Mette Juhl Rasmussen - AAU CPH - spring 2019
Master's thesis – supervision: Stine Ejsing-Duun

THE SWEET SPOT FOR DESIGN THINKING

A study on how Design Thinking
can be implemented and used
by consultants in NNIT

SYNOPSIS SCHEME

INFORMATION STUDIES - MASTER'S THESIS

PROJECT TITLE: "The sweet spot for Design Thinking – a study on how Design Thinking can be implemented and used by consultants in NNIT"

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SEMESTER:	10th
DATE OF DELIVERY:	May 29, 2019
CHARACTERS:	133,477
NUMBER OF PAGES:	55.6

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Abstract. During the past decade, the term Design Thinking has gained a lot of attention within contexts beyond the traditional preoccupations of designers. Many organizations have already implemented designerly approaches to problem-solving in innovation processes, however, only few empirical studies have been conducted on the use of these approaches in an organizational context. This master's thesis examines how Design Thinking can be implemented and used by consultants in an organization, NNIT, and how a new approach to problem-solving can fit into their already existing practices. Research was carried out based on a qualitative, pragmatic inquiry, and results from the study show that three elements are instrumental for enabling the consultants to implement and use Design Thinking as a part of their future work practices. First, the managers should show their support and clearly define the purposes for implementing Design Thinking. Furthermore, the managers need to specify both how and when the consultants should use it and allocate dedicated time in the consultants' schedules for learning and implementing the approach. Secondly, the consultants need a shared repertoire and knowledge about the contents of Design Thinking, which will also be an aid in convincing clients about the positive implications of utilizing designerly problem-solving. Thirdly, the organization needs to accommodate the iterative nature of the process and to phase out the current culture about moving too fast to "solution mode". However, the results indicate that there is not one definite solution to the identified problem which in fact makes it a wicked problem. Therefore, further ethnographic research is needed to gain further insights into the consultants' practices, collect design knowledge, and to pinpoint the sweet spot for Design Thinking.

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ACKNOWLEDGEMENTS

I would like to thank my colleagues in NNIT Digital Together for dedicating their time to participate in my research and providing valuable insights for my thesis.

I submit my sincerest gratitude to my thesis supervisor, Associate Professor Stine Ejsing-Duun, for her expert guidance, bookish reflections, and positive encouragements throughout the process. Your skilled supervision very valuable for me.

I would like to dedicate a heartfelt thank you to my loving family, whose financial support and cherished compassion enabled me to complete my thesis while always believing in myself.

I gratefully extend a thank you to all the teachers in the Information Studies master's program and especially to my previous supervisor for three semesters, Lector Toine Bogers, for his invaluable guidance and dedication to the program.

I deeply appreciate the co-operation with my fellow students; Camilla, Sheila, and Alexandra. Your competent academic as well as emotional support made the whole process a lot more fun.

Finally, I would like to extend a great thank you to all friends and associates who have been instrumental in getting this thesis to completion.

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1. INTRODUCTION

Being innovative and successful in the 21st century's highly technological and globally competitive world requires companies to use a different set of skills than what was needed before (Shute & Becker, 2010). As a possible result hereof, established companies have started applying designers' problem solving-methods to corporate innovation processes, to which specifically "Design Thinking" has been a popular approach (Kupp, Anderson, & Reckhenrich, 2017). The main idea is that the methods used by professional designers are of value to organizations trying to innovate (Kimbell, 2011), and many high-profile consulting firms like McKinsey, IBM, and Deloitte have already acquired design consultancies (Liedtka, 2018).

One of Denmark's largest IT companies and the researcher's employer, NNIT, has set out to follow the trend of applying designerly approaches to innovation. The managers of the newly established innovative and cross-functional department, Digital Together, have collaboratively defined a wish for the department to incorporate Design Thinking as an approach when working on client-based projects. Specifically, the department's Digital Strategy, Innovation, & CX team is pointed out as the flagship for practicing Design Thinking. However, no initiatives have been launched that enables the consultants to learn about, integrate, or use this new approach in their work. So how can the consultants with no prior design experience integrate Design Thinking in their practices? Which needs to the individual consultants have? And which challenges and opportunities are related to the implementation and use of Design Thinking in this specific, organizational context?

This wondering and the specific case in NNIT motivated me to conduct a Literature Review (§ 2.2) on the topic, from which I found that very few empirical studies have been conducted regarding the implications of using Design Thinking in contexts beyond the traditional preoccupation of designers, and with the specific focus on the implementation and use of Design Thinking by inexperienced employees in companies. As stated by Buchanan (1992), a deeper understanding of Design Thinking will make cooperation and mutual benefit possible between those who apply it. On this basis, I formulated the following problem statement and research questions:

1.1 Problem statement

PS: How do the consultants in the Digital Strategy, Innovation, & CX team currently work
in projects, and how can Design Thinking be implemented and used in their future work?

1.1.1 Research questions

RQ1: What is Design Thinking, and how has it previously been implemented and used in an organizational context?

RQ2: Which methods and processes do the consultants in NNIT currently use in their work practices?

RQ3: Which challenges do the consultants experience as related to the implementation of Design Thinking in their work practices?

RQ4: Which needs do the consultants have in relation to implementing Design Thinking in their work practices?

1.2 Research scope

In the following section, I present the scope that my research was conducted within. I initially describe how I framed the situation and defined the specific problem. Then, I present my motivation for conducting the research and how it will contribute, which is followed by a presentation of the limitations to the study.

1.2.1 The situation

As argued by Schön (1983, p. 40), problems are not a given form that presents itself to the researcher. Problems are constructed from the materials of problematic situations, which means that they are unique and connected to a specific situation. Thus, the researcher sets the boundaries for the directions of the situation; she *names* the things to attend to and *frames* the context within which they will be attended to. In other words, I needed to specify which elements, problems, or

themes in the situation that I wanted to turn my attention to, and, therefore, which I did not want to attend.

Due to my employment as a Student Assistant in NNIT, I had a unique insider-position in the Digital Strategy, Innovation, & CX team, which enabled me to frame the problematic situation from within. The organization of the team, department, and company is illustrated in Figure 1; Digital Together is an individual NNIT department, which is further separated into three different teams. The teams mainly consist of consultants, which means that the work is primarily constituted by internal or external projects.

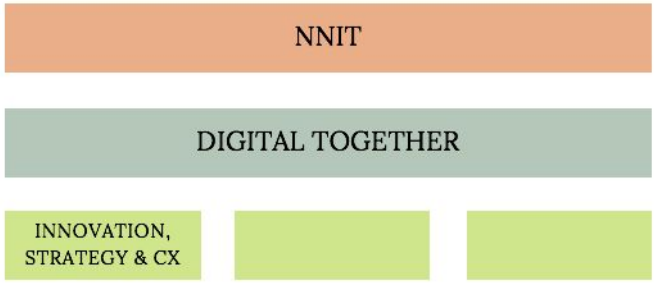

Figure 1: Organization of the department

When launching the department in September, 2018, the management team of Digital Together communicated that they wanted to make innovation and, more specifically, Design Thinking a part of the department's services and approaches, because they had an assumption that it would give the department a stronger competitive advantage when formulating propositions for the clients. The managers specified that the method should initially be implemented by the consultants in the Digital Strategy, Innovation, & CX team as an approach to their problem-solving in projects, but not how or with which tools they were supposed to practice it. Further, the consultants in the team are not all educated in innovation strategies, they do not share areas of expertise, and neither do they share the same job title. From previous semesters' human-centered approach and as a result of my own position in the team, I named the problem in the situation to be the mismatch between the managers' wish to create a change in the consultants' practices without first investigating what their individual needs and resources were in order for the change to actually happen. However, this was a qualified guess, which is why it required further investigation.

At first glance, this case appeared simple in nature; I needed to develop some sort of platform or a tool that would enable the consultants with no prior design experience to use Design Thinking in

their practices. However, when delving deeper into the inquiry, I uncovered the complexity of the problem. Through a reciprocal interaction with some of the consultants, I started understanding that they had different needs, that there was a general lack of knowledge about Design Thinking in the department, and that the problem was multifaceted and in fact hard to define in a clear-cut manner. Based upon these reflections, it became clear that I was working with a *wicked problem*, which by nature is unique and ill-defined (Rittel & Webber, 1973). Further, wicked problems do not have a definite solution but can have several good or bad solutions (Buchanan, 1992). To address the wicked nature of the problem, I, therefore, took a pragmatic approach to the problem solving and acknowledged the need for a new iteration of the process, in which I re-defined the nature of the problem, which is further elaborated in §5.2. Instead of focusing on the product and "designing *it* right", I focused on the users and "designing the right *it*". My research strategy and approach to taming the wicked problem is further elaborated in §3.1 and §5.2.

1.2.2 Motivation and contribution

My motivation for conducting this study was anchored in several aspects. The first aspect offsets in the challenges defined in the scoping of the research; if not addressed, the wicked problem might expand and get resounding implications for Digital Together's use of Design Thinking. By providing empirical insights into the consultants' perceptions of the values and effects of implementing it, I contribute with findings that may create a foundation for the design of solutions for the wicked problem in the future. Furthermore, it is to the best of my knowledge that little or no research has been carried out on the use of Design Thinking by novice designers in a multidisciplinary team within a Danish organization. Therefore, my research may bring original, new perspectives to the existing literature within the field. Finally, as a student on the Information Studies program, I was limited by the objectives thereof, which entails acquiring knowledge and skills in conducting user research and to develop an information design - both with ICT in the center of attention. Thus, I was motivated to adhere to these and conduct a high-level, scientific study, that would tie a knot on the last two years' comprehensive studies.

1.2.3 Limitations

As with all social research, my thesis suffered from certain limitations. Besides the aforementioned constraints inherent in defining the nature of the problem and, therefore, the scope of the project, I experienced limitations with regards to my dual role as a scientific researcher and as an employee in the chosen organization. Though presenting me with an advantage when recruiting the participants

in my research, my role as a Student Assistant in the department might have implicated my research in different ways. Kvale & Brinkmann (2009c) argued, that researchers with a connection to their participants might struggle with conducting neutral investigations. However, my connection to the participants in my research might also have provided me with a unique advantage, as it may have made the participants more comfortable in the situation and, thus, made them more honest and open. Furthermore, the thesis suffered under time restraints, which meant that I had to prioritize where to use my resources. Therefore, the empirical foundation of the thesis is rather slim, which also affected the results concluded from it. As the only researcher, I had to narrow the scope to a size that was manageable to single-handedly investigate in the time I had available. My framing of the problem is, therefore, also subject to specific limitations, as I in the scoping of the situation intentionally removed my focus from specific subjects. Further elaborations on the limitations of the study and how I adhered to research quality criteria can be found in §3.4.3 and §5.3.

1.3 Thesis design

While §1 contains brief insight into the problem under scrutiny, the rest of the thesis is structured as follows. In §2, I initially describe my structured process of gathering and reviewing previous studies and theory on the topic, that enabled me to determine my scope. In addition, I present a body of related work that is deemed relevant to the process of implementing and using Design Thinking in an organizational context. §3 contains a comprehensive walkthrough of the methodology applied to both collect and analyze data as well as the ethical implications thereof. Furthermore, the section accounts for the research strategy, research design, and participants in the research. Subsequently, I present and analyze the research results in §4, whereas §5 outlines the findings of the research and discuss these in the light of the problem statement and related work. Moreover, I critically discuss the quality of my findings and suggest directions for future work on the topic. Finally, I conclude on the problem statement in §6.

2. RELATED WORK

As argued by Rowley and Slack (2004, p. 31), “all research needs to be informed by existing knowledge in a subject area”. To enable myself to investigate and move forward with the defined problem, I, therefore, needed to review existing literature in the field to pinpoint where my research would provide original and significant insights. This argument coincided with my DBR-approach as presented in §3.2, which states that the researcher should generate evidence-based claims that further the theoretical knowledge of the field (Barab & Squire, 2004). For this purpose, I conducted a literature review in which the goal is to summarize the state of the art in the chosen subject field (Rowley & Slack, 2004). This is done by finding current literature on the topic, which forms the basis for the justification of future research in the area (Cronin, Ryan, & Coughlan, 2008). The section is initiated with a description of how I systematically approached the gathering and later reviewing of literature, which is followed by a presentation of related studies and literature.

2.1 Literature search

As my intention was to point out gaps in the existing literature, I chose to conduct a *systematic literature review*, which embodies a well-defined search strategy in relation to a clear purpose (Jesson, Matheson, & Lacey, 2011). In this literature review, the strategy is related to the production of a well-defined plan as well as the search for and selection of literature. However, my pragmatic approach enabled me to re-frame the problem and keep an iterative, exploratory approach to the scope of the situation, which meant that both the literature searching and the literature reviewing became an ongoing process throughout my work on the thesis, too. For example, after conducting the interviews and realizing the wickedness of the problem, I also recognized that my current topics needed to be expanded and that new areas needed to be covered, which led me to define new search keywords and discard some of the existing ones. The research question that guided me in the last iteration of searches and that the literature review seeks to answer is RQ1: *What is Design Thinking, and how has it previously been implemented and used in an organizational context?*

Randolph (2009) argues, that an effective approach to use when planning a research review is to consider where the proposed review fits into Cooper’s (1988) Taxonomy of literature reviews, which contains five characteristics; *focus*, *goal*, *perspective*, *coverage*, *organization*, and *audience* (p. 2). Each characteristic represents an important factor to consider before conducting a literature search and

review (Cooper, 1988). In the following section, I explain how I planned and executed my literature search and review based on the five characteristics.

2.1.1 Systematic searching

The first two characteristics are *focus* and *perspective* (Cooper, 1988). My primary *focus* of the literature review was to search for *practices or applications*, as I wanted to investigate how Design Thinking has previously been implemented and used in similar, organizational contexts like the one in NNIT Digital Together. This type of literature review can help establish a practical need not currently being met (Randolph, 2009), which coincides with the *goal* and *perspective* of my literature review; to identify a gap to scope my inquiry within.

I initiated the search by utilizing the *Building Blocks Strategy* as explained by Schlosser, Wendt, Bhavnani, and Chiwetalu (2006), in which the information need is parted into specific concepts of interest. I was specifically interested in other empirical studies on the use of Design Thinking in an organizational context. Therefore, I identified; (1) Design Thinking as my main concept of interest, with; (2) Study and; (3) Organization as the context-specific, subsequent concepts. After determining the concepts of interest, I identified a set of keywords for each one, for which I used a thesaurus (www.thesaurus.com) to determine related synonyms.

After deciding topics and keywords, I created search strings to use when crawling databases. The topics were searched both individually and in combination, and for the latter purpose I used the *boolean operators* "AND" and "OR", as databases often incorporate these when differentiating between topics (Cronin, Ryan, & Coughlan, 2008). As my searching progressed and I started reading through the titles and abstracts, I used *citation pearl growing* (Rowley & Slack, 2004) as I identified new keywords that were incorporated in my search strings. For example, I noticed that "Designerly Thinking" was a frequently used synonym to "Design Thinking", which led me to incorporate it in my future searches as part of the concept. Further, I looked through the papers' reference lists and used the "cited by"-function in Google Scholar to identify new titles and keywords to search for. To secure a structured and well-documented execution of the literature search, I used a search scheme as shown in Appendix 1.

Due to the very high number of databases, it is an essential step of the search process to identify which databases are relevant for the search frame (Cronin et al., 2008). As I wanted to find literature on Design Thinking used in an organizational context, I searched in topic-specific databases like

Business Source Premier. To widen my search, I also searched in academic databases like ProQuest, EBSCOHost, Google Scholar, and Aalborg University's own database, AUB. To keep an academic and scientific focus in my search, I excluded popular literature like websites, magazines, and blogs, and included only academic literature like conference papers, articles published in journals, working papers, books, and so forth. Further, I chose to only search for peer-reviewed articles both to narrow the search and to ensure higher scientific quality in the searched literature.

2.1.2 Systematic selecting

The literature search resulted in a download of 125 papers. My *focus*, *goal*, and *perspective* of the search affected the *coverage* of my selection of literature, as the specified purpose led me to conduct a *purposive sample*. The next step in my search process was to screen the papers and select relevant ones for review, which was done through several iterations.

In the first iteration, I previewed both titles and abstracts in order to reduce the amount of literature to only those relevant for my scope. From this inspection, I was able to remove 57 articles due to irrelevant content, as it appeared that some of the papers regarded the use of Design Thinking in too different an organizational context than the one in NNIT. Unfortunately, I also experienced that some of the references were either not published yet or inaccessible for me through my AAU student ID, which forced me to disregard a larger number of papers than preferred. Further, Rowley and Slack (2004) argue, that the core of the literature review should be formed by articles in scholarly and research journals. As many of the retrieved papers were not scholarly or empirical studies regarding the use of Design Thinking in organizations, which was my main goal to find through the literature search (§2.1.1), a number of these were removed as well.

In the next iteration, I reviewed all papers in greater detail than previously. For this purpose, I printed and cut out the abstracts from the papers and, after reading through them and assessing their relevance, performed a card sorting of the abstracts. Card sorting is a method for grouping, categorizing, or sorting through content (Spencer, 2009), and it was also a fruitful approach for me to get an overview of the content as illustrated in Figure 2.

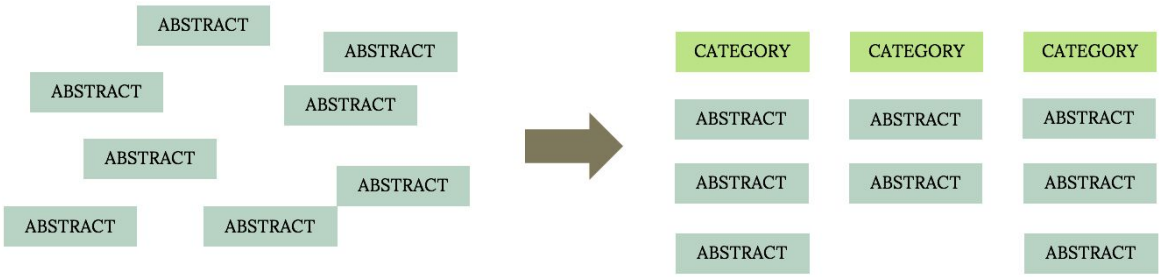

Figure 2: Card sorting process

I categorized the abstracts based on their purpose, keywords, and whether the paper was theoretical or based on empirical studies. The results of the card sorting and literature selection are presented in the following.

2.2 Literature review

In the following section, I present and review the body of literature that I carefully selected in the systematic searching. The review is structured based on a *conceptual organization* (Randolph, 2009), which means that the literature is presented under the themes identified in the abstract card sorting as described in §2.1.2. As the purpose of the literature review was to pinpoint where my research would provide significant and original insights, it enabled me to choose a direction for my inquiry and, therefore, it became the first step in my research process, which is further explained in §3.2. Further, the literature review answers my first research question, RQ1: *What is Design Thinking, and how has it previously been implemented and used in an organizational context?*

To establish the context for my research, I found it relevant to initially present the discourses of Design Thinking in §2.2.1, which formed the foundation for my understanding of the concept. In §2.2.2 and §2.2.3, I presented the scholarly, empirical studies I was able to find regarding both the implementation and use of Design Thinking in an organizational context. Finally, I summarized the presented literature in §2.2.4 and identified how my research would be significant.

2.2.1 The discourses of Design Thinking

Though receiving much attention in recent years by both researchers and practitioners within a range of fields, the mounting interest in Design Thinking has not led to a clear understanding of the concept (Kimbell, 2011). There seems to be a lack of coherence between what the concept of Design Thinking entails in academic and practical terms, which makes it difficult to study (Carlgren, Rauth, & Elmquist, 2016). As explained by Dunne and Martin (2006, p. 512), "Even as managers are adopting these approaches, practitioners are attempting to define them". However, scholarly researchers within the field argue that a single definition of the term would be too narrow and essentialistic, as the Design Thinking discourse has different meanings depending on the context it is used within (Johansson-Sköldberg, Woodilla, & Cetinkaya, 2013).

Johansson-Sköldberg et al. (2013) conducted a review of existing literature within the design field, from which they found that Design Thinking can be divided into two major themes; (1) Designerly thinking, which refers to the academic construction of the designer's practice, and; (2) Design Thinking, which refers to design practices used beyond the design context and more specifically in a management discourse. To establish the context for my research, I find it relevant to initially present the central theories behind Designerly Thinking, as these approaches might have shaped the way the term Design Thinking is used by practitioners today.

Designerly Thinking

Within academic literature on design and architecture, designerly thinking has been widely used in the past 40 years or more (Johansson-Sköldberg et al., 2013). Rittel and Webber (1973) were some of the first to direct attention to linear problem-solving processes and their inability to produce successful results under conditions of complexity and uncertainty. Ten years later, Schön (1983) described designerly thinking as a reflective practice, describing the development of theories as a reflective "shaping process" in which the situation "talks back". He constructed a practice-based, pragmatic portrait of the professional designer that focused on the relation between action and reflection-in-action, which allows for constant improvement and re-creation.

Designerly thinking has also been described by Buchanan (1992) as a way of solving 'wicked problems', building upon Rittel and Webber's (1973) theory that problems in design are often ill-defined and without one clear solution. To solve a wicked problem, designers must focus on the context of the situation, identify the views of all participants, and explore both problem formulation and solution by constructing working hypotheses. He argued that designers conceive the situation

on two levels; general and particular, and that a design process moves between the particular and the abstract. Building upon Schön (1983) and Buchanan's (1992) pragmatic approaches, Krippendorff and Butter (2007) presented a more hermeneutical way of viewing designerly thinking as they defined designers' work as a creation of meaning rather than artifacts. According to Krippendorff and Butter (2007), the core of the design process is meanings, to which the artifact becomes a medium for communicating these.

Design Thinking

Dunne and Martin (2006, p. 517) distinguished Design Thinking from design, as the former is the way designers think, which is "the mental processes they use to design objects, services or systems". Many academic publications rely on the same high-level description of Design Thinking, for example Brown (2008), author of many popular articles on Design Thinking, described the concept as a human-centered approach to innovation that is anchored in the ways designers think and work.

Dunne (2018) differed between Design Thinking as a problem-solving *process* and as a *way of thinking* about problems. When regarding Design Thinking as a problem-solving process, Brown (2008, p. 88) argued, that "the design process is best described metaphorically as a system of spaces rather than a predefined series of orderly steps". The three spaces that a design process must pass through are; (1) inspiration, which regards the circumstances that motivate the search for solutions, (2) ideation, which is the process of generating and testing solutions, and (3) implementation, which guides the design's path to the market (Brown, 2008). Dorst (2011) argued that problem framing is one of the key elements of the approach that enables it to yield more useful solutions than conventional problem-solving approaches. A similar definition was made by Johansson and Woodilla (2009, p. 1), who defined Design Thinking as "a way of approaching practical problems and problem-solving", and argued that the concept is closely related to innovation.

In both scholarly- and practitioner-focused literature, Design Thinking as an instrumental tool for problem-solving has been framed as adding value to the quality of solutions produced (Liedtka, 2018). Further, Design Thinking has been described as an effective toolkit for innovation (Tschimmel, 2012), as a method to be more innovative and produce ground-breaking ideas (Brown & Wyatt, 2010), and as a set of iterative, formal design actions in the form of initial exploratory data collection activities intended to identify user needs and problem definition, which is followed by the development of ideas that are then tested as a prototype (Liedtka, 2018). Moreover, user involvement in every phase of the design process is a recurring theme within Design Thinking literature (Brown, 2008; Carlgren el al., 2016).

In addition to the formal design methods, management scholars also highlight the mindset and desire to do something differently (Kleinsmann, Valkenburg, & Sluijs, 2017). Today, "qualities of being hypothesis-driven, abductive, dialectical and focused on the particular, form the theoretical foundation for Design Thinking" (Liedtka, 2018, p. 6). When arguing for the use of Design Thinking, Martin (2010) stated that organizations must utilize abductive reasoning, meaning, that ideas, concepts, or new thoughts cannot be proven in advance. The abductive form of reasoning is further explained by Dunne and Martin (2006, p. 513), who argued that business education should be made more like design education, as designers "can solve the most wicked problems through collaborative integrative thinking, using *abductive* logic, which means the logic of what might be" (for further explanation of abductive reasoning, see §3.1.3. Thus, it seems that Rittel and Webber's (1973) description of 'wicked problems' in design has gained ground in today's management discourse as well.

When reviewing the contributions to the discourse of thinking like a designer, it became clear to me that designerly thinking has been addressed by some in a general, processual way, while others focus on more specific areas of concern like problem-solving or the use of specific methods. As the prevailing aim of this thesis is to investigate how Design Thinking can be implemented and used in NNIT Digital Together, i.e. in a business context, I have mainly directed my attention towards the implementation, application, and description of Design Thinking in management discourse.

2.2.2 Implementing Design Thinking in organizations

During the past few years, Design Thinking has found its way into the practice of many large organizations (Martin, 2011). Dorst (2011) argued the interest in Design Thinking has been sparked by organizations who struggle with handling open, complex problem situations. However, when searching for studies within the field, I found that at only a small number of empirical studies on Design Thinking in organizational settings has been carried out. As a possible result hereof, an understanding of the implications of implementing Design Thinking in a company context is lacking (Carlgren, Elmquist, & Rauth, 2014). In the following section, I present the empirical studies I was able to find within the organizational scope.

In his qualitative study, in which 20 interviews were conducted in organizations in the public, private, and non-profit sectors, Dunne (2018) found that Design Thinking has often encountered systemic and cultural challenges in organizations due to its distinct mindset and methods. One

cultural barrier is based on the “freewheeling nature of design, with its emphasis on qualitative research, storytelling, and iteration (Dunne, 2018, p. 13), which can be difficult to integrate into organizations that prioritize efficiency and certainty. Further, the organizational form of the design program should be defined before implementation, as the success hereof is dependent on the organization's goals, context, and culture. If the purposes for implementing Design Thinking are not clearly defined, or if the senior executives in the company are not well-informed about the implications of the implementation, it can compromise the success of design programs. Finally, Dunne (2018) argued that Design Thinking is valuable, but that a more nuanced understanding of the organizational benefits is needed.

Rauth, Carlgren, & Elmquist (2015) conducted 36 interviews with managers and leaders in six large organizations with at least five years of experience with using Design Thinking. The study’s purpose was to investigate the efforts made by the managers when implementing Design Thinking in the organizations, to which the overarching challenge in each one of the six companies was to create legitimacy for the use of Design Thinking in the organization. Results showed that challenges were linked to what interviewees regarded as important values of Design Thinking; the exploratory nature of the approach, interacting with users in several steps of the process and learning from failed projects. After an initial “honeymoon period” (Rauth et al., 2015, p. 50), during which both managers and coworkers were excited about Design Thinking, it was not prioritized in the daily work and a growing demand for tangible proofs of concept emerged, which appeared challenging as it was hard to trace successful projects back to its use of Design Thinking. The authors concluded that to make Design Thinking happen, managers in the organization must secure acceptance and support amongst co-workers in the use of the approach.

A few studies have been conducted on how novice versus expert designers or design teams adopt Design Thinking. Seidel and Fixson (2013) conducted a study with 14 different multidisciplinary teams who worked with product development and used design methods in both divergent concept generation phases and convergent concept selection phases. From their study, they found that formal design methods for brainstorming, prototyping, and needfinding were useful in both phases. Conclusions from their study show that to successfully implement Design Thinking in novice multidisciplinary teams, the team members need to be guided to combine methods, to be aware of brainstorming limits, and to learn how to transition from more reflective practices to less reflective practices.

2.2.3 Using Design Thinking in organizations

As argued by Dorst (2011), the value of integrating designerly practices in other contexts than in the design disciplines should not be found in the adoption of something as vague as 'Design Thinking', but rather in how these specific design practices can be applied. In an interview study with a number of *Fortune* 100 organization, Liedtka (2014) found that by using Design Thinking tools like ethnographic interviewing or customer journey mapping, people stayed involved with the problem long enough to reframe the opportunity. Thus, it seems that the user-centered focus and iterative nature of the approach enable project participants to expand their problem-solving possibilities. Further, conclusions showed that the most significant impact of Design Thinking is that it enables an ongoing conversation between designers and managers.

In a later, exploratory research study, Liedtka (2018) examined 22 organizations spanning a variety of sectors and their utilization of Design Thinking. The aim was to identify what is actually being practiced under the name of "Design Thinking" and how it affects the organization's innovation performance. The author found that five key practices were incorporated in innovation processes in the researched organizations: (1) a deep understanding of user needs, (2) the formation of diverse teams, (3) dialogue-based conversations, (4) the generation of multiple solutions that were tested, and (5) the use of a structured process (Liedtka, 2018, p. 10). However, results concluded that the power of Design Thinking does not exist within the individual practices and the elements of the approach considered in isolation, but rather when incorporated and used in a full, end-to-end problem-solving process. Thus, the linkage between Design Thinking practices and how they impact innovation outcomes is complex and multidirectional (Liedtka, 2018).

A similar focus characterized a study by Carlgren et al. (2014), who researched how companies who practice Design Thinking perceive the organizational value of it in relation to innovation. The authors collected empirical data through 36 interviews in six large firms in Germany and the USA, which they coded through open coding and selective coding. Results showed that the use of a process tool for collaboration leads to better teamwork, a more holistic view on the development, and that employees had been pushed out of their regular way of thinking, which broke down organizational barriers to innovation. Further, according to Carlgren et al. (2014), the use of Design Thinking enables iterative working and rapid feedback cycles with customers, however not specifying which Design Thinking practices that are the enablers, like Liedtka (2018) did. In one of the examined companies, the authors found that Design Thinking had been introduced as a process with precise steps, to which project participants had been "blown away with how structured and

efficient the process was" (Carlgren et al., 2014, p. 413). Conclusions showed, that the perceived value of using Design Thinking in an organization is context-dependent.

2.2.4 Summary and significance

When reviewing the literature on Design Thinking, I found that there exist many different definitions of what the concept entails in both scholarly and practical terms. From the limited amount of empirical studies found within the organizational scope, I conclude that Design Thinking can be troubling to implement in organizations as its abductive, free-wheeling, and exploratory nature often conflicts with existing cultures and approaches. Further, if the purpose for implementing Design Thinking is not clearly defined and supported by managers in the company, it can compromise the success of design programs. The value in integrating Design Thinking must be found in how the specific design practices can be applied in a full end-to-end process, for which especially novice designers need guidance in implementing and using the different methods in their designerly problem-solving. Finally, studies showed that when using Design Thinking as a process tool it lead to better teamwork, a more structured view on the process, and pushed employees out of their regular way of thinking, which broke down organizational barriers to innovation. However, the perceived value of using Design Thinking in an organization is dependent of the context.

After conducting an extensive literature search and review, it is to the best of my knowledge that little or no research has been carried out on the use of Design Thinking by novice designers in a multidisciplinary team within a Danish organization. In many of the existing empirical studies, interviews were conducted with either managers, senior executives, or already established design teams that had some or a lot of experience with Design Thinking already. Therefore, I argue that my structured, empirical research will provide original insights into the challenges and opportunities that emerge prior to novice designers' use of Design Thinking, and simultaneously advance the existing theory on Design Thinking in an organizational context.

3. METHODOLOGY

In the following chapter, I present the methods and ideologies applied for collecting and analyzing the empirical data that serve as the foundations for the later analysis. I initialize the chapter by accounting for my *research strategy*, which signifies the relationship between theory and research in my study along with the ontological and epistemological orientation. The section is followed by a description of my *research design*, which indicates the framework within which my social research is carried out (Bryman, 2012a). Subsequently, I account for the practical execution of my research followed by a presentation of how I analyzed the data. Finally, I reflect on the ethical implications of my research.

3.1 Research strategy

According to Bryman (2012a, p. 5), "The theories that social scientists employ to help to understand the social world have an influence on what is researched and how the findings of the research are interpreted". Before conducting social research, the investigator must, therefore, consider both epistemological and ontological issues, the nature of the relationship between theory and research, and which research approach the data collection will be guided by (Bryman, 2012a). On this basis, I use the following section to account for the research strategy I applied in my study and how it influenced my creation of theories about the examined reality.

3.1.1 Philosophy of science

When conducting research, the investigator is guided by a worldview or a belief system, a paradigm, not only in his or her choices of methods but in epistemologically and ontologically grounded ways (Guba & Lincoln, 1998). The worldview that guided me in my research was based on the pragmatic paradigm, as the purpose of my research was to investigate a part of reality with the goal of making a change in it. More specifically, I wanted to research the consultants' work practices to identify how Design Thinking can become a part of them in the future.

The essence of pragmatic ontology is actions and change (Goldkuhl, 2012), and it acknowledges that there might be several approaches to a scientific area that all highlight essential elements of the studied situation (Rønn, 2006b). In my inquiry, this is manifested in my use of different methods for

collecting data as presented in §3.4. A pragmatic epistemology is oriented towards practice, in which the criteria for valid knowledge is that it shows its usefulness through the application of it (Rønn, 2006a). In other words, theory and practice are merged in the sense that theory stems from practice and must be evaluated on this basis (Dalsgaard, 2014). In my inquiry, this is manifested in the fact that I collected empirical data, which means my research was conducted with consultants from the target population and in a real-life, practical setting.

Goldkuhl (2012) refers to Dewey's (1938) concept of inquiry, which is the notion of investigating some part of reality with the intention of making a controlled change in it. Humans are, fundamentally, in the world as active creatures who only acknowledge the world through practices (Brinkmann, 2006). From the Deweyan view on inquiry, the researcher doubts or tries to understand a situation that is thus far incoherent and indeterminate (Ejsing-Duun & Skovbjerg, 2018; Dalsgaard, 2014), which was the case in my research; the management of Digital Together had defined that Design Thinking should become a part of the consultants' practices, but not *how*, *when* or *why*. Based on this, I initiated the structured research that was intended to provide me with sufficient knowledge to create a change in the situation and, thus, make it determinate. Change and improvement are central elements in pragmatic research, which means that the researcher not only cares about what *is* but also what *can be* (Goldkuhl, 2012). In a pragmatic mindset, the determination of a problematic situation is an iterative, ongoing process that cycles between framing the situation, generating hypotheses and evaluating these through practice (Dalsgaard, 2014). How my inquiry was an iterative, ongoing process of problem-framing and hypothesis generation is further reflected upon in §5.2.

3.1.2 Qualitative approach

As previously mentioned, methods are closely tied to different versions of how social reality should be studied (Bryman, 2012b). When planning my research strategy, I, therefore, also found it important to decide which research methods would be beneficial for me to use in order to collect valid and useful data. For this purpose, I turned to Mulder and Jaar's (2007, p. 40) map of the most popular methods for conducting user research.

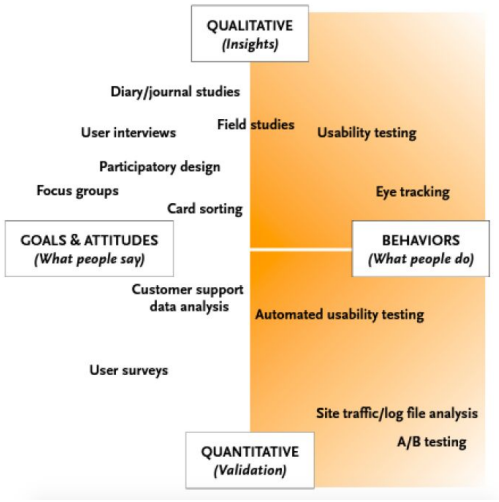

Figure 3: The User Research Landscape (Mulder & Jaar, 2007)

As Figure 3 shows, the X-axis differs between qualitative and quantitative research approaches. Qualitative research is about discovering new things based on a small sample size, whereas quantitative research is about testing or proving something with a large sample size (Mulder & Jaar, 2007). The small sample size in qualitative research makes it possible to uncover previously unknown issues and get new ideas, whereas the large sample size in quantitative research enables the researcher to find statistically significant trends and test hypotheses (Mulder & Jaar, 2007).

Based on these distinctions and the limited volume of empirical studies on Design Thinking in an organizational context, I decided to take a qualitative approach to my collection of data as I believed an exploratory approach to best suit the emergent nature of the subject. Further, as it can be seen in Figure 3, the Y-axis differs between "goals and attitudes" and "behaviors". Based in this distinction, I positioned my inquiry to mostly focus on the top left corner, which means gaining insights into the consultants' goals and attitudes, as there was no previously developed interface or communication design that I could usability test.

According to Denzin and Lincoln (1998, p. 2), "Qualitative research is a field of inquiry in its own right". It is a naturalistic approach to the subject matter, where qualitative researchers study things in their natural settings, "attempting to make sense of, or interpret, phenomena in terms of the meaning people bring to them" (Denzin & Lincoln, 1998, p. 3). In my research project, I studied the consultants' previous and current practices and wishes for the future in their "natural" setting, NNIT. On this basis, it can be argued that by taking a qualitative approach to my research, I also

adopted a phenomenological viewpoint in my collection of data. Phenomenology in this sense points to an interest in understanding social phenomena based on the actors' own perspectives and to describe the world as it is perceived by them (Kvale & Brinkmann, 2009b). My phenomenological viewpoint was, however, serviced by my pragmatic approach, as I wanted to use the participants' subjective descriptions of their perspectives and wishes for the future to investigate how Design Thinking could become a part of their future practices. My study of the phenomena was intended to make a change in the consultants' worlds, which also affected my analysis of the data as described in §3.5.

3.1.3 Reasoning

When deciding my research strategy, I also considered whether I wanted to collect data to test or to produce theories. A traditional way of viewing the nature of the relationship between theory and research is to decide whether one is reasoning from an *inductive* or *deductive* point of view (Bryman, 2012, p. 24). With a deductive stance, theories are the foundation for new research, whereas theory is the outcome of research from an inductive stance (Bryman, 2012, p. 26). However, within the pragmatic paradigm, the researcher investigates from an *abductive* point of view. Kolko (2010, p. 70) argued, that "unlike deduction or induction, abductive logic allows the creation of new knowledge and insight" which coincides with the pragmatic purpose of my study; to gain insights about reality with the goal of using them to create new knowledge, which is then used to make a change in reality.

Abduction is the first stage of the researchers' attempt to add meaning to their observation of a certain phenomenon (Psillos, 2011). In this case, my observed phenomenon was the introduction of Design Thinking in NNIT's department, Digital Together. The abductive approach is characterized by reasoning that moves back and forth between deduction and induction by first converting observations about reality into theories or soft hypotheses, and then assessing, testing or evaluating those theories through actions (Morgan, 2007; Psillos, 2011). This means that I, after observing the phenomena in reality, synthesized my observations and initial assumptions in a problem statement, i.e. a theoretical statement about the observed reality (§1.1). Then, I conducted both desk research and social research, which allowed me to draw conclusions about my formulated problem and, thus, initiate the development of new theories within the research field. This means that in my project, theories are not brought into and investigated in a research project but evolved, discovered, or verified through empirical data (Boolsen, 2010).

3.2 Research design

After deciding the research strategy, which is the broader orientation towards social research, the *research design* must be determined. The research design symbolizes a structure that is intended to guide the execution of research methods and the analysis of the collected data (Bryman, 2012c). Further, the research design also determines the quality of the conclusions drawn from the research results (Bordens & Abbott, 2011a). The following section contains further elaborations on this and descriptions of the structures I utilized to guide my research.

3.2.1 Design-Based Research

As previously mentioned, the overarching aim of this study was to inquire about the prerequisites for how Design Thinking can become a part of the NNIT consultants' future practices. In order to do so, I needed to become acquainted with the literature on Design Thinking to understand its concepts, how others have used it in a similar context, and to pinpoint where my research would provide original and significant insights (§2.2). Further, the research needed to be anchored in practice and not in theory; a criterion defined in my practice-oriented, pragmatic inquiry strategy as described in §3.1.1. This means that to effectively investigate how Design Thinking can be implemented and used in the consultants' practices, I needed to immerse myself in their practices to fully understand the context. For the purpose of advancing and developing theory and conducting a pragmatic inquiry, I used Design-Based Research (DBR) as the main research design for my thesis.

DBR-process

DBR-processes are "iterative cycles of analysis, design, implementation, and redesign" (Wang & Hannafin, 2005, p. 8), which means that the research not only creates or evaluate a design to produce a change in practice but also create renewed knowledge about the domain in question (Amiel & Reeves, 2008; Ejsing-Duun & Skovbjerg, 2018). This corresponds to my pragmatic, abductive approach, in which I defined that the production of new theories, artifacts, or designs will be based on data collected from naturalistic, practical settings. In this study, naturalistic settings are defined as the actual contexts in which Design Thinking would be used by the consultants if implemented in the future.

Further, in DBR, the investigator is not only observing interactions but also scaffolding those they produce theories about (Barab & Squire, 2004). Instead of objectively observing the consultants in

their natural settings and interactions, as in contextual inquiry or case studies (Atkinson & Hammersley, 1994; Flyvbjerg, 2011), the DBR-approach enabled me to facilitate multiple situations where the consultants could interact with me and each other to both define the problems to which our attention should be guided and to pinpoint the outlines of a possible solution. Thus, I treated the participants as co-creators of the situation and not only as subjects, which is another characteristic of DBR (Barab & Squire, 2004). Based on this, DBR can be categorized as a *Participatory Design*-approach, which entails that the user of the product should be involved in every step of the design process (Saffer, 2010). In Participatory Design, the user is not only consulted when necessary but acts as an active part of the design team. The approach is characterized by three things; it utilizes design as a tool for improving a situation, it is collaborative, and it is iterative (Dix et al., 2004b), which are also characteristics within DBR.

Whereas my research strategy guided the relationship between theory and research in my study, I used the DBR approach and its principles in extension hereof as a structure for my research. I was inspired by the innovation model developed by EducationLab (Gynther, 2010), which illustrates the iterative nature and the progression in a DBR process. The model consists of four phases; (1) Context, (2) Lab, (3) Intervention, and (4) Reflection. My own illustration of the DBR-process is depicted in Figure 4.

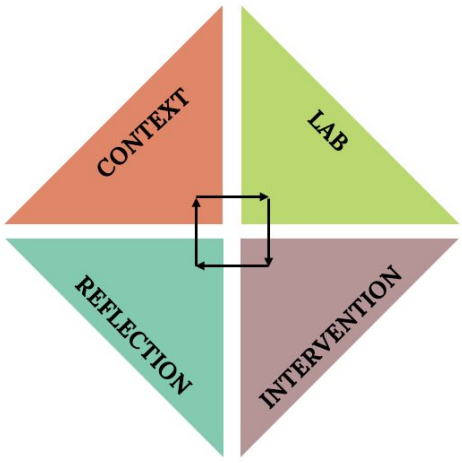

Figure 4: Own illustration of the DBR-process

In phase (1) Context, a DBR project is always initiated by identifying problems in a given context, which can be done through fieldwork or desk research (Gynther, 2010). As DBR is anchored in the existing literature on the field of research (Wang & Hannafin, 2005), I conducted a significant review of literature before my inquiries in practice to deduct the sweet spot for originality in my study as

presented in §2. Further, I conducted interviews with relevant consultants from the Digital Strategy, Innovation & CX team, in which my focus was to investigate their current practices in regards to processes and methods (§3.4.1). The insights gained from the initial research enabled me to move into phase (2) Lab, in which didactic solution proposals are developed through user involvement and manifested in prototypes, design principles, or a design framework (Gynther, 2010). In this phase, I facilitated a Future Workshop with the consultants, in which the focus was to collaboratively create ideas for how Design Thinking could become a part of their future practices (§3.4.2). In phase (3) Intervention, the purpose is to test the prototype or design principles in real contexts with all the variables that characterize reality, and in phase (4) Reflection, the design's possibilities for upscaling and generalization are evaluated and documented. My own DBR-process is illustrated in Figure 5.

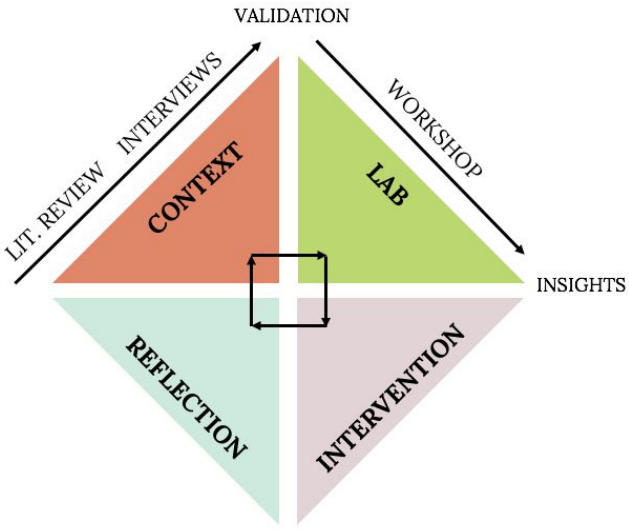

Figure 5: The project's DBR-process

As described in §1.2.1, I spent a lot of time on the problem- and situation framing at the beginning of my inquiry due to the wickedness of the problem. Further, I had specific assumptions and foci when initiating my research, which made it hard to define the problem at hand. Therefore, I focused on conducting a thorough literature review as presented in §2.2, which together with interview findings was used to reframe the situation and redefine the problem. How the wickedness of the situation and the problem definition within affected the quality of my process and research is elaborated in §5.

3.3 Participants

In any research project, participants should be chosen to match the expected user population as closely as possible (Dix, Finlay, Abowd, & Beale, 2004a). In this project, the total population is constituted by all NNIT employees connected to the Digital Together department, as the managers of the three teams argued that Design Thinking should become a part of the entire department's services and approaches as presented in §1.2.1.

Per May 2019, the Digital Together department counted approximately 25 people. However, as the implementation and use needed to grow from somewhere, the managers pointed out the employees from the Digital Strategy, Innovation & CX team as the first ones to work with Design Thinking. The team consists of 10 people including myself and my boss, and the team is multidisciplinary which means that it contains both Business Consultants, UX consultants, the department director, and myself, a Student Assistant.

When recruiting the participants, I used the non-probability sampling strategy, purposive sampling, in which the goal is to sample people who are relevant to the research question being posed (Bryman, 2012h). As the study relied largely on individual perceptions, goals, and attitudes as defined in §3.1.2, my goal was to recruit the remaining 9 employees in the team, excluding me. For both the interviews and the workshop, I recruited the participants through e-mail, in which I informed them about the study's purpose and that the data would be processed anonymously. Giving participants sufficient information about the purpose and design of the interview study prevents that they will be misled (Kvale & Brinkmann, 2009c). To further ensure that the participants were informed about the study's purpose and how their data would be processed, I asked them to sign a consent form before the interview (Appendix 3) and the workshop (Appendix 5).

Even though I informed the participants about the purpose of the study and their contribution to it, as well as provided the consultants with flexible time slots for conducting the interviews, I only managed to recruit 6 out of 9 for the interviews. For the workshop, I also intended to gather as many participants on the same date and time as possible, which turned out to be more of a struggle as the consultants were busy at different times. Therefore, I managed to recruit only 3 participants for the workshop. The demographics of the participant group is illustrated in Table 1 below. Participant 1-6 were part of the interviews, whereas only participant 1-3 were part of the workshop.

Participant	Age	Gender	Job title	Seniority	Experience with DT
P 1	29	Female	Advanced business consultant	1 year	Novice
P2	34	Male	Business consultant	1 year	Novice
P3	29	Male	Business consultant	4 years	Novice
P4	28	Female	Consultant	2 years	Intermediate
P5	53	Male	Senior User Experience Specialist	3 years	Intermediate
P6	40	Male	Senior User Experience Specialist	5 months	Expert

Table 1: Participant demographics

3.4 Data collection methods

The investigator in DBR is not only observing interactions but also scaffolding the interactions that they produce theories about (Barab & Squire, 2004). In the following section, I present the methods used to scaffold the interactions and collect empirical data that, combined with chosen literature, constitute the foundation for my later analyses and conclusions.

The section is structured based on the practical order of the data collections, which entails a presentation of how I conducted six qualitative interviews and of the methodological foundation for the Future Workshop. I followed the Consolidated Criteria for Reporting Qualitative Studies (COREQ) by Booth, Hannes, Harden, Noyes, Harris & Tong (2014) to ensure a high level of validity and transparency in the reporting of my methodological approach. By contributing with a checklist of 32 criteria and questions, COREQ seeks to promote the thoroughness when reporting qualitative research (Booth et al., 2014).

3.4.1 Semi-structured interviews

Goodman, Kuniavsky, and Moed (2012a) argue, that “to really know the user’s experience, you have to ask him or her about it” (p. 129). One of the most widely employed methods for this purpose is *interviews*, which is an active process where the interviewer and the interviewee produce knowledge through their relation (Kvale & Brinkmann, 2009a). As my inquiry was initiated in the context-phase of my DBR-process, in which the purpose was to gain an understanding of the

problem at hand and the context in which it exists (Kanstrup & Bertelsen, 2016a), I chose to conduct six qualitative and semi-structured interviews with six consultants from the Strategy, Innovation & CX CoE. The interviews' position in the context-phase is illustrated in Figure 6 below.

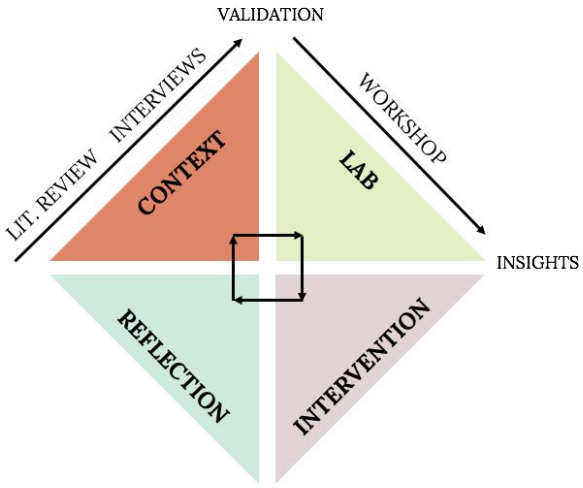

Figure 6: Context phase

In a *qualitative interview*, the focus is on the interviewee's point of view, where the researcher wants to gain insights into what he or she sees as important in relation to the topic. Further, qualitative interviewing does not require any special skills other than interacting with the interviewee, trying to understand their experience, opinion, and ideas (Silverman, 2006). In contrast to the qualitative interview is the *quantitative interview*, which is usually inflexible and fixed with regards to topics, measurement, and processing (Bryman, 2012i). As a consequence of my pragmatic approach, I had not yet fully defined the specific problem to solve when conducting the interviews, which is why the qualitative interview with its exploratory and flexible nature was my preferred method.

Besides utilizing a qualitative approach to interviewing, I also performed them in a semi-structured manner. Semi-structured interviews are useful when the researcher wants to keep an open mind about the contours about what he or she needs to know so that concepts and theories can emerge out of the data (Lazar, Feng, & Hochheiser, 2010a; Brinkmann & Tanggaard, 2010a). However, the semi-structured interview is not completely unstructured, which allowed me to create an interview guide, and, by doing so, consider which information I wanted to collect from the consultants. Furthermore, a semi-structured interview seeks to collect descriptions of the participants' own worlds with the goal of interpreting the meaning of the described phenomena (Kvale & Brinkmann,

2009b), which was useful for my research as the outcome of the interviews were intended to guide the later design practices in my process.

Interview design

The six individual interviews each lasted for about an hour and were carried out at the NNIT headquarters in Søborg, which is the consultants' workplace. As argued by Bryman (2012i), by understanding the interviewee's context, which in this case was also constituted by their work location, the researcher will also understand the interviewee's statement in their own terms. Further, by interviewing the consultants where they work, I aimed to trigger their memory of previous problem-solving and reflections about their future use of Design Thinking in their work practice. For each interview, I booked a quiet and private meeting room to make sure that no outside noise or curious co-workers would disturb the sessions.

Interview guide

In a semi-structured interview, the researcher has a list of questions, often referred to as an interview guide, which contains an overview of topics and suggestions for questions to ask (Bryman, 2012i). The interview guide is meant as a script, that structures the interview process. It can be either very detailed or very loosely defined all dependent on the nature of the interview (Kvale & Brinkmann, 2009e). Prior to my six interviews, I developed an interview guide with five different themes that I regarded as important for the interview's purpose, which was to investigate how the consultants currently choose and deploy methods as part of problem-solving. As I wanted to keep my interviews both exploratory but also true to my initial problem statement and case description, I developed a guide with well-considered questions, that I intended to ask all the interviewees. The themes were as follows (Appendix 2);

(1) Consultant characteristics,
(2) Experience with customer-oriented projects,
(3) Practices in customer-oriented projects,
(4) Learning new methods,
(5) Experience with UX and Design Thinking.

The semi-structured nature of the interviews made it possible to deviate from the guide by changing the order of the questions or asking follow-up questions that emerge as a result of the dialog between me and the interviewee (DiCicco-Bloom & Crabtree, 2006). This quality allowed me to utilize my pragmatic approach by asking further questions in response to what was assessed as

significant replies. However, deviating too much from the initial guide can influence the overall validity and reliability of the data, as the follow-up questions may differ in content and the way they are asked (Bryman, 2012e). I tried to accommodate this by only asking follow-up questions to replies I deemed important, and otherwise follow the interview guide.

The interview guide consisted of 20 questions in total, which were structured under the themes. In theme (1) Consultant characteristics, I asked the interviewees questions about their age, education, previous work experiences, and the length of their employment at NNIT, as I wanted background information about the interviewees to better understand which level of experience they built their knowledge upon. The same argument constituted theme (2) Experience with customer oriented projects, where the two questions "How many projects have you been assigned to in your time at NNIT?" and "How do you view your role in the projects, you have been assigned to?" with the prepared probing question; "Why is your role like this?" were asked (Appendix 2). By asking these questions about the interviewees' experiences and role in projects, I wanted to learn more about their work tasks and how they approach the problem-solving in a project.

The purpose in theme (3) was to emphasize the interviewees' practices in projects and to make them describe how they choose and deploy methods in processes. In this theme, I used what Kvale & Brinkmann (2009e) describe as *preliminary questions*, which were questions like "Try to think of the last project, you were a part of. How did you approach the problem-solving?" and "Try to describe some different scenarios, where you had to choose between methods. How did you choose?". Opening questions like these can provide spontaneous and rich descriptions of a situation where the interviewee independently tells what he or she experienced as important aspects.

In theme (4) Learning new methods, I moved the interviewees from considering how they choose and deploy methods to reflect upon how they prefer to learn new methods. Theme (2) and (3) were specifically relevant for my research as the answers to these questions would provide me with insights into how Design Thinking methods should be accessible for the interviewees to find and, hopefully, learn and deploy.

In theme (5) Experience with UX and Design Thinking, the goal was to get insights into the interviewees' experience with and perception of Design Thinking, their knowledge of UX, Design Thinking and Innovation methods, and to find out whether they use any of these methods actively in their work practices. Finally, I closed the interview by asking; "What would it take for you to use Design Thinking or user-centered methods more in your job?", as I presumed this question would,

based on their previous reflections on learning new methods and their experience with Design Thinking, tie a knot on the interview and give me valuable insights for the analysis and design.

Several authors recommend conducting a pilot test of the interview guide before deploying it on the actual interviewees (Bryman, 2012i; Lazar et al., 2017a), which is why I pilot tested my guide on a coworker who is a part of the department but not of the user-group. In the test, I interviewed the participant by following my initially developed guide, which gave me the following findings:

- The initial first question in theme (2); "What do you think we in Digital Together do well with regards to customer-oriented projects?" was very difficult to answer. My intention with the question was to make the interviewees reflect upon the general problem-solving practices in the department and what they like or dislike about it. However, as the test participant argued that the question was too broad and difficult to answer, I deleted the question.

- When pilot testing question 1 in theme (3); "Think of the most recent project you were a part of. How did you or your team approach the problem-solving?", the participant asked for a piece of paper and a pen to sketch the process for me. When I asked him why he stated that it would be easier for him to remember and describe the memory simultaneously if he sketched while doing it. According to Bryman (2012), "Stimulating interviewees to engage visually with familiar settings and objects may help them to think about things that they take for granted in different ways" (p. 480). I, therefore, decided to make sketching a part of the question, as I hoped it would spark the interviewees' memories like it did the pilot test participant's.

Interview deployment

The people present during the interview was me in the role of the interviewer and the interviewee. Before beginning the interview, I once again briefed the participants about the study's purpose, that the data would be processed anonymously, and that they could terminate the interview at any time if necessary. By providing information about the purpose and design of the interview study to the participants several times prevents that they will be misled (Kvale & Brinkmann, 2009c). By adopting a semi-structured approach to interviewing, I was able to explain unclear questions and prompt the participants to elaborate their answers during the interviews. However, as with all social research, the presence of researcher might impose a social desirability bias, which happens when the interviewee answers what they think is the most socially desirable answer instead of the truth (Bryman, 2012e). To accommodate the potential bias, I made sure to obtain a neutral position and

initiate the interview by empathizing that there were no right or wrong answers and that I was not investigating or evaluating their person but rather their practices.

When conducting interviews that will be subject for later analysis, it is beneficial to document it either by using audio- or video recording (Kvale & Brinkmann, 2009d). I audio recorded the six interviews on my iPhone and chose not to apply video recordings because I was only interested in the content of the interviews and not the interpersonal interaction between me and the interviewee.

3.4.2 Future Workshop

After conducting interviews with the consultants, in which I gained an initial understanding of their current work practices and what might be the contextual problem at hand, I moved into the LAB-phase of my DBR-process as illustrated in Figure 7. In this phase, the purpose is to involve participants from practice to validate the problem identification and support a shared generation of ideas for solutions (Gynther, 2010).

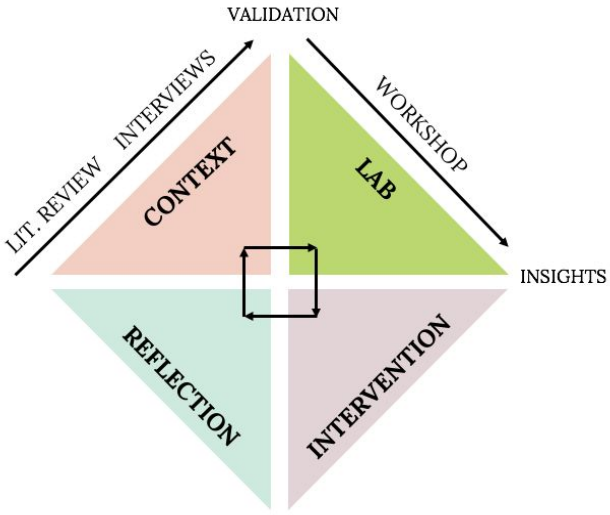

Figure 7: LAB phase

When researching for future practices, the goal is to turn fieldwork into an exercise of creating new ideas (Koskinen, Zimmerman, Binder, Redström, & Wensween, 2011). For this purpose, I chose to conduct a workshop, which is a useful method as it supports participants in the co-operation on visions, priorities, or directions to follow (Kanstrup & Bertelsen, 2016b) and calls for complex decision making (Goodman et al., 2012b). Further, the workshop-format fit well into my pragmatic

inquiry, as it would give me insight into which contextual problems to focus on first, and thus, a direction to point the changes in reality towards.

When deciding which type of workshop to conduct, I was inspired by Dirckinck-Holmfeld and Ræbild's (2017) use of Future Workshops, in which they investigated how a participatory design process could contribute to supporting pedagogical personnel's use of learning platforms in schools. The authors experienced that the workshop made the personnel take more ownership over the chosen learning platform, which is similar to what I wished to achieve with my fieldwork; to make the consultants create ideas for how they can use Design Thinking in their job and, thus, make it an integrated part of their mindset. Further, Bødker, Kensing, and Simonsen (2008) argue, that Future Workshop is a beneficial technique to quickly collect and process viewpoints in the organization, which can contribute to the further work.

A Future Workshop is a method to approach the creation of a design or the change of a situation, in which the focus is placed on co-creation, democracy, and the development of competencies (Dirckinck-Holmfeld & Ræbild, 2017). The goal of the workshop is that the participants gain a mutual understanding of the problematic situation in focus, create ideas for how to improve it and create a plan for how to implement the changes (Bødker et al., 2008). A Future Workshop consists of five different phases;

1. **Preparation phase**, in which the investigator or moderator chooses a theme, a location, and create the playbook for the workshop.
2. **Criticism phase**, where all participants brainstorm on the negative aspects of the specific situation and write them down as notes. The participants then vote on the most important topics for criticism that they want to focus on in the following phases.
3. **Fantasy phase**, in which the participants generate ideas for how the situation could be in the future. Once again, the participants brainstorm and write down their ideas on post-its, which is followed by a vote on which ideas to continue with.
4. **Realization phase**, where the participants assess the ideas based on the conditions in the organization. The participants are allowed to criticize conditions that create a barrier for the implementation of the ideas, and they develop a plan for which actions need to be made to realize the proposals.
5. **Follow-up phase**, where the project group writes a report that sums up the critique, the visions, and the plan (Bødker et al., 2008).

Workshop design

A Future Workshop usually lasts half a day or two days, where the group creates a shared view of what is wrong with the current situation and how it can be improved (Bødker et al., 2008). My workshop was, unfortunately, restricted by the participants time schedules, which meant that I had to limit the timeframe to two hours. To accommodate the participants and respect their work schedules, I decided to facilitate the workshop at NNIT like in the interviews. This choice was also made to trigger the participants' memory of the reflections and feelings they had in the interviews, that were facilitated in the same, quiet room as the workshop. The setup in the room is illustrated in Figure 8 below.

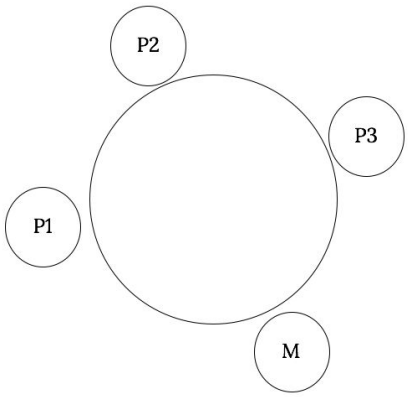

Figure 8: Workshop setting

Workshop guide

Before conducting the workshop, I prepared a workshop guide that functioned as an overview of the different phases and as a checklist containing things I needed to remember in the workshop. As the Future Workshop already contains five phases to follow, my preparation primarily consisted of formulating a problem statement that would guide the workshop and to prepare an introduction to the participants. As argued by Goodman et al. (2012b), a way to frame the workshop problems is to phrase them as a 'How Might We'-statement. From the interviews, I found that I needed to take a step back and focus more on the larger perspective of integrating Design Thinking in the consultants' work practices. Therefore, the HMW-statement for the workshop was; "How might we integrate Design Thinking in your work practices?" (Appendix 4). By using "we" instead of "you" in the statement, I aimed at showing that the integration is a collaborative process.

Further, I prepared an array of questions to ask the participants if they did not know which areas to critique or which ideas to move forward with. As described in §3.3, the participants in the workshop had also participated in the interviews, which meant that I did not ask about their background or job title once again.

I expected that the Future Workshop would provide me with further insights into the tensions and conflicts that are connected to the consultants' use and adoption of Design Thinking in their work practices. Furthermore, I viewed the shared development of solutions as a beneficial element of the method, as the consultants mutually come up with ideas that they might not have thought of individually. The Future Workshop's unique dialogue format can make consultants with different preconditions and understandings create shared visions for how to realize the integration and use of Design Thinking. Especially the critique phase is beneficial to get the participants to detect new connections, to get a mutual understanding of the things that need to be changed, and to make them feel that they are not alone with their criticism (Bødker et al., 2008). Finally, the Future Workshop format fits well with my pragmatic approach, as it enabled me and the participants to only focus on the aspects of the reality that were subjects for critique and, therefore, needed changing.

Workshop deployment

The people present during the workshop was me, P1, P2, and P3. To avoid any biases and affecting the participants' statements and reflections, I did not actively take part in the workshop other than facilitating their activities.

In the **preparation phase**, I introduced the plan for the day, the different phases of the workshop, and the theme that I had identified for the workshop. In the **criticism phase**, the participants conducted an individual brainstorm, in which they formulated critique points as short notes on post-its. I incorporated both post-its and sharpies as part of the workshop, as research shows that the use of material design artifacts helps trigger creativity in participatory situations (Hansen & Dalsgaard, 2012).

To heighten the validity of their statements and avoid social desirability bias (§3.4.1), I assured them that there were no right or wrong answers, that neither of us was here to judge, and that they should seek to be honest. After brainstorming, the participants each presented and gathered their post-its on a large piece of brown paper on the wall, which was intended to function as an open resumé and inspire the next brainstorm.

Subsequent to presenting their critique points, the participants collaboratively grouped the post-its under themes that were named accordingly. Thematic analysis is not officially part of a Future Workshop, however, due to my participatory approach I chose to incorporate this step to secure a higher level of validity in the coding and thematic analysis of the workshop content. By making the participants group their post-its, I also facilitated a discussion of the content and initiated reflections upon which of the critique points were most important to create solutions for. The same procedure was used in the **fantasy phase**. After the fantasy phase, I made the participants reflect on which restrictions we might meet when **realizing** their ideas and how to avoid getting stuck because of them. The **follow-up** phase is represented in my reflections upon the workshop outcome in §5.

Like in the interviews, I was mainly interested in the content of and reflections in the workshop and not the interpersonal interaction between the participants. Therefore, I audio recorded the whole workshop session on my iPhone, which is beneficial when the research will be subject for later analysis (Kvale & Brinkmann, 2009d).

3.4.3 Research quality

Assessing the quality of research based on its validity and reliability is widely applied within social research. In their classical sense, reliability refers to the consistency of measures, which means whether the study can be replicated at another time with the same sample and produce similar findings, whereas validity refers to whether measurement of a concept really measures the intended concept (Bryman, 2012d). Therefore, I utilized this section to account for how I adhered to quality criteria in my research.

When regarding the reliability of the study, researchers tend to distinguish between *internal* and *external* measures. External reliability refers to the degree to which a study can be replicated (Bryman, 2012g), which LeCompte and Goetz (1982) recognize as difficult to fulfill within qualitative research, as it is impossible to freeze a social situation and its circumstances to make it replicable. It is very likely that this is also the case with my research, as the participants' responses, reflections, or ideas might be different in weeks or months due to the rapid changes in the department. However, I have tried to reduce this potential degrade in the quality of my research by following the interview- and workshop guides as closely as possible when conducting the research. By doing so, I, arguably, heightened the level of replicability, as it made the research easier to replicate in the future. The internal reliability of my research, which refers to whether the members of the research teams

agree about what they see or hear (Bryman, 2012g), could be improved as I did not use respondent validation or other methods for validating my findings. However, during the thematic analysis of the interviews, I coded the data multiple times. The iteration of my coding and analysis were intended to heighten internal reliability.

Internal validity refers to the level of coherence between the research and the theories being made from it (Bryman, 2012g). In order to accommodate the internal validity of my research, I carefully considered which themes I wanted to investigate and, thus, which questions I wanted to ask the participants. By creating the interview guide before conducting the interviews, I ensured that the research produced insights that were relevant for the later analysis and conclusion to the problem statement. Further, the semi-structured nature of the interviews and the openness of the workshop enabled the participants to ask clarifying questions, which might have increased the internal validity as it eluded any misconceptions of my questions.

On the contrary, in all social research, the *social desirability bias* might affect the research, as people tend to position themselves in a way that is more socially acceptable (Podsakoff, Scott, MacKenzie, Lee, & Podsakoff, 2003). As all of my data collections were conducted in social settings, this bias might impose a threat to the validity of my research. I tried to accommodate this by telling the participants that there were no right or wrong answers and that they should speak their mind freely. Further elaborations on the quality of my research can be found in §5.3.

3.5 Data analysis methods

For the purpose of analyzing my collected data, I conducted qualitative data analysis. In qualitative data analysis, the goal is to turn the unstructured data into a detailed description of the essential elements of the problem in focus (Lazar et al., 2017b). Thus, my goal when analyzing the data was to obtain a thorough understanding of the empirical foundation and to gain domain-specific knowledge as part of my DBR-process.

3.5.1 Transcription

In order to make the interview- and workshop audio files as suitable for analysis as possible, I transcribed all from oral to written. The transcription in itself represents the first step in an analysis, as it is unavoidable not to form initial codes when revisiting the data collections (Kvale & Brinkmann,

2009d). Moreover, transcription of the audio recordings heightens the reliability of the research, as it makes the content of the data collections transparent to the reader.

As all the interviews and the workshop were conducted in Danish, the transcriptions are likewise also written in Danish. The purpose of my transcriptions was to prepare the data for later coding and thematic analysis, which is why I only wrote down actual words and left out meaningless content like pauses, words of hesitation, laughter, etc. The process of converting the audio data into written words resulted in a total of 39 pages of transcription, which can be seen in Appendix 6-11 and Appendix 13.

3.5.2 Coding and thematic analysis

Within qualitative data analysis, deep and insightful interactions with the data are a prerequisite for data interpretation. The researcher is bound to employ imaginative insight to make sense of and interpret the data and generate theories (Maher, Hadfield, Hutchings, & de Eyto, 2018). A method for doing so is coding, which is a way to look at the data under scrutiny and simultaneously get an overview of the data (Tanggaard & Brinkmann, 2010a). For the purpose of analyzing and interpreting my transcribed data, I, therefore, coded my interview- and workshop data. The methods applied for doing so are described in the following.

Interviews

After transcribing all six interviews, I reread the data in an *interpretive* manner. Interpretive reading means that the reader constructs or documents their understanding of what the data means or represents (Mason, 2002). After reading through the data, I conducted a data-driven, inductive coding, which means I approached the data analysis with an exploratory attitude and without having determined codes beforehand. However, as I was guided by my pragmatic approach and my wish to answer my problem statement, I only picked quotes for coding that enabled me to move forward with my inquiry.

Then, I read through the codes multiple times and conducted a thematic analysis as described by Braun and Clarke (2006), in which I merged similar codes into themes and named them accordingly. However, as all six interview situations were conducted in a fairly structured manner based on the themes in the interview guide (Appendix 2), the themes that emerged from the coding were very similar to these. As described by Kvale and Brinkmann (2009, p. 151); “The more structured the

interview situation is, the easier it will be to conduct the conceptual structuring of the interview in the analysis". The interview codes and themes are found in Appendix 12.

Future Workshop

The workshop audio files were processed in a similar manner as the interviews with regards to transcription. However, as the workshop participants had already performed a thematic analysis of their post-it codes, my processing of the workshop data was conducted in a more deductive manner compared to the interview analysis. Instead of forming codes and themes through the transcription data, I entered the participants' post-it statements and themes into a scheme and then identified quotes that describe the participants' post-it statements. Further, I coded the criticism phase and the fantasy and realization phase from the workshop separately to better enable myself to see contradictions or new perspectives. The workshop codes and themes are found in Appendix 15-16.

3.6 Ethical considerations

When conducting research that involves human participants, the researcher is obliged to treat those in a respectful and ethical manner (Bordens & Abbott, 2011b). Therefore, the three fundamental principles from the Danish Code of Conduct for Research Integrity (2014) were considered in all phases of my research, which is; (1) honesty, (2) transparency, and (3) accountability.

The principle of h*onesty*, which ensures trustworthiness in research reporting, analysis, planning, and so forth, was followed in all phases of my inquiry. By integrating, reviewing, and referencing the work of other researchers within the field, I was able to be honest about how my research would provide significant and original insights without degrading the work of others in the past. Further, I ensured a well-planned and well-structured reporting of both my data collections and data analyses, in which I was open about how my role in the research affected the research design. Finally, I was honest and respectful towards the participants involved in the research by informing them that their contributions were voluntary, and by providing them with sufficient information about the study's purpose and use of their data.

The *transparency* in my research, which refers to the credibility in the scientific reasoning, is specifically evident in my reporting of the methodology that founded my research, as I incorporated visual representations of the different phases in my study and described every element in detail. This was intended to make the research progress more transparent for the reader. Further, I

ensured transparency in my analyses of the results by incorporating direct quotes and references to the appendices with the interview- and workshop transcriptions, which enabled the reader to control that all findings were well-founded.

To meet the principle of *accountability* in my research, I ensured that any new knowledge created would be valuable for both the participants, other researchers within the field, and for the Information Studies program at AAU CPH (§1.2). Moreover, I consulted my supervisor when in doubt about research regulations or integrity, which secured that my research and analyses stayed reliable and accurate. Finally, I ensured accountability by following the principles from the Danish Code of Conduct for Research Integrity (2014).

4. RESULTS AND ANALYSIS

In this section, I present and examine the results derived from the interviews and the workshop with the aim of answering my problem statement. The findings are supported by related work presented in §2.2 when relevant, to further signify the credibility of my research and its contribution to the field.

The section is divided into three major themes: (1) Current practices; (2) Challenges of implementing Design Thinking; and (3) Changing the situation. In each theme I examine and answer a research question; in theme (1) I examine RQ2, in theme (2) I examine RQ3, and in theme (3) I examine RQ4. The research questions are presented in each theme. Theme 1 mainly consists of results from my interview analysis, whereas both interview and workshop analysis results were triangulated in theme 2 and 3. By triangulating the interview findings with the workshop findings, I performed a validation of the identified problem, which is part of a DBR-process (Gynther, 2010).

Each theme contains direct quotes from each participant from the six interviews and the workshop, that are used when relevant to support findings from my analysis of the results. For this purpose, the chosen quotes have been translated into English to the best of my ability. To consult the original quotes in Danish, please refer to the transcriptions in Appendix 6-11. The demographics of the participants were derived from the interviews and illustrated in Table 1 below.

Participant	**Age**	**Gender**	**Job title**	**Seniority**	**Experience with DT**
P 1	29	Female	Advanced business consultant	1 year	Novice
P2	34	Male	Business consultant	1 year	Novice
P3	29	Male	Business consultant	4 years	Novice
P4	28	Female	Consultant	2 years	Intermediate
P5	53	Male	Senior User Experience Specialist	3 years	Intermediate
P6	40	Male	Senior User Experience Specialist	5 months	Expert

Table 1: Participant demographics

4.1 Current practices

In the first phase of my DBR-process, I set out to investigate the consultants' work practices in relation to how they currently organize processes when working with clients, which methods they use for this purpose, how they prefer to learn new methods, and, finally, what they understand by Design Thinking. Therefore, the aim of this theme was to examine RQ2: *Which methods and processes do the consultants in NNIT currently use in their work practices?*

4.1.1 Roles and processes in projects

Business consultants

In the initiation of each interview, I asked the participant to describe their job title, roles, and responsibilities, along with how they approach a project and plan the process. When coding their answers, it became clear that the participants with a Business Consultant title (P1, P2, and P3) often take the role as the project manager or have a processual overview. For example, P1 mentioned that her role is; "(...) primarily to project lead and ensure that it [the system, ed.] is set up in the right way" and that the job mostly includes "(...) a lot of project management and looking at processes; how can we optimize them?" (Appendix 6). Similarly, P2 stated that; "As a business consultant you have insight into all the processes in the company" (Appendix 7), and P3's role is; "(...) to ensure that we have a time schedule and stick to it. I am the bottleneck for all data, so the project manager can focus on project managing" (Appendix 8). Thus, it seems that the participants who are business consultants often function as either project leads or project assistants.

When asked to describe a specific project and the optimization hereof, P1 stated that she and her project team took an explorative mindset; "And then we started with this very exploratory phase where we tried to open up our knowledge, and uncover everything that needs to be uncovered" (Appendix 6). Further, she described that the exploratory phase contained stakeholder interviews and desk research, that she always regards the stakeholders and their needs, and that "(...) no matter which methods you use for it, it is an analysis that is intended to result in specific recommendations" (Appendix 6). A similar statement was found in the coding of the interview with P2, who stated that the approach to a project "(...) is dependent on which client it is. If it is very exploratory, it is fine to conduct a brainstorm and some post-its and get some thoughts on the table" (Appendix 7). Thus, it seems that "exploratory" as explained by the participants means investigating specific things and getting some "thoughts on the table", which is facilitated by the use

of specific methods. When describing a specific project, P3 expressed that he had a product-oriented focus and a non-linear process; “my method was to constantly say that I need to have many iterations and have the possibility to change it all the way through” (Appendix 8).

UX consultants

When asked to describe her role in a specific project, P4 stated that she never adopts just one distinct role, but that “(...) the type of projects have been so different, so you can not really say it” (Appendix 9). She has previously had the role as the project manager, and in her current project she has a “(...) UX- and business architect-role” in which she “(...) have had a dialogue with the developer and have the end-user focus both in interviews and from the client’s perspective, but also to think the entire technical design” (Appendix 9). A person with a more specific role is the Senior User Experience Specialists, P5, who stated he is “pure UX”, which means he “(...) investigates the context of use, which product to produce, and who will use it” (Appendix 10). Thus, it seems that P5 had a product-oriented focus similar to the Business Consultant, P3. Another similarity between these two consultants’ reflections about their processes is in their description of working iteratively, as P5 stated that; “We worked in an agile way, which means that we quickly started making an interactive prototype, which we tested and refined through multiple iterations” (Appendix 10). Both P4 and P5 connected user-centricity to the description of their role on projects, which coincides with their title as User Experience consultant, whereas P6 did not have any role or process in projects to describe due to his short time in the organization. However, P6 was hired to work with Design Thinking in the department, which he has great experience with from previous jobs.

When looking through the participants’ descriptions of their processes, I noticed that they use words like “exploratory”, “iterative”, and “end-user focus”, which are also used to describe the essence of Design Thinking in a management context (Liedtka, 2018; Brown, 2008). This may indicate that using Design Thinking as described in a management context will not be too unfamiliar for the consultants if they already practice what the literature preaches, however, their understanding of the words and the concept requires further investigation before this hypothesis can be accepted. Therefore, I utilized the interviews to investigate the participants’ current perception and understanding of Design Thinking. The results therefrom are presented in the following.

4.1.2 Understanding of Design Thinking

From my coding of the interview transcriptions, I found that all six participants have different understandings of Design Thinking. P1 describes Design Thinking as "(...) a set of tools or methods that makes everybody capable of being creative or coming up with ideas" (Appendix 6). A similar distinction was made by Tschimmel (2012), who describes Design Thinking as an effective toolkit for innovation. Furthermore, P1 described how she learned about Design Thinking in her previous job, and that "(...) an important element in Design Thinking is also this user-centricity, and in my old job we often talked about customer journeys and how to get the user more centered" (Appendix 6). User-centricity is a recurring theme within both practical and scholarly literature on Design Thinking (Brown, 2008; Carlgren el al., 2016), and it was also mentioned by P4, who further regards "(...) that you get things tested before you build anything" (Appendix 9) as an important part of Design Thinking.

Furthermore, Design Thinking was described as a way to "(...) figure out what the needs are, which values to fulfill, and which strategy to pursue" (P2, Appendix 7), and as a method for "(...) taking one step back and thinking problem-oriented, meaning, looking at what it is that causes the whole problem" (P3, Appendix 8). Thus, P2 and P3 regard Design Thinking as a method for problem framing, which Dorst (2011) also regards as one of the essential elements of the approach.

The last two participants describe Design Thinking in processual terms. P5 regards Design Thinking as "old wine in new bottles" taken into an organizational context, describing that "(...) the approach we have as UX designers has been mainstreamed with Design Thinking and applicable for processes" (Appendix 10). P6, who has the most experience with Design Thinking out of all the participants, described it as "Fast concept development", to which he elaborated; "(...) fast, as in you have a lot of iterations that are fast. You have to quickly gain knowledge about some things, but the process is the same as when working slowly" (Appendix 11). From my literature review, I found that scholars and practitioners within the field also regard Design Thinking as a process (Dunne, 2018; Brown, 2018).

From the analysis of the participants' description of Design Thinking, I conclude that all six were able to answer my question about what Design Thinking is. As I also concluded from my literature review, there seem to be different understandings among the participants of what Design Thinking actually entails. Unfortunately, I did not question why or from where the participants had their specific understanding, which makes it hard to further analyze this topic.

As the purpose of the interviews was to establish a context for future implementation of Design Thinking as part of their work practices, I found it relevant to question them about their current use of methods and their preferences for learning new methods. The results from this part of my interview analysis are presented in the following.

4.1.3 Learning and using methods

When reflecting upon methods and processes and their usefulness in projects, P1 stated that most of the time she uses methods without thinking about it. However, she thinks that methods and processes are useful tools for quality ensuring a project, as they provide a checklist or a step-by-step guide for a process, which ensures that they "(...) get all the way around" (Appendix 6). P1 further stated that a method or a process is good when it is "so simple that there is no doubt about how to use it" (Appendix 6). In my analysis of the participants' description of their process for finding and learning a new method, two themes emerged from their statements; (1) search procedure; and (2) preferences for the presentation.

Search procedure

When arguing how they look up new methods or processes, P1, P2, P3, P5, and P6 stated, that they use Google as a search engine to search for new methods. As the only one, P4 did not mention a search engine but rather that she prefers to learn new methods by watching someone use them and have them explain it to her.

Preferences for the presentation

When finding a method she would like to learn, P1 prefers having access to a case-example or to take a course, because "(...) you try to make it specific, so it does not just become a description of some method but rather a visualization of how it works in practice" (Appendix 6). Specific examples of use were also mentioned as the preferred method by P3, P4, P5, and P6, to which they argued that the example could both entail watching someone else use the method or process or to follow a course either online or offline. Especially P2, P3, and P4 highlighted the importance of getting to try out the method own-handedly after learning about it, as argued by P4; "(...) if I do not practice it, I will not learn it" (Appendix 9).

4.1.4 Summary of findings

From the interviews with the participants, I deducted several important findings about their current work practices and the possible problems at hand. Firstly, the consultants with a Business Consultant-title often function as project lead or project assistant in projects, which arguably means they are used to viewing projects from a higher level than the UX consultants, who mostly work on projects on a more operational level. Moreover, some of the consultants used similar words to describe their project approaches as used in Design Thinking literature, which may indicate that the implementation and use of Design Thinking will not be completely unfamiliar for them. When asked about what Design Thinking entails, the consultants had different understandings; some saw it as a method for framing problems, some saw it as a user-centered method to pinpoint the users' needs, and others described it as a method for concept development. None of these descriptions are untrue based on the literature on the subject (§2.2). Finally, I found that when initiating the learning of a new method or process, five out of six participants would search for the specific method on Google. The same number of participants argued that to actually learn how to use a method, they prefer accessing a use case example through an online or offline course.

4.2 Challenges of implementing Design Thinking

In this section, I outline the four challenges that affect the implementation and use of Design Thinking as concluded by the workshop participants, P1, P2, and P3. Thus, the aim of this theme is to answer RQ3: *Which challenges do the consultants experience as related to the implementation of Design Thinking in their work practices?*

The four presented challenges are based on the participants' grouping of the post-it statements they noted during the criticism phase in the workshop. However, I changed the names to represent the specific challenge or critique point presented within. The challenges are not numbered in a prioritized order, and all post-it statements can be seen in Appendix 14.

4.2.1 Challenge 1: Too fast in "solution mode"

All three participants expressed that when working on projects, the teams tend to move to "solution mode" too quickly. Their work is often limited by a strict deadline, which P2 argued results in that; "You do not have time to go through things, so you just take the easiest solution that presents itself" (Appendix 13). To this statement, P1 provided a practical example; "I often think that when you are part of a brainstorm or sitting with a problem or a task, we have a tendency to quickly move to solutions instead of making sure which problem we are facing" (Appendix 13).

Further, the consultants stated that projects are often locked on one solution; "Either it is something that we came up with or the client who wants something specific. They have an idea about what they want when they contact us" (P2, Appendix 13). To this, P1 expressed a wish to be able to challenge the clients' perception of the right solution; "It might be that the client thinks it is the right thing, but we would like to go in and challenge that. We must be brave enough to do so, and the client must too" (Appendix 13).

4.2.2 Challenge 2: Knowing and learning about Design Thinking

Another challenge in the implementation and use of Design Thinking is the lack of information about the concept. P1 argued, that Design Thinking has not been officially introduced to the team yet, and that; "It might cause the distribution [of Design Thinking, ed.] to be challenging, and it may be that we are not doing it just yet" (Appendix 13). Furthermore, P2 stated, that he is missing knowledge

about the concept, and that; “The learning material is missing, because if I want knowledge, where do I go?” (Appendix 13). The same participant also argued, that he finds it hard to pinpoint what he can use Design Thinking for, which is easier to do when it has been properly introduced.

Besides absence of information about the concept, the participants stated that the use of Design Thinking is challenging because they lack hands-on experience with it. P3 stated, that; “I have read a lot about it, but for me, it is a tool that seems very abstract” (Appendix 13), to which he added that a lack of hands-on experience may lead to wrong use of the approach. P1 also empathized a lack of training in the tools for conducting workshops and brainstorming sessions as a challenge; “We often brainstorm, but we do it like “does anyone have any ideas”. It is not where you use specific methods for it”.

4.2.3 Challenge 3: Missing alignment of value for clients

An element that was pointed out by the participants when regarding the challenges of implementing Design Thinking is that clients do not understand why it is relevant. Even though the participants see the added value of the fact that Design Thinking proposes a non-linear process that enables you to “constantly re-frame to avoid it getting too expensive and time-consuming” (P3, Appendix 13), it may also present obstacle in the implementation of it, as “(...) there might be essential deadlines that limits the ability to go back” (P1, Appendix 13). Further, the iterative nature of the process makes it time-consuming, because “(...) you spend a lot of time on a workshop and to research the needs and to get to a place where you can say “there, now we can get started”” (P3, Appendix 13).

Thus, it seems that even though the participants argue that Design Thinking is a great method for problem framing, the non-linear approach also becomes too vague in client-oriented projects with regards to assessing when they are finalized, as stated by P3; “(...) you can not just say that it takes a month and then we are done” (Appendix 13). The clients need to understand what it means when the consultants say that they are thinking as designers, they need to see the value of it and that “(...) it is not some fancy word but actually really valuable” (P3, Appendix 13).

Another element in the challenge of convincing the clients that Design Thinking is valuable is their inability to see the added value of bringing real end-users into the process. Further, the user involvement in itself presents an obstacle for the consultants, as “(...) you often lack access to the end-users or acceptance of that we need to spend time involving end-users” (P1, Appendix 13)

4.2.4 Challenge 4: NNIT change-readiness

The final challenge deducted from the workshop regards the NNIT "Design Thinking-readiness". Within this challenge lies the fact that the participants do not feel like management has supported the implementation of Design Thinking, as stated by P2; "It is not like anyone has been out saying "NOW we are working with Design Thinking", and that we get time dedicated for it" (Appendix 13). Furthermore, a point was made that Digital Together cannot stand alone in the implementation of Design Thinking in the entire NNIT, as they often work across departments and with different stakeholders.

The participants further argue that the challenge of implementing an agile tool like Design Thinking is fed by the rigidness of the organization. As stated by P1; "(...) sometimes we do not dare to go down that road because we get challenged on the assumptions that we already have" which results in "(...) you do not dare to say "kill your darlings" in this organization" (Appendix 13). In the interview, P2 also stated; "I do not think the organization is ready for it, so I think we need to explicitly show where and how it [Design Thinking, ed.] can be used" (Appendix 7). Further, the implementation and use of Design Thinking has to fit into an already implemented agenda set by the management, which creates some limitations; "We might say in Digital Together that now we are working with Design Thinking, but we also work with a technological perspective" (P2, Appendix 13).

4.2.5 Summary of findings

The consultants who participated in the workshop experienced four challenges that each influences the implementation and use of Design Thinking in their work practices. Firstly, projects are often tied by strict deadlines, which means the consultants move quickly to "solution mode" and are not able to either challenge the clients' assumptions or the framed problem at hand. Next, missing knowledge about and hands-on experience with what Design Thinking actually entails presents a challenge, as the consultants struggle to pinpoint how and where it can be useful. Another challenge is present in convincing the clients that projects should use Design Thinking, as the non-linear process, user-centricity, and iterative approach will presumably affect the consultants' ability to keep important deadlines. Finally, the consultants highlighted the rigidness of NNIT as a challenge, as they doubt the organization is ready to challenge current assumptions, dedicate the time to implement a new approach to projects and to "kill its darlings".

4.3 Changing the situation

The following section presents three overall themes that encapture the changes proposed by the participants in the workshop. The aim of this theme is to answer RQ4: *Which needs do the consultants have in relation to implementing Design Thinking in their work practices?*

The three overall changes are based on the participants' grouping of the individual changes they noted during the fantasy phase in the workshop (Appendix 14). The changes are supported by quotes containing the participants' reflections on how to realize the changes, which are not numbered in a prioritized order.

4.3.1 Change 1: Assigning dedicated time

The participants agreed, that if Design Thinking was actually intended to be implemented and used in the organization, the managers need to allocate dedicated time for it in the consultants' schedules. This entails both getting dedicated time to secure a change in the culture and in sharing knowledge, materials, and tools for using Design Thinking as described in the following themes, but also to sell out projects with dedicated time for using Design Thinking, to which P3 agreed; "We should sell it out as a part of what we do" and; "(...) like innovation, there needs to be time for it" (Appendix 13).

4.3.2 Change 2: Sharing Design Thinking knowledge and values

Another change that needs to be implemented before Design Thinking can become a part of the consultants' practices is to start sharing knowledge and experiences about it, to produce learning material for the purpose, and to produce communication material for external use. According to P2; "There needs to be Design Thinking-communication for external use (...). Then, Design Thinking will not have to be justified either internally or externally" (Appendix 13). In the interview, P2 stated that he thinks Design Thinking can be used "everywhere", but that; "if I go to a meeting tomorrow, I will not just be able to say let us use Design Thinking. I need a description of where in the process it can be used" (Appendix 7). Thus, he needs further introduction to the methods within Design Thinking before being able to use them.

Both P2 and P1 would like to have access to previous use cases or projects in which Design Thinking was used and created provable value, a PowerPoint presentation, or other specific communication material for learning purposes. In both the interview and workshop, P1 stated that; "We need to have a Design Thinking inspired toolbox that everyone can use without being experts in the area" (Appendix 6 & 13). As an argument for creating a toolbox or a database, P1 stated that; "(...) what I could use is a consulting playbook, in which you could go and look up and say, if I am going to investigate this, then I can use these methods" (Appendix 6). However, P1 argued that a toolbox cannot stand alone, but that a course or other training is necessary to learn how to use Design Thinking. P3 also expressed the value of a place to find specific tools for Design Thinking; "I think it would make it more approachable because it is a very abstract mindset" (Appendix 13).

Further, P3 suggested to start by solving an internal problem by using Design Thinking, which will both train the consultants in using it and create specific cases, from which they can pinpoint just where and how Design Thinking provides value; "The hardest part is to get management on board, and they are not going to agree on it before they can see where the value is in it" (Appendix 13). In the interview, P3 also mentioned that he would hesitate to experiment too much in a client-based project (Appendix 8).

4.3.3 Change 3: Changing culture and mindset

Lastly, the consultants argued that the culture and mindset in NNIT need to be adapted to meet the iterative nature of the process and to phase out the current culture about picking the easiest solution first. However, to change the culture and mindset, which especially regards management; "It is about that management knows there is an attention point called Design Thinking, which needs to be part of everything and that there is the time for it" (P3, Appendix 13). This point was later followed up by P2, who stated that; "It is definitely important that the organization is behind this, and that it is not just us advertising it to the customers" (Appendix 13). This need was also concluded by Dunne (2018), who found that the support of a senior-level 'sponsor' or CEO is critical when establishing a design program.

As a solution to the "show me the money"-problem as mentioned in the challenges (§4.2.3), P3 suggested that NNIT Digital Together should have "Design Thinking as a Service", which entails helping customers to explore whether they are solving the 'right' problem; "Then we could come out and say whether the solution they produced is actually a solution to the problem they think they have" (Appendix 13). However, when discussing how this change should be realized, P1 expressed

skepticism regarding selling Design Thinking as a product; “I have a hard time seeing how Design Thinking in itself can be a service we provide because it is a method” (Appendix 13). P1 argued, that Digital Together should not necessarily call their way of working for “Design Thinking” but rather for their own process, which is part of their culture and mindset; “(...) that is change-ready and dares to challenge assumptions” (Appendix 13). As stated by P1; “We need an “it is allowed to fail”-culture” (Appendix 13).

4.3.4 Realizing the changes

After discussing and grouping the changes, the participants were asked to discuss which changes to focus on first. In this discussion, P2 reflected upon the co-dependency of the three changes, as illustrated in figure 9; “We need the dedicated time and training, but we do not have the mindset for it. On the other hand, if we have the mindset and the time for it, we do not have the right training” (Appendix 13). This co-dependency underlines the wickedness of the framed problem; there is not one definite solution but there might be several good ones.

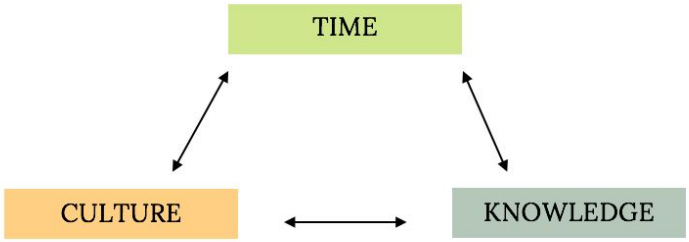

Figure 9: Co-dependency of the three changes

Based on P2’s statement, it seems that all three changes can not be realized simultaneously. When arguing which change to focus on first, P2 stated that if the consultants have the right knowledge and culture or mindset, the time will eventually be allocated. Further, P2 argued that; “We cannot change a culture without knowing anything about it [Design Thinking, ed.]” to which he later stated, that by knowledge he did not mean that everyone should know everything about it, but rather to establish a shared terminology; “If we just go tell people to work creatively and practice Design Thinking, they will think “what exactly should we do?”” (Appendix 13). Thus, establishing a shared terminology and sharing knowledge would be the place to start according to P2, which is illustrated in Figure 10.

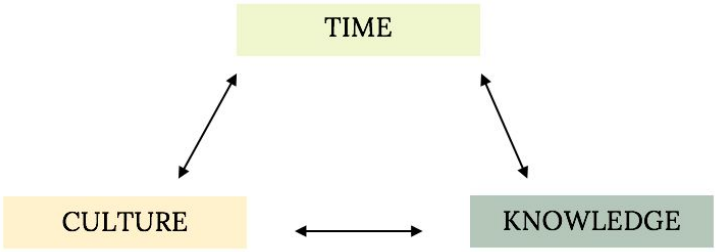

Figure 10: Implementing knowledge

On the contrary, P1 argued that it is more important to establish the right mindset before becoming an expert on the subject. To her, it would be beneficial if a mantra or a vision was created, like; "(...) make at least three mistakes, or something you can relate to", as she knows that; "it is not everything you can take through this process, so we have to be pragmatic about it, but there are some basic elements that we can say "this we always do"" (Appendix 13). To further secure the realization of the use of Design Thinking, P1 suggested that; "We also need Design Thinking ambassadors or coaches, so you are able to get help in projects to avoid falling back to the old methods we used to use" (Appendix 13). When following up on this, P3 stated, that Design Thinking should be a part of every project, to which P2 argued, that; "(...) it should be how we interact on an everyday basis. That way it becomes part of the culture and not just a checklist" (Appendix 13). The focus on cultural change is illustrated in figure 11.

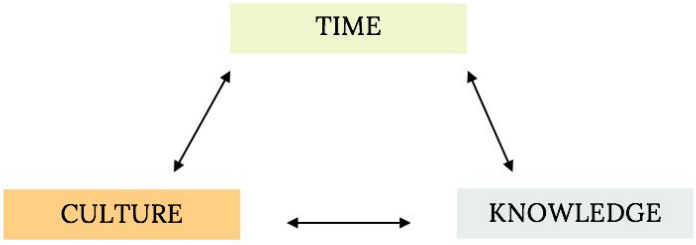

Figure 11: Implementing cultural change

As the final note, P2 highlighted the importance of initially making a plan for the implementation; "(...) the day after tomorrow we might risk that some of the ambassadors quit their jobs here. Therefore, it is important with a plan for how to get it [Design Thinking, ed.] anchored in the organization" (Appendix 13).

4.3.5 Summary of findings

After defining the four challenges in implementing and using Design Thinking in their work practices as-is, the consultants defined three changes that will accommodate the challenges and enable them to use Design Thinking in their future work practices. Firstly, the consultants argued that they should get dedicated time in their schedules to secure a change in the culture and to share knowledge and experiences about using Design Thinking. Further, to make the abstract concept more approachable, the consultants expressed a need for a place where they can easily find cases, tools, and presentations about it, which will also help get management onboard the Design Thinking idea.

Another and very important change according to the consultants is a change in the culture and mindset in NNIT. The organization needs to accommodate the iterative nature of the process and to phase out the current culture about picking the easiest solution first. However, this can only be done if the managers are onboard and allow the consultants to make mistakes and challenge assumptions.

When discussing how to implement the changes, it was argued the three changes are co-dependent as the culture and mindset can only be changed if everyone shares the same knowledge and terminology about Design Thinking and get the time to learn it. Another argument was that a cultural change should be the first focus when implementing the changes, which initially could consist of a mantra or choosing Design Thinking ambassadors.

5. DISCUSSION

As in any project, it is important to reflect upon the results, the process, and how limitations have shaped all three throughout. Therefore, I use the following section to discuss the main findings and limitations in light of the thesis' problem statement; *How do the consultants in the Digital Strategy, Innovation & CX team currently work in projects, and how can Design Thinking be implemented and used in their future work?*

5.1 Research findings

From my results and analysis, I found that in order to make Design Thinking a part of their future work practices, some of the processes that currently characterize their work practices need to be changed. The different changes regard three aspects; (1) culture; (2) knowledge; and (3) time.

The most important aspect mentioned by the consultants is the culture and mindset in NNIT. Several of the consultants expressed that the organization is rigid and prioritize efficiency over challenging its assumptions. Further, the consultants all shared the experience that none of the managers in the department have announced the utilization or integration of Design Thinking in the consultants' work practices, which posed an obstacle in their implementation of it. Rauth et al. (2015) argued, that to avoid making Design Thinking a mayfly in the organization, the managers need to be onboard and secure acceptance and support amongst co-workers. A limited understanding of what Design Thinking entails can lead to companies implementing it for the wrong reasons or with problematic expectations. Therefore, it is crucial that the executive managers clearly define the purposes for implementing Design Thinking, which is one of the major changes the consultants asked for; they need to know why, how, and when to use it.

From the analysis, I also found that many of the consultants are restricted by a tight deadline in their projects, which often results in that the easiest solution gets picked first as the consultants do not have the time to explore all possible solutions. Thus, it seems that their current practices and work on client's projects do not allow much time for reflective practices, which Schön (1983) presents as a prerequisite for effective work. From my literature review, I likewise found that Design Thinking entails taking an abductive, hypothesis-driven approach (Liedtka, 2018; Dunne & Martin, 2006). Based on the consultants' descriptions of their current work practices, in which they

mentioned that they tend to move “too fast to solution mode” (§4.2.1), it can be argued that they need to establish a different approach to projects in order to really implement Design Thinking, in which ideas, concepts, or new thoughts cannot be proven in advance (Dunne & Martin, 2006). However, the consultants expressed concern regarding getting clients to accept this new, exploratory approach to problem-solving. According to Kolko (2010), clients often struggle to see the value of design and Design Thinking, in which the “freewheeling nature” might impose a cultural barrier (Dunne, 2018, p. 13). So how can the consultants convince their clients that they should allocate more time and resources for Design Thinking? What if the clients are happy with the way projects are run as-is? This is one of the reasons why the problem is wicked; because both managers, consultants, NNIT as a whole, and the clients are stakeholders, it becomes troubling to accommodate everyone’s needs and resources at once.

Another important aspect that implicates the integration and use of Design Thinking in NNIT is a lack of shared repertoire and knowledge about its contents. Birkinshaw, Hamel, and Mol (2008) argued, that the ambiguity and uncertainty connected to the introduction of a new concept in organizations stem from a lack of understanding of the new concept. From the interviews and workshop, I found that the consultants struggle to clearly define what Design Thinking is. They feel restricted in implementing it in their work practices and express a very clear need for somewhere to find specific information that prevents them from using it wrong. Moreover, previous research showed that novice design thinkers often spend a long time on problem-framing without regarding the broader perspective of the situation (Razzouk & Shute, 2012). In my interviews, especially P3 expressed that Design Thinking was a method for problem framing (Appendix 8). To avoid similar novice behaviors in the future while accommodating the consultants’ needs, the managers need to enroll Design Thinking properly into the department and, simultaneously, provide learning material to the consultants.

5.2 The wicked metaphor

As presented in §1.2.1, I initially approached my inquiry with an assumption that my purpose was to design a toolbox that would enable the consultants to implement and use Design Thinking in their work practices. The toolbox-idea was strong, as the idea had repeatedly been approved by my boss and other colleagues from the department. Thus, my problem setting was mediated by the story people, i.e. my boss, told about the troublesome situation, as argued by Schön (1993, p. 138); “When we examine the problem-setting stories told by the analysts or practitioners, it becomes apparent that the framing of problems often depends upon metaphors underlying the stories”. In my case, the

metaphor was a toolbox; a technology that most people would associate with entrepreneurship or engineering. Therefore, I selected the toolbox as my main attention-point, to which I named things to focus on in the interviews, so the results would be valuable for my further development of the metaphor.

As mentioned in §3.1.1, the determination of a problematic situation is an iterative, ongoing process that cycles between framing the situation, generating hypotheses and evaluating these through practice (Dalsgaard, 2014). When conducting and analyzing the interviews, I realized that the problem was more nuanced than I had initially assumed; the consultants are restricted by multiple stakeholders, deadlines, and cultures, which means that making a change in their current reality and adopting a new approach to projects is not a simple task. That was when I realized the wickedness of the problem, and that I needed to zoom out and reframe the situation; my focus should be on the users of the concept and not the product. As argued by Coyne & Snodgrass (1995, p. 31); "(...) if we are uncritical of the metaphors that prompt our action, we may miss opportunities for useful action". Thus, my reflection-on-action and my pragmatic, iterative approach enabled me to reframe the situation in which I named the problem to focus on.

5.3 Research quality

Within DBR, one of the central issues regarding the research quality is replicability. Because of the qualitative nature and contextual approach, it becomes difficult to replicate findings (Barab & Squire, 2004). As in all research that is based on humans, the results in my research are bound to the time and context within which they were gathered. If the same research was conducted in months from now, there is a great chance that the results would deviate, as all social research is situated and hard to replicate. Therefore, the theories developed from my research are not fixed or stable, but they should be judged on the basis of practice, which means that they are always in the making

In this project, the small amount of recruited participants is also a factor that both affects the replicability and external validity of the results. My use of the purposive sampling strategy poses a disadvantage due to its subjectivity and, thereby, it is prone to bias. Furthermore, the small amount of participants affects the generalizability of my investigations, as it does not allow me to form conclusions that are generalizable to the entire population and similar setups in other organizations. I do, however, believe that my findings are representative of the Digital Strategy, Innovation & CX team in the context of investigating how Design Thinking can become a part of their practices.

When regarding the validity of my research, several elements implicated the quality. First, my initial scope of the problem poses a bias to the results, as the interview guide was developed with a toolbox in mind and not as an exploratory investigation of the consultants' current practices. I was very keen on investigating their use of and knowledge about Design Thinking methods and methods in general, as I wanted to establish a foundation for the design of a toolbox. Therefore, I found the results from the interview analysis rather insufficient to fully highlight all important aspects of the new focus of my investigations. For example, when regarding the participants' current practices it would have been useful with a more detailed description of their current approaches to projects, which I did not pay adequate attention to in the interviews.

Second, my dual role as both researcher and employee in the company affected the validity of my results as well. When interacting with my colleagues in the role of the Student Assistant, they often asked about my thesis and its subject and process. As my initial focus was the development of a toolbox, this subject was frequently mentioned at the beginning of the process. Therefore, these interactions might have influenced my research of the re-framed problem, as the consultants were most likely biased by my old focus, which P1's repeating statements about the need for a "toolbox" might indicate (§4.2.2).

Thirdly, the validity of my results was arguably affected by my inability to stay open to the situation during the interviews. My experience with conducting interviews is rather limited, which might cause that I did not deviate as much from the interview guide as the semi-structuredness and openness of the method enables. I did not pursue what in hindsight seems like evident clues or ask follow-up questions to statements that needed elaboration.

Finally, the use of EducationLab's processual model as the frame for my research design might have limited my focus and, therefore, the results of my research. By using a model in which each phase has specific goals and unique methods associated, I might have narrowed my focus and, therefore, the reliability of my results.

5.4 Recommendations for future work

Many opportunities for improving and extending the scope of this research have been left for future research due to time constraints in this project. Therefore, I highlight several aspects that I deem relevant for advancing the findings within the scope of this thesis.

1. When collecting data, I only focused on recruiting consultants who were intended end-users of Design Thinking. However, both the literature and the research results indicate that the managers' support and a clearly defined purpose of using the method are instrumental for successful implementation. Therefore, to further secure the implementation and use of Design Thinking in NNIT, the managers' perspectives should be included in future research. Further, as Design Thinking is intended to be used across the entire department, all Digital Together-employees' needs should also be investigated and taken into consideration.
2. Throughout the analysis of the data, I several times experienced that more detailed insight into the consultants' current work practices and approaches to project processes would have been beneficial for the validity of the results. Further, by mapping out the consultants' current practices in greater detail, it will be easier for experienced designers or the managers to pinpoint just where designerly approaches can be used. Therefore, I propose a new iteration in the context-phase of the DBR-process, in which the existing results would be triangulated with new, qualitative data. As the research in this thesis focused on the consultants' goals and attitudes (§3.1.2), future research should focus on the consultants' behaviors. For this purpose, the use of ethnographic research methods like observations or contextual inquiry will be useful as they produce less subjective data than interviews.
3. While the results found in this thesis indicate that more research needs to be conducted regarding the consultants' practices, the results also show that there exists a prominent need for specific learning material accessible for the consultants. Therefore, I propose future research on how such learning material can be designed, and on whether a technology can support the consultants' implementation and use of Design Thinking.
4. Finally, this thesis was limited to only include literature and theories on how Design Thinking can be used in an organizational context. However, from the literature review, I found that several researchers within the field utilized theories on learning and innovation management to highlight their findings. Thus, future research might benefit from a similar approach.

6. CONCLUSION

The prevailing aim of this thesis was to answer the problem statement: *How do the consultants in the Digital Strategy, Innovation & CX team currently work in projects, and how can Design Thinking be implemented and used in their future work?*

From my research, I found that the consultants in the Digital Strategy, Innovation & CX team do not approach projects in one specific manner; their process depends on the type of project and the specific client. Further, the consultants often take different roles depending on the project, which makes the structures of their work practices difficult to clearly specify. However, several elements characterize the majority of their client-based projects; first, the consultants tend to move too fast to "solution mode" as they are often limited by a strict deadline, which also results in that the easiest solution gets picked first. Furthermore, clients often have an impression of what the final solution should look like, which, together with the strict deadline, makes it hard for the consultants to be abductive, iterative, and explorative as the literature states Design Thinking entails. Finally, the consultants highlighted the rigidness of NNIT and its focus on efficiency, based on which they doubt that the organization is ready to change its culture, challenge current assumptions, dedicate the time to implement the new approach to projects, and to "kill its darlings".

From my research, I found that Design Thinking can be troubling to implement in organizations as its abductive, free-wheeling, and exploratory nature often conflicts with existing cultures and approaches. Therefore, three changes are instrumental when enabling the consultants in NNIT Digital Together to implement and use Design Thinking as a part of their future work practices. First, the managers should clearly define the purposes for implementing Design Thinking and specify both how and when the consultants should use it, which was also pinpointed as a crucial factor for a successful implementation of Design Thinking by previous studies. Further, the consultants need a shared repertoire and knowledge about the contents of Design Thinking, which will also be an aid in convincing clients about the positive implications of utilizing designerly problem-solving. The consultants further expressed the need for easily accessible information about Design Thinking like case- or success stories, tools, and presentations. Thus, further research is needed to investigate how this information should be designed.

The final and, arguably, most significant change to focus on according to the consultants is in the culture and mindset in NNIT. The organization needs to accommodate the iterative nature of the

process and to phase out the current culture about picking the easiest solution first. Moreover, the consultants need dedicated time to learn how to use Design Thinking. However, a cultural change can only be made if the managers are onboard and allow the consultants to make mistakes in projects that are client-based.

As the results show, there is not one simple solution to the formulated problem statement, which in fact makes it a wicked problem. In order to implement and use Design Thinking, the consultants must accommodate the needs of different stakeholders including their clients, their managers, and NNIT. This makes it difficult to pinpoint the exact sweet spot for Design Thinking, which is why further ethnographic research is needed to gather design knowledge and open up the design space.

7. LIST OF APPENDICES

8. LIST OF REFERENCES

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