations of communicating sustainability."

Baldassare and Campo, 2016

Embedded Storytelling

"Narratives embedded in a product, either by the designer or by the user via use, aiming at generating emotional value. The storytelling can be supported by a product's ecosystem, e.g. through specific brand communication or services.

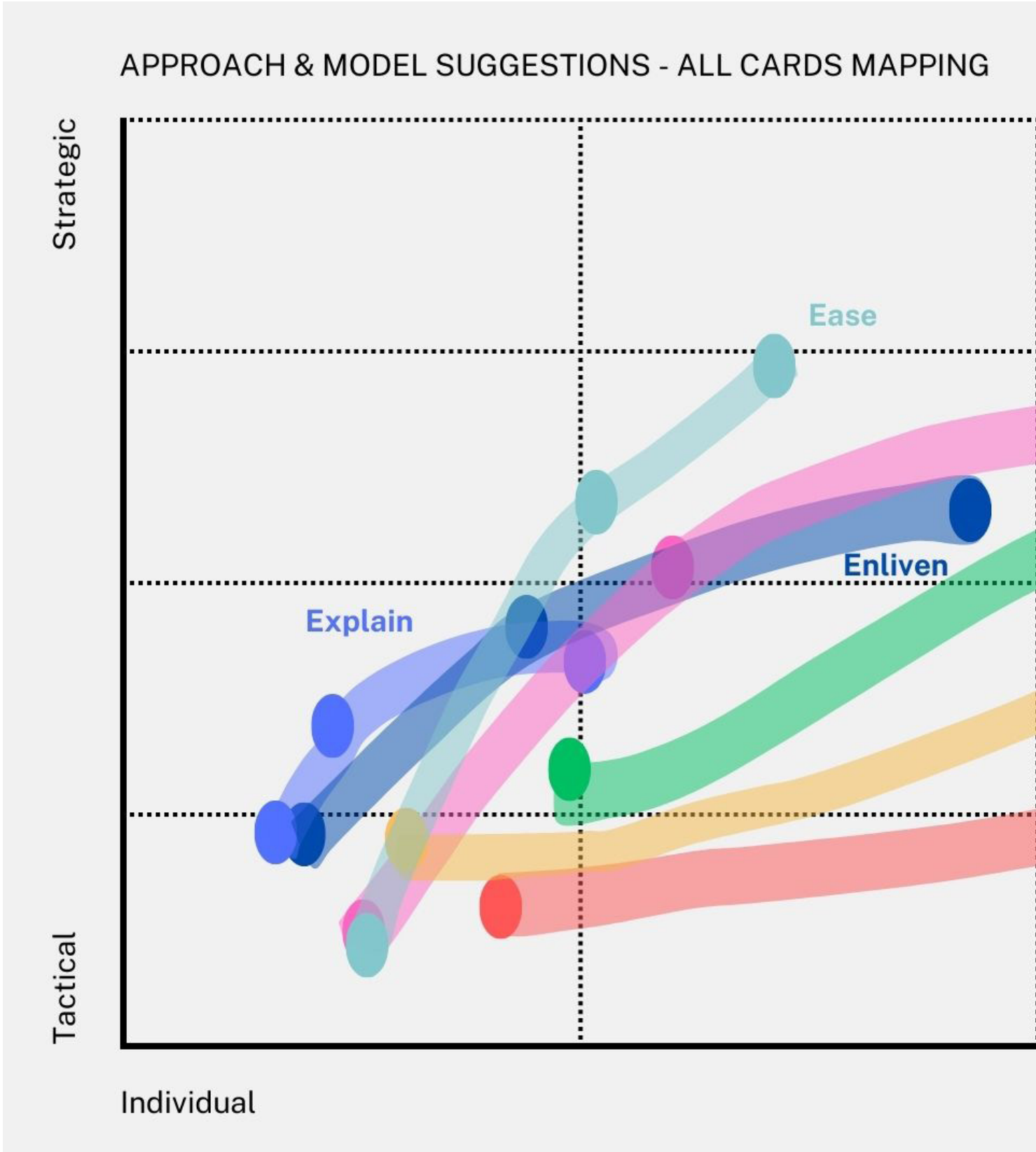
Emotional value may prolong a product's overall lifespan by enhancing the bond between the user and the product."

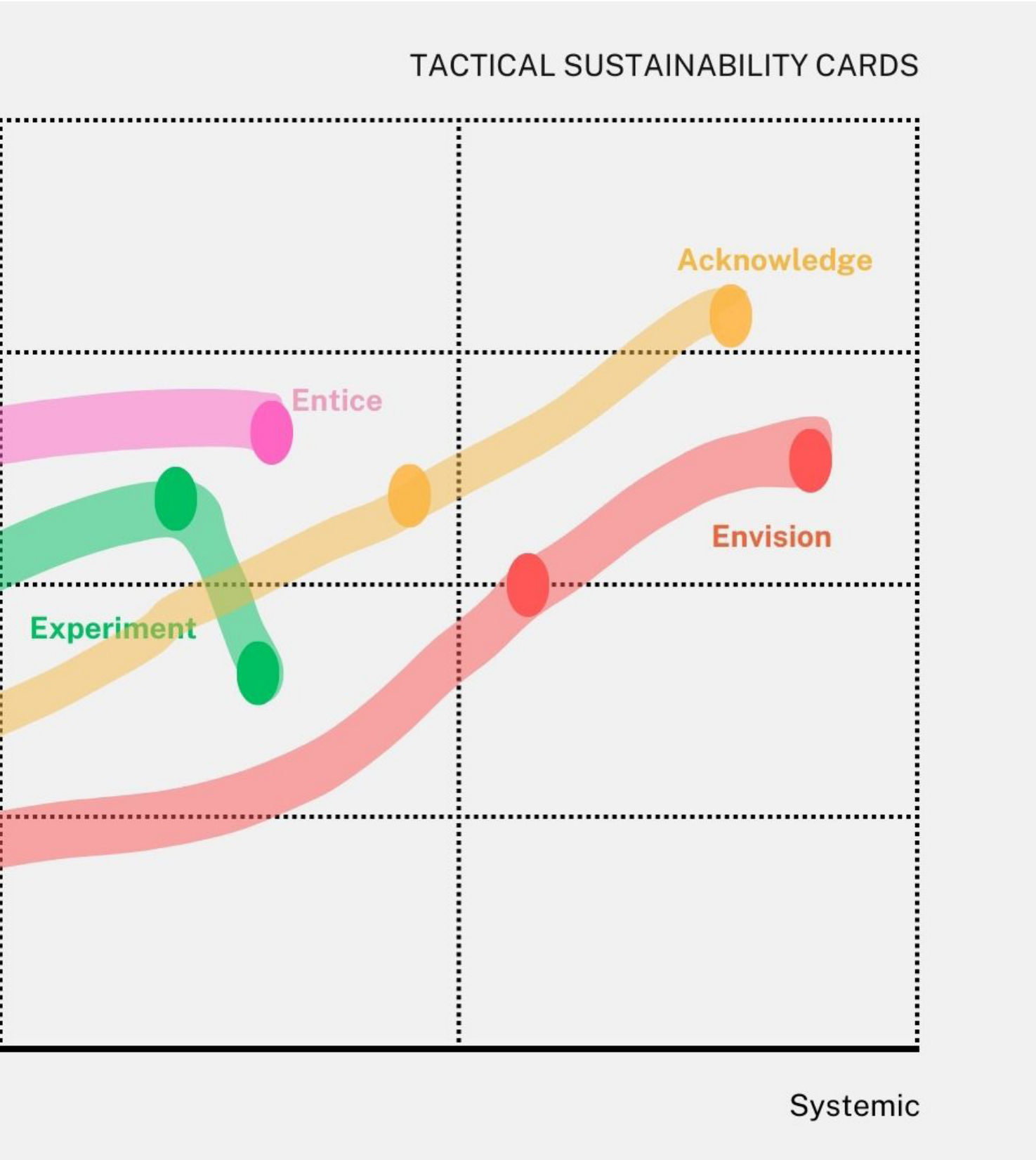
Sustainable Design Cards by Ulla Ræbild & Karen Marie Hasling

An Integrated Framework to Assess Greenwashing

"Serious concerns have been raised about greenwashing, especially regarding net zero commitments. A new framework is introduced to analyze the credibility of such claims, aiming to distinguish genuine efforts from distractions. It may help prevent greenwashing and promote effective climate and environmental solutions."

Nemes et al., 2022


APPROACH & MODEL SUGGESTIONS - ALL CARDS MAPPING
Strategic
Tactical
Individual
Ease
Enliven
Explain


TACTICAL SUSTAINABILITY CARDS
Acknowledge
Entice
Envision
Experiment
Systemic

APPENDIX O. PRO

DESIGN FOR our future

TU Delft

IDE Master Graduation Project

Project team, procedural checks and Personal Project Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

STUDENT DATA & MASTER PROGRAMME

Complete all fields and indicate which master(s) you are in

Family name	Döver
Initials	ÖT
Given name	[redacted]
Student number	[redacted]

IDE master(s)	IPD ☐ DfI ☐ SPD ✔
2nd non-IDE master	
Individual programme *(date of approval)*	
Medisign	☐
HPM	☐

SUPERVISORY TEAM

Fill in he required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

Chair	Giulia Calabretta	dept./section	DOS/MOD
mentor	Shahrokh Nikou	dept./section	DOS/RMCB
2nd mentor			
client:			
city:		country:	
optional comments			

! Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.

! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.

! 2nd mentor only applies when a client is involved.

APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in **by the Chair** of the supervisory team

Sign for approval (Chair)

Name Giulia Calabretta Date 06/03/2024 Signature [redacted]

OJECT BRIEF

CHECK ON STUDY PROGRESS

To be filled in **by SSC E&SA** (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total _____ EC

Of which, taking conditional requirements into account, can be part of the exam programme _____ EC

★	**YES**	all 1st year master courses passed
	NO	missing 1st year courses

Comments:

Sign for approval (SSC E&SA)

Name [redacted] Date 11-03-2024 Signature

APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

YES	★	Supervisory Team approved
NO		Supervisory Team not approved

Comments:

Based on study progress, students is ...

★	**ALLOWED** to start the graduation project
	NOT allowed to start the graduation project

Comments:

Sign for approval (BoEx)

Name [redacted] Date 12/3/2024 Signature

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Personal Project Brief – IDE Master Graduation Project

Name student Ömer Taha Döver **Student number** [redacted]

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT
Complete all fields, keep information clear, specific and concise

Project title Unearthing the potential of designers engaging with sustainability: A strategic approach

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

Design (and designers) have been considered contributors to environmental deterioration (Papanek, 1971) more recently and conversely, also as enablers of sustainable development (Thatcher, 2012).
In this study, how designers engage with sustainability issues in small to medium companies in the Netherlands is investigated. Although sustainability can be addressed at the systemic level, for this study the product-service system level and below is considered as this level can challenge the three aspects of customer behaviour, organizational structure, and regulations (Figure 1; Ceschin & Gaziulusoy, 2016). Designers at this level may have latent needs and barriers in engaging with sustainability issues such as obtaining a systemic approach (Dewberry et al., 2013), and challenges with testing and implementing (Vezzoli et al., 2015). The organisational stakeholders may be under pressure from regulations, society at large, etc. to be more sustainable yet have the existential drive to be profitable. Tapping into the potential of designers to facilitate the coexistence of both may be at stake. For the academic community, there is a gap to be filled in how designers engage with sustainability and a lack of a strategic approach based on practice (Figure 2; Mejía et al., 2022).
Unleashing the potential of designers comprises an opportunity for designers to be better prepared when facing a sustainability challenge, although they may still need more wisdom. For organisational stakeholders, having the existing potential of designers unearthed can bring many opportunities, financial or otherwise, while still needing means to have the designers' voices heard in the organisation.

References

Ceschin, F., & Gaziulusoy, I. (2016). Evolution of design for sustainability: From product design to design for system innovations and Transitions. Design Studies, 47, 118–163. https://doi.org/10.1016/j.destud.2016.09.002
Dewberry, E., Cook, M., Angus, A., Gottberg, A., & Longhurst, P. (2013). Critical reflections on designing product service systems. The Design Journal, 16(4), 408e430.
Mejía, G. M., Fischer, D., Silver, J., Xie, Y., & Fehler, M. (2022). How do professional designers engage with sustainability a systematic literature review. J. of Design Research, 20(4), 297–317. https://doi.org/10.1504/jdr.2022.132060
Papanek, V. (1971). Design for the real world. Thames & Hudson Ltd.

➔ *space available for images / figures on next page*

introduction (continued): space for images

click to add picture

image / figure 1 DfS approaches in four innovation levels, with focus area highlighted (adpt. Ceschin and Gaziulusoy, 2016)

image / figure 2 Theoretical framework on the need for a strategic apporach for designers in sust. (adpt. Mejía et

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Personal Project Brief – IDE Master Graduation Project

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.
(max 200 words)

Looking at the literature, it is evident that designers possess the capabilities to contribute to sustainable development and that they do engage with sustainability, yet exactly how they are doing that in practice is not thoroughly investigated. There are not enough comprehensive actionable guidelines, toolkits, or methods for designers to not only aid them in their encounters with such issues but also in how to communicate and influence company-wide strategies and decisions. This research targets this gap by incorporating more first-hand resources and hands-on research/design methods. With these methods, I foresee creating a more realistic and intuitive mode of tackling sustainability challenges due to this intimate and authentic research process. Additionally, this research could contribute to academia by building a practice-focused base that targets designers' engagement with sustainability.
Sustainability is at risk of becoming a buzzword and I would like to contribute to solving this problem within the context of design and designers in particular. There seems to be confusion and misinformation around this topic which I believe can lead to haphazard decision-making and less-than-ideal product/service offerings.

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

Design a strategic approach to improve the process of addressing sustainability challenges for designers in companies in the Netherlands offering product and product-service system level innovation

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

The project will start with a literature review phase in which sources from sustainability, design, and management literature will be investigated. Following the writing of the review, initial interviews will take place with designers or design practitioners of the aforementioned companies, namely small and medium sized enterprises as they form the majority of businesses in the Netherlands (KVK, n.d.) and provide an ample sample size. The interviews will aim to target latent needs and apparent barriers designers face when addressing sustainability challenges. A phase of transcribing, coding, and analysis will take place afterwards. Up until now, this will be the research stage. Following this stage will be the design stage which comprises the conventional ideation, prototyping, testing, and iteration steps. The steps following ideation will be organised in a co-design manner with the interviewed designers, if possible. Lastly, one concept of a tool + implementation strategy will be finalized and packaged that can be directly used and implemented in a company similar to those investigated in this project.

References

Netherlands Chamber of Commerce (KVK). (n.d.). What is an SME?. business.gov.nl. https://business.gov.nl/starting-your-business/first-steps-for-setting-up-your-business/what-is-an-sme/

Project planning and key moments

*To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting**, **mid-term evaluation meeting**, **green light meeting** and **graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).*

Make sure to attach the full plan to this project brief.
The four key moment dates must be filled in below

Kick off meeting	19.02.2024
Mid-term evaluation	16.04.2024
Green light meeting	14.06.2024
Graduation ceremony	12.07.2024

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	
For how many project weeks	
Number of project days per week	

Comments:

Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.
(200 words max)

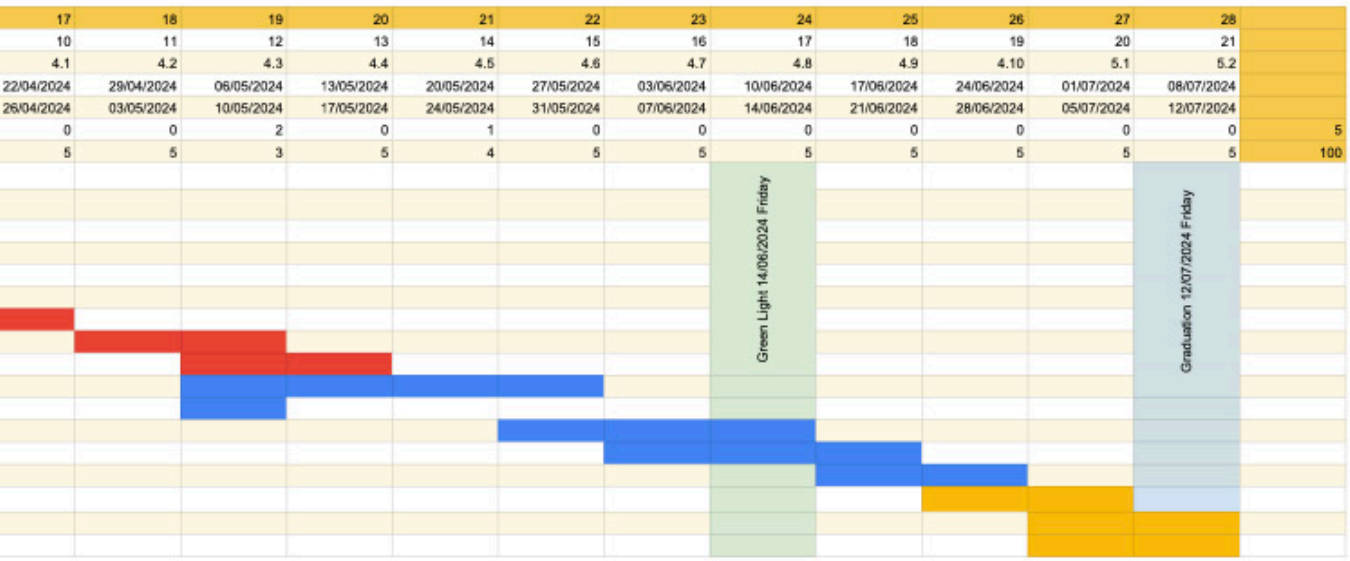
This project stems from a very personal place. Living in the Netherlands as an international student, I have observed certain sustainability practices, some I appreciated and some I criticised. Given how easy it is to deliberate, I am genuinely curious about dissecting the design decisions behind these practices and how they relate to my practice. I see myself as a stakeholder with personal and academic interests at stake. Sustainability is a pressing issue with substantial evidence. It is one of the factors design should consider when creating new value propositions. However, there are other factors at play as well; I am interested in the interplay and the balancing act between them.
Furthermore, I would like to showcase my research and research-based design competencies. I am intrigued by how design can be informed by insights rooted in research findings. This is also a personal learning ambition of mine, I would like to improve my skills in qualitative research, specifically interviewing. Although I have some experience, I feel like more practice would help me achieve a sufficient level of proficiency. I specifically want to gain insight into who to interview and what to ask them to get what I am looking for.

Thesis Planning Gantt Chart

	Calendar Week	8	9	10	11	12	13	14	15	16
	Project Week	1	2	3	4	5	6	7	8	9
	Teaching Week	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10
	Week Start Date	19/02/2024	26/02/2024	04/03/2024	11/03/2024	18/03/2024	25/03/2024	01/04/2024	08/04/2024	15/04/2024
	Week End Date	23/02/2024	01/03/2024	08/03/2024	15/03/2024	22/03/2024	29/03/2024	05/04/2024	12/04/2024	19/04/2024
	Off Days	0	0	0	0	0	1	1	0	0
	Working Days	5	5	5	5	5	4	4	5	5
Preparation	HREC									
Research	Literature Review									
	Literature Review Write-Up									
	Desk Research									
	Reaching Out to Interviewees									
	Interview Preparation									
	Conducting Interviews									
	Transcribing, Coding, Analysis									
	Interview Write-Up									
Design	Ideation									
	Arrange Co-Design Sessions									
	Prototyping									
	Testing									
	Iteration									
Finale	Report									
	Showcase									
	Appendices									

Kick-off 19/02/2024 Monday

Midterm 16/04/2024Tuesday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Green Light 14/06/2024 Friday
Graduation 12/07/2024 Friday