Framing Design Thinking: The Concept in Idea and Enactment

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The concept of design thinking (DT) has emerged in management debates as promising innovation inspired by the way designers work. Despite the growing interest in DT, it is a difficult concept to study due to the lack of coherence between what DT ‘is’ in academic and practical terms. While there are numerous normative and often process-focused depictions of DT, they seem limited in their ability to account for what occurs in practice. Given the discussion of DT as a concept, and emerging discussion of its enactment, a framing is needed that acknowledges both aspects. This paper proposes a framing of DT that makes it researchable in both theory and practice, and discusses commonalities and discrepancies in how the concept is usually portrayed in the literature. The paper builds on an empirical interview study in six large organizations, which led to the development of a framework structure and the identification of five themes characterizing DT: User focus, Problem framing, Visualization, Experimentation and Diversity. Each theme is associated with specific principles/mindsets, practices and techniques. The main contribution of this paper is to propose a framework that includes DT both as an idea and as the enactment of the idea, inspired by the works of Latour.

Introduction

The innovation potential in design has been highlighted by several scholars (Bruce & Bessant, 2002; Von Stamm, 2003, 2004; Perks, Cooper, & Jones, 2005; Borja de Mozota, 2010). However, there has been little focus in innovation research on design as a critical activity (Hobday, Boddington, & Grantham, 2011; Noble, 2011), although there are some exceptions in the product development literature (Gemser & Leenders, 2001; Perks et al., 2005; Veryzer, 2005; Luchs & Swan, 2011; Micheli, Jaina, Goffin, Lemke, & Verganti, 2012). Some recent research initiatives suggest an increased interest among innovation scholars in the intersection between design and innovation. Examples are the discourse around design-driven innovation, which explores how design can enable companies to innovate in the meaning of products (Verganti, 2008), design as meaning-making (Jahnke, 2013) and concept-knowledge (C-K) theory (Hatchuel & Weil, 2009), which describes how companies need to work with the dual expansion of concepts and knowledge to become more innovative (Hatchuel & Weil, 2009; Masson, Weil, & Hatchuel, 2010).

There is increasing interest in design as a strategic resource in managerial debates. The concept of ‘design thinking’ (DT) has emerged as a human-centred approach to innovation based on the ways that designers think and work (Brown, 2008, 2009; Martin, 2009). Previous research on design and innovation emphasizes the significance of professionally trained designers (Kimbell, 2011; Jahnke, 2012) and their impact on innovation (Dorst, 2006; Lawson, 2006; Verganti, 2008). In contrast, proponents of DT – most notably from the design firm IDEO (Brown, 2008, 2009) and the Rotman School of Management (Martin, 2009) – stress that any discipline could take inspiration and learn from the way designers think and work, and apply this to their operations; not only their innovation efforts but also their strategy, new product development (NPD) or organizational renewal (Brown, 2009; Holloway, 2009; Brown & Katz, 2011; Frisendal, 2012). Further, these proponents argue that firms would learn how to address problems differently, come up with breakthrough ideas, find a better balance between exploration and exploitation (Dunne & Martin, 2006; Martin, 2009) and transform their business (e.g., Brown, 2008, 2009; Martin, 2009).
Of course such miracle cures can and should be questioned, and DT has been accused of being just the latest management fad (e.g., Nussbaum, 2011). Nevertheless, in the last few years, DT has been put into practice in many large organizations (Lafley & Charan, 2008; Holloway, 2009; McCreary, 2010; Martin, 2011) but to date there is very little empirical research on DT in organizational settings and only a limited understanding of what happens when DT is adopted in a company context (Carlsgren, 2013; Carlsgren, Elmquist, & Rauth, 2014; e.g., Carr, Halliday, King, Liedtka, & Lockwood, 2010; Lindberg, Köppen, Rauth, & Meinel, 2012; Seidel & Fixson, 2013). Deployment of DT has been described mainly in the business press and books written by practitioners advocating DT (Johansson-Sköldberg, Woodilla, & Çetinkaya, 2013). Therefore, the emergence of DT gives rise to several questions: how does DT relate to design in general, and to design research in particular? Is it a new way to design, or is it a new way to organize any activity that is not necessarily about design? Does DT offer something new compared to other approaches to managing innovation, creativity and user-centeredness?

In seeking to answer these questions, one issue is immediately evident: although DT seems to be growing in importance, there is little coherence around the concept among scholars. The term ‘design thinking’ is quite ambiguous, and is often a source of misunderstandings (see, e.g., Johansson-Sköldberg, Woodilla & Çetinkaya, 2013). Many academic publications on DT rely on popular descriptions of the concept provided by its main proponents (IDEO, Rotman, d.school at Stanford University) and in some cases the authors do not define it at all.

In order to advance our understanding of DT, a scholarly framing of the concept is essential. However, it has been argued that searching for a single meaning of the term would be to fall into an essentialist trap (Johansson-Sköldberg et al., 2013). Czarniawska and Joerges (1996) and others have proven that when an idea, such as about how to manage, is taken up by organizations, it often assumes different shapes through its situated use and adaptation to the local context (e.g., Zilber, 2006; Ansari, Fiss, & Zajac, 2010). Thus, to be able to investigate a concept such as DT in theory and in practice requires a researchable frame. To address this, the purpose of this paper is to propose a framing of DT that makes it researchable in both theory and practice. It also discusses commonalities and discrepancies related to how the concept is usually portrayed in the literature.

The paper is based on a qualitative inquiry into the use of DT in six large organizations claiming to use it. The investigation shows that current depictions of DT are limited in describing what is practised in the name of DT (Lindberg et al., 2012; Carlsgren et al., 2014), and that a conceptualization is needed that takes account of this variety. Inspired by the works of Latour (1986), as well as Feldman and Pentland (2003) on organizational routines as having an ostensive (the idea) and a performative (the enactment of the idea) dimension, we propose a framework that is adaptable to both these dimensions. In applying the framework, five themes were identified that characterize DT as a concept. The framework allows for the analysis and comparison of DT in the popular management discourse as well as in specific applications, thus allowing researchers to investigate the concept and its application in greater detail.

Previous Research

Ambiguity Around the Concept

There is a long tradition in design research of studying the practice of professional designers and architects (Simon, 1969; Schön, 1983; Rowe, 1991; Krippendorff, 2006; Cross, 2011). As this strand of research is sometimes also referred to as ‘design thinking’ (Liedtka, 2004, Johansson-Sköldberg et al., 2013), the label has caused some confusion. Johansson-Sköldberg et al. (2013) argue that research on design thinking can be separated into two major streams: (1) ‘designerly thinking’, which pertains to the design research tradition of studying designers and can be traced back to the 1960s, and (2) ‘design thinking’, which pertains to the concept that has emerged from more recent managerial debates. They note further that the two discourses are disconnected, and that there are few, if any, cross-references between the two fields. In this paper, we apply this distinction and refer to the current managerial discourse in using the term design thinking or DT.

In the managerial discourse, DT typically does not refer to classic design disciplines such as engineering design, industrial design or communication design; rather it is presented as a general human-centred approach to problem solving, creativity and innovation (e.g., Brown, 2008, p. 92). Brown (2008) also describes DT as a way to balance feasibility, viability and desirability, stressing that desirability is often overlooked from work on innovation and development. While on a general level there are some similarities in how DT’s main proponents portray the concept, they differ in relation to their perspectives and areas of application of DT even...
when citing one another. Tim Brown, who is the author of the most cited article to date on DT ('Design Thinking' in *Harvard Business Review*, 2008), defines DT in multiple ways within the same piece. For example, a ‘team-based approach to innovation’ (Brown, 2008, p. 86), a discipline (Brown, 2008, p. 86), and part of a development process (Brown, 2008, pp. 88–9). He further considers that everyone with the right ‘aptitude’ (Brown, 2008, p. 87) is capable of solving any kind of social problem using DT (Brown, 2008, p. 92). Roger Martin (2006) argues that companies should become more like design shops, with the main emphasis on the cognitive processes of designers, which in his view could also help managers. Martin describes these processes as ‘integrative thinking’, which is a way of thinking that ‘combines the generation of new ideas’ (abductive logic) ‘with their analysis and evaluation of how they apply’ (deductive, inductive logic) (Dunne & Martin, 2006, p. 518).

**Design Thinking Models**

Despite the ambiguity in these main works (e.g., discipline vs. approach vs. way of thinking), several renowned universities such as Rotman School of Management and Stanford University have introduced DT programmes (David Kelley, chairman of IDEO, is a professor at Stanford). Both these institutions have developed more normative models of DT centred on frameworks that feature a set of tools, and which emphasize a human-centred approach to innovation as well as interdisciplinary teams (Stanford d.school, 2010; Seidel & Fixson, 2013; Fraser, 2012). However, there are some differences.

The d.school at Stanford University (2010), which has been partly credited for the spread of DT, has proposed a stepwise, iterative process framework which is often depicted as a sequence of activities that can be interpreted as linear: *empathize* (data collection based on, for example, ethnographic studies), *define* (data synthesis to gain a refined problem understanding), *ideate* (suggest ideas for solving the problem), *prototype* (develop tangible and experienceable representations of the ideas) and *test* (with potential users). At the School for Design Thinking at the Hasso Plattner Institute in Potsdam, Germany (Stanford’s sister school), a more explicit depiction of the initial phase breaks empathize down into ‘understand’ and ‘observe’.

Heather Fraser from the Rotman School of Management proposed ‘three Gears of Design’ (2006, 2012). While the first two, ‘empathy and deep human understanding’ and ‘concept visualization’, are similar to the activities described by Stanford University, the third gear ‘strategic business design’ is rather overlooked in the Stanford model. However, while there are differences, these models all describe to a varying degree three stages of a process (data gathering, idea generation and testing), a common set of tools (Liedtka, 2015) and prescribed ways of thinking (e.g., Stanford d. school, 2010; Fraser, 2012, p. 20). Taken together, these accounts are illustrative of the ambiguity that characterizes the discourse around DT. First, there is inconsistency between the descriptions (despite similar definitions). Second, there is varying emphasis related to the level of detail, normativity and elements of DT. Third, it is unclear how the views of the different authors interrelate.

**Scholarly Perspectives on Design Thinking**

There are two main approaches among scholarly ways of depicting DT. The first and most frequent approach is characterized by reliance on practitioner descriptions of DT by focusing on a specific definition provided by one of its main proponents or on a specific dimension (e.g., the process) in the writings of multiple authors (e.g., Seidel & Fixson, 2013). However, some scholars, such as Liedtka (2015), have indirectly criticised a too narrow focus, suggesting that DT’s distinctiveness rather lies in the ‘bundle of attitudes, tools and approaches’ (Liedtka, 2015, p. 929).

In the second approach DT is discussed in light of design theory, in relation to previous research on designers and architects, and their ways of working and relating (e.g., Kimbell, 2011; Tonkinwise, 2011; Johansson-Sköldberg et al., 2013; Liedtka, 2015).

Given the anecdotal nature of the discourse, some scholars have argued for empirical research to investigate DT (e.g., Johansson-Sköldberg et al., 2013). Although these calls are fairly recent, there is some published empirical research. The earliest studies investigate how students work with DT (Meinel & Leifer, 2011; e.g., Seidel & Fixson, 2013), based largely on a practitioner’s definition of DT (e.g., Brown, 2008). Others investigate and report preliminary findings regarding DT in organizational settings. Carr et al. (2010, p. 62), for example, report preliminary findings regarding managers’ definitions of DT. According to the authors, there are ‘stark conceptual divides over the very definition of design thinking’ (Carr et al., 2010, p. 62). This is especially true when comparing what designers do or how designers use the techniques and methods taught in design schools to solve problems, to a design discipline independent, rigorous and universal approach to problem solving, using customer ethnography, visualization, pattern finding, ideation and rapid
prototyping. Lindberg, Meinel, and Wagner (2011) identify multiple ways that DT is used in one large organization. The authors argue that this is the result of individual managers’ interpretations, which are influenced by their previous experience and background, as well as their surroundings. Another study by Carlgren et al. (2014) proposes similar multiple definitions.

To summarize, many representations of DT in the literature are general, vague and sometimes ambiguous, and depict the concept as an approach to creative problem solving (Liedtka, King, & Bennett, 2013), or an abductive way of thinking (Martin, 2009; Leavy, 2011). Other representations are more precise and prescriptive, and describe various versions of a methodology or ‘typical process’ that could be used in multidisciplinary settings (Kelley & Littman, 2001; Brown, 2008; Stanford d.school, 2010). The result is multiple perspectives and a lack of consensus. Scholars interested in studying DT empirically often have to resort to one of these popular definitions, or make sense of numerous definitions that emerge from practitioners’ writings (e.g., Seidel & Fixson, 2013). An inclusive, empirically informed framing of DT is lacking, and is possibly hindering further research and contributing to fragmentation of the discourse.

Method

Research Design

To investigate how DT is applied and understood in practice, we designed an interview study to include companies that claim to use DT in various ways, and that had quite extensive experience (4–10 years) of DT. Given the limited empirical understanding of DT, the study was designed based on a qualitative, exploratory approach to data collection (Bryman & Bell, 2007). The investigation focused on identifying emerging patterns, and differences in what the interviewees described as DT. As there is no official list of companies that apply DT, we used purposive sampling to identify three pairs of companies: two with a product focus, two with a service focus and two software companies. Four companies were identified through articles in the business press, and two were identified through snowballing. The companies selected vary in size, with annual sales revenues ranging from US$4 billion to US$84 billion.

Data Collection

Data were collected mainly through semi-structured interviews, and wherever possible internal documentation. We conducted 36 interviews between 2011 and 2013, 11 during a pilot phase and then an additional 25. The interview questions revolved around the companies’ definitions of DT, its context of use, the initial motivation for adopting DT, and what the companies actually do, and experience as the main benefits and challenges related to using DT. We focused on how the interviewees perceived DT and how it is used.

A majority of the interviews were conducted by two of the researchers (26), and the remaining by one. Twenty-two interviews were conducted face-to-face, and 14 by telephone. The interviews lasted between 45 and 120 minutes and were recorded and later transcribed. Multiple perspectives were gathered (Eisenhardt & Graebner, 2007) from interviewees from different functions such as innovation and R&D managers, DT practitioners and people in the organizational interfaces. Table 1 summarizes the six companies and the interviews (face-to-face interviews in brackets).

Data Analysis

A Framework to Conceptualize DT

The first step in our analysis consisted of open coding of the interview transcripts, identifying statements linked to descriptions of DT and its use. The second step involved creating a structure to describe DT that was sufficiently flexible to account for the various ways of perceiving and using the concept (e.g., as a process, as a toolbox or as guiding principles for employees).

As noted by other researchers (Carr et al., 2010), there are many similarities with the concept of total quality management (TQM) introduced in the mid-1990s: apart from being loosely defined when first introduced to industry, both TQM and DT have been promoted as holistic approaches to management, and initially gained more attention from practitioners than scholars. Dean and Bowen (1994) proposed a conceptualization of TQM describing its principles, practices, and techniques, that has been used widely (Sousa & Voss, 2002). Given its similarities to DT, we adopted Dean and Bowen’s terminology to inform our framing of DT. We grouped and refined our first open coding of how DT is used as a concept, using structured coding based on Dean and Bowen’s conceptualization of the principles, practices and techniques. Dean and Bowen (1994) did not operationalize their dimensions but we introduced three qualifying questions to facilitate the coding: (1) Is this a general rule, or law, or corner-stone? If yes, it fell into the category of ‘principles’; (2) Is this a principle put into action in a specific way? If yes, it was categorized as ‘practice’; (3) Is this a
description of how to carry out a specific task? If yes, it was categorized as a ‘technique’.

It soon became clear that certain statements did not exactly match with our qualifying questions because they referred mostly to mental attitudes and ways of thinking. In order to take account of these ‘soft aspects’, we reassigned our first category to ‘principles/mindsets’, and added an alternative question: Is this a way to describe how an individual thinks or is inclined to think? If yes, the quote was included in the principles/mindsets category. Table 2 shows the basic framework structure.

Using this basic structure, we coded all the transcribed interviews for statements characterizing DT, sorting them by principles/mindsets, practices and techniques. Open coding of the statements within each of these categories identified a number of themes. For instance, ‘user involvement’ included activities involving users in idea generation, prototyping or concept evaluation (expressed in various ways). After several iterations between the empirical data and the emerging results, a pattern of five themes was identified, with each theme connected to a set of principles/mindsets, practices, or techniques.

Labelling the themes gave rise to much discussion over whether to retain the interviewees’ words, or construct labels that encompassed the interviewees’ statements to reduce ambiguity for researchers and practitioners. The latter position was eventually chosen, but Table 3
shows some of the alternatives considered. While the analysis was grounded in the empirical data, discussion of themes with other researchers showed that they were close to existing research streams in design theory. To allow for further exploration, the authors decided to frame and discuss the themes in relation to existing design theory, in line with a systematic combining approach (Dubois & Gadde, 2002). The label ‘Problem framing’ was influenced by this literature and our discussions and is descriptive while it provides a link to design theory.

In a final step, we verified the framework using within-case analysis (Eisenhardt & Graebner, 2007), in which we mapped examples of practices, mindsets and techniques from all six companies.

**Empirical Results**

To contextualize the findings, we present six brief stories that outline the different ways in which DT is utilized within the six companies studied (Table 4).

**Six Stories about the Use of Design Thinking**

**Kaiser Permanente** is a healthcare provider employing around 182,000, with headquarters in Oakland, California (US). Although innovation was described as central to the company, at the turn of the century there was no structured approach to innovation in healthcare delivery. DT was introduced in 2003 when the company began to collaborate with IDEO. The idea was that a small group of Kaiser employees would learn about the approach through a series of projects. Through iterations, the IDEO approach was adapted to the healthcare context and its prevailing evidence-based culture, including integrating influences from service and behaviour design and improvement science. DT is deployed as a process that includes a number of iterative phases: gaining empathy through ethnographic and participatory research, synthesizing insights, brainstorming and prototyping, pilot testing in the field and scaling up. Some of the techniques used include ethnographies, journey mapping, analogies and various brainstorming techniques. Prototyping was mentioned as fundamental to the approach, often performed through storyboards or skits, role playing or filming a scenario. The approach mostly involves a small innovation team practising large-scale innovation by targeting problems related to healthcare across the organization. The approach is participatory, involving a large number of frontline staff (e.g., nurses and physicians). DT is also used on a smaller scale (use of specific methods rather than the full process) for individual problem solving, everyday group work, meetings and, recently, in projects aimed at overcoming resistance to implementation of new ideas.

**CorporateSoft Co.** is a multinational software company with 50,000 employees which specializes in enterprise software. Inspired by an early article on IDEO’s approach to innovation, in 2005 one of the founders decided to introduce DT into the organization, facilitated by IDEO. In the face of competition from fast-moving start-ups, the company was keen to implement DT in order to develop a new way to innovate based on user-centeredness, and also to improve collaboration across functional silos. At CorporateSoft Co., DT is seen mainly as a process used to develop new software, services, strategies and business models. It is being applied by development and leadership teams in a variety of contexts, such as in consulting, innovation jams and facilitation of innovation workshops with clients. It involves six steps: (1) understanding the subject, (2) observing the user and his/her environment, (3) defining a point of view based on this understanding, (4) developing ideas based on the information gathered, (5) building prototypes and (6) testing these prototypes and their underlying assumptions. Based on this process, different groups within the organization have been developing distinct ways of working, combining elements of DT with approaches such as Lean Startup, Agile Development, and

<table>
<thead>
<tr>
<th>Themes</th>
<th>Alternative labels that were under consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>User focus</td>
<td>User orientation, Customer focus, human-centeredness</td>
</tr>
<tr>
<td>Problem framing</td>
<td>Unconstrained view of the problem, Question the problem, Problem exploration, Problem focus</td>
</tr>
<tr>
<td>Visualization</td>
<td>Prototyping, Making tangible</td>
</tr>
<tr>
<td>Experimentation</td>
<td>Iteration and testing, Action orientation</td>
</tr>
<tr>
<td>Diversity</td>
<td>Collaboration, Systemic perspective</td>
</tr>
</tbody>
</table>
### Table 4. An Overview of the Use of Design Thinking in the Six Case Companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Year started + main influence</th>
<th>Main Use of DT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser Permanente</td>
<td>2003 IDEO</td>
<td>DT is deployed as a process in large-scale innovation projects related to health care delivery, but is also used outside of these projects, for example to facilitate change processes within the organization. Frontline staff that have participated in projects often use the techniques learned in direct contact with patients in order to improve their work practices.</td>
</tr>
<tr>
<td>Corporate Soft. Co.</td>
<td>2005 IDEO, Stanford d.school</td>
<td>Especially in training and facilitation, understood as a process, based on the d.school DT process. Teams who utilize parts of DT (e.g., brainstorming, prototyping on a daily basis) have often developed their own new ways of working by incorporating DT elements.</td>
</tr>
<tr>
<td>P&amp;G (products)</td>
<td>2006 R. Martin, T. Brown</td>
<td>DT as a set of principles on an organizational level. Diverse practices in different parts of the company. Facilitated workshops vary in terms of the process but use a shared set of techniques aiming at training DT and supporting development teams in idea development, team achievement and learning. Teams who use DT in their daily work have developed their own routines utilizing elements of DT.</td>
</tr>
<tr>
<td>Intuit (software)</td>
<td>2006 Networking with peers</td>
<td>On an organizational level, DT is established as a set of principles to which every employee should adhere. Facilitated workshops are held to teach DT and to support development teams. Teams who use DT in their daily work have developed their own ways of working by utilizing elements of DT and a set of internally developed techniques in line with the principles.</td>
</tr>
<tr>
<td>Panasonic (products)</td>
<td>2006 Stanford University</td>
<td>DT as elements are utilized within a newly developed product innovation process for long-term innovation projects. Focus on iterative, low-resolution prototyping and early user involvement.</td>
</tr>
<tr>
<td>Deutsche Bank</td>
<td>2008 University of St. Gallen</td>
<td>DT is perceived as an innovation process that uses a variety of techniques to develop and test innovative solutions by means of prototypes.</td>
</tr>
</tbody>
</table>
SCRUM. It is also considered essential for developing a shared culture within the firm that encourages employees to use DT on a day-to-day basis.

**Procter & Gamble (P&G)** is a global consumer goods company with 120,000 employees. The original intent was to use design differently to increase the company’s ability to create better-designed products, but the role of design developed into a more general approach to innovation, later called DT. This development started in 2006 through an initiative of the CEO supported by faculty from Stanford University’s d.school, Roger Martin from the Rotman School of Management, Patrick Whitney from the Illinois Institute of Technology, and Tim Brown from IDEO. DT is not seen as a prescriptive process, rather the emphasis is on a number of principles: empathy, ‘from defining to framing’, ‘from validation to learning through prototyping’, ‘from ideas to stories’ and ‘from knowing to collective curiosity’. Processes as well as the application of techniques are seen as project dependent. These are enacted in various business units through various practices. There is a focus on storytelling and displayed thinking or the use of sketching and prototyping during conversations. Within the company DT is utilized in three ways. First, as an element in a human-centred approach, which supports teams over many months to improve their innovation capabilities. Second, as a facilitated workshop format aimed at supporting teams in idea generation, team alignment and learning, supported by a volunteer network of facilitators. Third, as in some divisions where continuous prototyping and testing have been integrated into everyday practice. All three approaches have been applied in numerous areas including strategy, business models, products, services, processes and organizational structure. The company’s objective is to make DT daily practice among employees.

**Intuit** is a Silicon Valley-based software firm targeting small businesses and private users. On its founder’s initiative, the company engaged with DT in 2006 to increase its innovativeness by focusing on user needs. Intuit learnt about DT and its implementation through networking with other companies using DT, and through contacts with Roger Martin and IDEO. No external consultants were involved in the implementation; instead, the company used its internal resources and tried to adapt DT to fit the company context and needs. Instead of creating a specific process, the goal was to make its 8,000 employees embrace three principles that were established at the organizational level, and apply them in their daily work. First, ‘deep user empathy’ was intended to make employees focus on developing a deep user understanding. Second, ‘going broad to narrow’ would encourage staff to engage in a creative process to develop a variety of solutions before narrowing down to the preferred solution. Finally, ‘rapid experiments with users’ was designed to test ideas with the user throughout the development process while gathering behavioural data. The company believes there is no prescribed way of working with DT, and employees are free to apply these principles according to their beliefs. It seems that more and more teams are applying DT on an everyday basis in their innovation work. Within the company, DT has been applied to finance, strategy and marketing, and used to develop internal social networks and informal structures for innovation. All DT principles are linked to a series of techniques, some of which are common in DT discourse, others of which have been developed by the company. Widespread awareness of these principles is achieved by holding workshops and advertising cases of success internally.

**Panasonic** is a multinational electronics corporation with more than 300,000 employees. In 2006, the company set up a new corporate R&D lab in Silicon Valley. Inspired by an early collaboration with Stanford University and its Mechanical Engineering 310 (ME310) course, it was believed that including rapid experimentation through prototyping and iteration, and a user-focus based on observations, would complement the existing development process. As a result, elements of DT were integrated into the concept development process. Panasonic describe DT as a multi-step, iterative process towards product innovation, which is executed by multidisciplinary teams. The main emphasis is on user-involvement – sometimes including external partners such as suppliers – as an input to concept development and prototype evaluation. The use of low-resolution prototypes in combination with an open environment that allows for failure and iterations is also considered important. The company headquarters supports the work of its lab and has encouraged it to formalize its DT-based approach in order to disseminate it to other R&D locations.

**Deutsche Bank** is a global banking and financial services company with some 98,000 employees which has its headquarters in Germany. DT was introduced into the Group Technology and Operations division, which supports the retail banking business, to experiment with an alternative way of innovating in an otherwise operationally focused organization. It was also seen as a way of signalling the company’s innovativeness in order to attract young graduates and new talent. The approach was developed through close collaboration with facilitators from the
University of St. Gallen, following a predefined process inspired by Stanford University’s ME310 course which is perceived as closely connected to the Stanford d.school. The process starts with ‘on-boarding’ to familiarize team members with each other and the company. An exploration phase ‘d.Space’ follows where various methods and tools are used to generate insights (e.g., progression curves, back-casting, fore-casting, user research), including an unloading phase to discard old ideas. Based on initial research, the team develops a series of ideas that are developed into prototypes. Testing and refining these prototypes result in an iterative process that allows for verification of initial assumptions and ideas. Results are presented in internal open presentations, and implementation is left to the project sponsor. DT has been utilized since 2008 in special innovation projects (2–3 per year). The projects have been performed by multidisciplinary teams of students and facilitated by method coaches from the University of St. Gallen. Depending on the internal sponsor, projects can involve many areas of the financial institution (e.g., human resources, bank-of-the-future).

**Design Thinking in Practice: Five Themes Characterizing the Concept**

To summarize, the six companies have implemented DT in various ways (Table 4). This diversity of use applies mainly between firms but in some cases also within a firm, between business areas or even between projects. In one company all large innovation projects were structured according to an explicit, cascade-like process inspired by DT. In another, there was a desire to step away from DT as an innovation process, and instead, to frame a set of principles that allowed for more flexible use of DT across different functions at both the project and individual levels. In another company, DT was neither integrated into development nor at an organizational level but was used in a series of side projects. Several interviewees thought of DT as a structured approach to innovation or problem solving. Although they often sought to distance themselves from common descriptions of DT that they felt were too ‘process-like’, many of their descriptions of DT included a number of broad subsequent steps. It was often pointed out that these steps or phases could be executed in varying order. Despite the large variety in use and application, five common themes characterizing the use of DT emerged from our study. These themes are described below, and later discussed in the light of previous literature.

**User Focus**

The first theme refers to an inherent user focus, expressed in terms of empathy building, deep user understanding and user involvement. Interviewees described how the development of all offers and solutions was made with the user in mind, and that every activity is geared towards finding solutions to user needs. In some companies, this strong focus on the user was considered the norm, and was often one of the reasons for engaging with DT in the first place. In other companies, shifting from being technology driven to user driven had proved more difficult. In general, even in companies with an explicit ambition to be user-focused, the DT approach was perceived as fundamentally shifting their mindset about how to relate to user knowledge. In their view, a crucial part of DT entails gaining a thorough understanding of users and their needs, even those they are unaware of. The practices employed to arrive at this understanding are generally carried out through extensive qualitative research, as described by an interviewee: ‘We like to go as far as we can to really understand the customer […] what really motivates them and what their purposes are and what they do’. The ethnographic approach to user research often required the use of new techniques such as observation in combination with qualitative interviews. Some companies chose to focus on techniques that were perceived as more straightforward; for instance, journey mapping and empathy maps were step-by-step techniques that were considered easy to grasp.

Empathy was stressed as important and, in order to empathize, different principles/mindsets were seen as crucial: being open, avoiding being judgmental and being comfortable around people with different backgrounds and opinions. Several techniques used to develop an empathic mindset were highlighted. For instance, one interviewee told us how the company encouraged its employees to informally engage users in different settings:

> Simple things like ‘why don’t you go and have a cup of coffee with the customer first’, and get to know them as a person first, then as a customer who has a problem. [...] The beauty of that is when they come back, it’s... there’s something inherent about ‘oh Judy had this problem’ [...] and then they get to take the leap to what’s implicit in what Judy might need or have or want.

Central to the user focus was the active involvement of users in idea generation, prototyping and validation of ideas. Users were involved in rapid prototyping to get direct
input, and one interviewee said that direct feedback on ideas had been an eye-opener for project members:

We made them go back to the customers and get feedback on their ideas, I mean, it was transformative, these leaders were like ‘Oh my God, first of all, it’s been forever since I talked to a customer, I can’t believe these are their problems, and you know, I thought I came up with great ideas but they were actually terrible’.

**Problem Framing**

The second theme refers to how interviewees related to the problem at hand: instead of trying to solve the problem, they tried to widen, challenge and reframe it. Many described how they repeatedly questioned and reformulated the initial problem, and how identifying a larger problem space helps create a larger solution space. Several interviewees from one of the companies stressed the importance of creating many alternatives as opposed to narrowing down the choice too quickly to a single solution:

We tend to narrow down the choice very fast, and then to converge toward a kind of solution, [now, with DT] we open up much more in the beginning in terms of the number of choices and the number of insights, that maybe we didn’t think about.

Although problem framing was depicted as characteristic of DT, it was often perceived as counter-intuitive: ‘It’s difficult for people to achieve because we’re trained to think in solutions. Even at home, if somebody approaches us and asks us, look I have this and this problem, all of us come up with the great idea of how he should do this’. Here, several mindsets were proposed as critical: unconstrained and futuristic thinking, and openness to the unexpected, as one interviewee put it: ‘... no constraints, no limits, take the corporate hat off and just free flowing of ideas and thoughts’. They also mentioned that the approach requires people to feel comfortable with complex problems and to accept ambiguity, something that was described as difficult in some cases: ‘I would say companies aren’t as comfortable with the idea of ambiguity. And it’s certainly at a few points during the session you struggle with a little ambiguity and tension’.

In some companies, problem framing was addressed explicitly through the use of techniques such as ‘how-might-we questions’, ‘painstorming’ (brainstorming on problems users might experience) and other internally developed techniques.

**Visualization**

The third theme refers to visual representations: making ideas tangible by means of low-resolution representations or mock-ups of ideas or solutions. These representations could be physical in two or three dimensions, or enacted through role-play and storytelling. Typical techniques include sketching, improvisation or making simple models by gluing or taping paper, foam, wood, etc. In software development, writing ‘ugly code’ was mentioned as a way of prototyping, as well as creating still images displayed on smartphones as a way of visualizing a new application. Further, storyboarding, acting, role-playing and video-skits were used across companies to prototype new ideas and insights.

Interviewees stressed that prototyping was not only about testing and refining ideas, but was also a way to create consensus and share insights:

There are a lot of things you can learn from quick prototyping [...] You don’t need to completely design the product to death to really know, to start to learn things, and that you will learn even things you didn’t think you could learn about user experience, very simple prototypes ... It fosters creativity; it gives people something to talk about.

Various visualization techniques were useful for making sense of data, selecting ideas and converging on solutions – tasks that many perceived as difficult. Overall different ways of making ideas tangible were seen as helpful for externalizing and communicating ideas in order to test and clarify them.

**Experimentation**

The fourth theme refers to experimentation and iteration: a bias towards testing and trying things out in an iterative way, and moving between divergent and convergent ways of thinking. The importance of working on multiple solutions was described by one interviewee as:

A lot of times our brains want to lock in to our favourite solution immediately or our favourite narrowed concept before we have had a chance to go broad and really give better ideas a chance to live. So we specifically work on the broad to narrow [...] and even do that iteratively, say we are building an offering, we may want to step back mid-process and say look, we are actually down to something that is not working or that we are overly focused and should we think broadly again.
Interviewees also described how ideas and solutions are tested as soon as possible to obtain user feedback.

The idea to ‘fail often and fail soon’, which values mistakes rather than considering them a waste of time, was mentioned repeatedly. Several principles/mindsets were viewed as supporting the different practices linked to experimentation: curiosity, playfulness, optimism and displaying a sense of humour. One interviewee expanded on how mindsets had become a critical dimension of project team creation:

I wanted it to be people that were kind of innately curious and people that had kind of a sense of humour about themselves, because we will probably be making a lot of mistakes. So ‘are they people who can kind of roll with it and laugh at themselves and be OK with it?’.

Further, creativity, and unconstrained thinking were seen as important, as a mindset geared towards action:

[We need to] push our employees to rapidly experiment, ‘don’t sit there with this thing that you think is right, go find out if it’s right, and don’t wait until it’s perfect before you go and find out’.

The common denominator in practices linked to ‘Experiment’ seems to be a focus on learning.

Diversity

The fifth theme refers to diversity, encompassing collaboration in diverse teams, and the integration of diverse outside perspectives throughout the process.

The importance of team diversity was a central theme running through the interviews. For instance, one interviewee described the mix of competences that was ideal for a team:

I want people that are new, that are coming out of college, that bring fresh ideas from college or people that had a couple of years of experience [...] in many industries, so that you can bring in that breadth [...] I wanted people that have the kind of the front end from a design research, expertise in that area [...] and I want people that are really great builders of things, prototypes of things.

Several stressed that not everyone has to be a builder of things, prototypes of things. In at least two companies, conscious recruitment and even personality tests were used to ensure a wide range of skills. A consequence of the importance placed on the diversity of teams was a democratic spirit, and openness to differences in backgrounds which were seen as essential. In some instances diversity referred not only to skills but also to hierarchy.

Diversity of perspectives and inspiration from various different fields were described as important: ‘[It is] a philosophy of looking across the border so to look into other industries, how do they solve things that are similar’. Analogies with and study visits to different industries were useful techniques. Networking with other organizations such as universities, design firms and other companies was also seen as a way of expanding horizons. While most of the companies described user research and analogies as their major sources of inspiration, one of the interviewees emphasized conducting thorough and broad background research. This should include past, current and future trends, and focus on a wide range of stakeholders, competitors and parallel fields. Business, technology and design viability are also considered important; ‘360° research’ was mentioned as a technique, including white space analysis, study of secondary documentation, internet and newspaper articles, pattern recognition, demographics and various types of data from previous work.

Towards an Alternative Framing of Design Thinking

It is notable that the concept varies across contexts, with emphasis on, for example, iteration in one setting, and deep user understanding in another.

The Need for a Different Way of Describing Design Thinking

Each organization’s understanding of a concept depends on a variety of factors, such as their needs, their sources of knowledge about the concept, and their organizational context, which allows and suppresses various aspects of use. According to Sevón (1996, p. 51), a concept that is picked up in the organization and ‘materialized into action’ will change continuously through its use and in the borrowing of ideas or practices from various actors. Nevertheless, a common problem related to previous representations is that they are normative and essentialist in nature, and do not take account of what the concept of DT becomes when it is used by and adapted to different practices in different
ontologies. The essentialist view of models that is common in the current management literature has been criticized in general terms (e.g., Engwall, Kling, & Werr, 2005) as have attempts to define what is DT (Johansson-Sköldberg et al., 2013). There is a need for a description of DT that is less normative and static and that is specific enough to be able to frame it as a concept, yet flexible enough to allow for variety in its local use. There is also a need for a description that takes account of the various facets of use, so that DT can be seen as a process, or as methods, a toolbox, a mental approach, a culture or a mix thereof. This would mean that researchers studying DT would not have to rely on, for example, the d.school process, which is one of the more common descriptions but which does not capture what goes on in the name of DT in many organizations.

Ontological Underpinnings

Building on Latour’s (1986) distinction between the ostensive and performative aspects of power (power exists both in principle and practice), Feldman and Pentland (2003) challenged the traditional understanding of organizational routines as static. According to them,

The ostensive aspect is the ideal or schematic form of a routine […] the abstract, generalized idea of the routine, or the routine in principle. The performative aspect of the routine consists of specific actions, by specific people, in specific places and times. It is the routine in practice. Both of these aspects are necessary for an organizational routine to exist (Feldman & Pentland, 2003, p. 101).

Feldman and Pentland (2003) claim that this ontology allows for a better explanation of the empirical findings and of the actions of individuals in organizations. Along the same lines, Sevón (1996) argues that a management concept can be seen as consisting of both an ostensive and a performative part. Drawing on these two perspectives allows DT to be discussed as something that ‘is’, as well as multiple versions of what it ‘becomes’ in use. Thus, both the idea and the enactment of the idea are necessary to constitute what we understand as DT.

Proposing an Analytical Framework of Design Thinking

Based on this ontology, this paper proposes a framework to describe DT that provides a structure to discuss it. The analysis of its use in the six companies revealed five main characteristic themes that were present across contexts, despite the variety of industrial settings and areas of application: User focus, Problem framing, Visualization, Experimentation and Diversity. Table 5 shows the basic structure of the framework in which the five themes (on one axis) are connected to various themes/mindsets, practices and techniques (on the other axis).

In the various organizations the principles were more or less pronounced, and enacted in a variety of ways. Our analysis shows also that there is an abundance of techniques used to support these practices. Examples of principles/mindsets, practices and techniques are presented in Table 5. The proposed framework is seen as one way of framing the idea of DT. Thus, it supports analysis of DT, allowing for the inclusion of variations in the way that DT is translated in the different organizations.

While the characteristic themes are presented as separate in our simplified framework, there is a certain overlap as some of the statements made by our interviewees were linked to several themes, explaining that there is some overlap between the themes. For example, when interviewees refer to rapid experimentation with users, this included User Focus, Visualization and Experimentation. Similarly, many of the principles/mindsets identified can be linked to several practices. For example, an empathetic mindset is useful to develop an understanding of the user and to facilitate working in diverse teams. Accordingly, some of the techniques support several practices and principles/mindsets (e.g., brainstorming techniques were found useful both for exploring a problem statement and for generating ideas once the problem statement was defined). There is also a natural interplay between the various elements: a principle/mindset is developed by the experience of use, and vice versa. One interviewee stated that: ‘these are a series of methods and techniques that if you do them often enough, they become part of your mindset. So I really get people to do them first, rather than change their mind of what it is’. Such reinforcing power would naturally work in both directions, so mindsets may also influence the way things are done and which techniques are selected.

Discussion

This paper has developed a framework structure for DT as well as identified five themes.
Table 5. Characteristics of Design Thinking Put Forward by Interviewees, Structured According to the Proposed Framework

<table>
<thead>
<tr>
<th>Themes</th>
<th>Principles/Mindsets</th>
<th>Practices</th>
<th>Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User focus</strong></td>
<td>• Empathic</td>
<td>• Seek to understand latent needs and pain points of users (empathize) and let this understanding guide all work</td>
<td>• Ethnographic research</td>
</tr>
<tr>
<td></td>
<td>• Curious</td>
<td>• Use a qualitative, context specific approach in user research.</td>
<td>• Informal meetings with customers</td>
</tr>
<tr>
<td></td>
<td>• Non-judgemental</td>
<td>• Involve users in ideation, prototyping, testing</td>
<td>• Accumulate user stories and anecdotes</td>
</tr>
<tr>
<td></td>
<td>• Social</td>
<td></td>
<td>• Journey mapping, empathy map, persona</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• User feedback sessions</td>
</tr>
<tr>
<td><strong>Problem framing</strong></td>
<td>• Unconstrained thinking</td>
<td>• Challenge and reframe the initial problem to expand both problem and solution space</td>
<td>• ‘How-might-we-questions’</td>
</tr>
<tr>
<td></td>
<td>• Comfortable with complexity and ambiguity</td>
<td>• Synthesis of research insights: finding patterns, framestorming (ideation to find alternative problem formulations)</td>
<td>• ‘Five why’</td>
</tr>
<tr>
<td></td>
<td>• Open to the unexpected</td>
<td></td>
<td>• ‘The problem statement’ (Point Of View), ‘painstorm’, ‘FOG’ (fact, opinion, guess)</td>
</tr>
<tr>
<td><strong>Visualization</strong></td>
<td>• Thinking through doing</td>
<td>• Make ideas and insights visual and tangible to externalize knowledge, communicate and create new ideas</td>
<td>• Creation of rough physical mock-ups by using e.g. paper, cardboard, glue and foam, Lego, or any available artefacts</td>
</tr>
<tr>
<td></td>
<td>• Bias towards action</td>
<td>• Visually structure data</td>
<td>• Sketching, storyboarding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Make rough representations</td>
<td>• Storytelling, role-play, video</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide experiences to enable understanding</td>
<td>• Writing ‘ugly code’, wireframes</td>
</tr>
<tr>
<td><strong>Experimentation</strong></td>
<td>• Curious and creative</td>
<td>• Work iteratively (divergent, convergent)</td>
<td>• Brainstorming techniques</td>
</tr>
<tr>
<td></td>
<td>• Playful and humoristic</td>
<td>• Converge based on a diverse set of ideas</td>
<td>• Creation of flexible and physical space that supports experimentation and visualization</td>
</tr>
<tr>
<td></td>
<td>• Optimistic and energetic</td>
<td>• Prototype quickly and often to learn</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Learning-oriented</td>
<td>• Test solutions quickly and often: share prototypes with users and colleagues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Eager to share</td>
<td>• Fail often and fail soon</td>
<td></td>
</tr>
<tr>
<td><strong>Diversity</strong></td>
<td>• Integrative thinking</td>
<td>• Create diverse teams and let everyone’s opinion count</td>
<td>• Personality tests</td>
</tr>
<tr>
<td></td>
<td>• Open to differences in personality type/background</td>
<td>• Collaborate with external entities</td>
<td>• Conscious recruitment</td>
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<tr>
<td></td>
<td>• Democratic spirit</td>
<td>• Seek diverse perspectives and inspirations (variety of fields, broad research)</td>
<td>• Analogies, study visits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Take a holistic perspective into account</td>
<td>• ‘360° research’: white space analysis, benchmarking, past failure and success, pattern recognition, demographics, etc.</td>
</tr>
</tbody>
</table>
characterizing DT. In this section, these themes will first be discussed, followed by a discussion of the framework per se.

The Characteristic Themes of Design Thinking

In discussing the intellectual roots of DT in design theory, Liedtka (2015) identified a number of characteristics present in current DT discourse: the focus on wicked problems (Rittel & Webber, 1973), problem exploration (Rittel & Webber, 1973; Schön, 1983; Dorst & Cross, 2001) learning focus and a hypothesis-driven approach (Schön, 1983), and a focus on what might be (Schön, 1983). This corresponds to the themes Problem framing and Experimentation identified by our analysis.

For example, Dorst (2006, p. 67) sees framing as ‘the creation of a novel standpoint from which a problematic situation can be tackled’, building on Schön (1983) who argued that creating a framework is a core practice common to all design disciplines. Also, Cross (2011, p. ii) emphasizes the mental process of designing, and argues that this represents ‘the core of the creative process for any designer’. The reflective reframing of problems is also present in the recent DT literature (e.g., Boland & Collopy, 2004; Drews, 2009; Lockwood, 2010).

Being comfortable with ambiguity has been stressed as a characteristic of individuals engaged in DT (e.g., Boland & Collopy, 2004; Cooper & Junginger, 2009; Drews, 2009; Lockwood, 2010), along with enjoyment from problem solving and exploration of constraints in ways that can result in unexpected directions (e.g., Fraser, 2007; Brown, 2008; Gloppen, 2009).

In design theory a learning-focused and hypothesis-driven approach, such as proposed by Schön (1983), is central. The idea here is that while scientific hypothesis work focuses on what already exists, design hypothesis work is about what might be. The DT literature stresses the logic of ‘what could be’ and being future-oriented (e.g., Fraser, 2009; Martin, 2009; Lockwood, 2010). Martin (2009) refers to the ability of professional designers to switch among abductive, inductive and deductive ways of reasoning. Practices such as early and fast prototyping, the combination of divergent and convergent approaches, and rapid iterative development cycles are proposed by several researchers (e.g., Boland & Collopy, 2004; Brown, 2009; Rylander, 2009; Lockwood, 2010). Attitudes mentioned include inclination to explore, risking failure and failing fast (e.g., Fraser, 2007; Brown, 2008; Holloway, 2009). Overall, this resonates with our results, although our interviewees tended to focus on what they do rather than how they reason.

Liedtka (2015) notes also that there are some elements critical to DT that are not prominent in earlier design research: the issue of empathy (the core value of human-centeredness); the role of visualization and prototyping (in order to learn, not just display); and the issue of who designs (the designer, architect or engineer vs. ‘anyone’ who can take inspiration from designers’ thinking and working, and co-creation with users); these elements correspond well to the remaining themes we identified: User focus, Visualization and Diversity.

Although user focus and, more specifically, empathy have been argued to be less emphasized in design theory, they are core to newer design approaches such as user-centred (Norman, 2002) and user experience (e.g., Buxton, 2007) design, and disciplines such as user interface (e.g., Norman, Miller, & Henderson, 1995) and service design (e.g., Goldstein, Johnston, Duffy, & Rao, 2002). In line with these newer developments, Brown (2008, p. 87) describes a design thinker as someone who has empathy – and can ‘imagine the world from multiple perspectives’ – those of colleagues, clients, end users and customers. He argues that ‘great design thinkers observe the world in minute detail. They notice things that others do not and use their insights to inspire innovation’.

The repeated use of the term ‘empathy’ by our interviewees reflects the proximity to popular discourse around DT. Several interviewees stressed observation in combination with qualitative interviews; approaches that are also advocated by DT proponents (e.g., Brown, 2008; Holloway, 2009; Ward, Runcie, & Morris, 2009). User involvement throughout the design process is also a recurring theme in the DT literature (e.g., Brown, 2008, 2009). Practices such as iterating concepts and unfinished prototypes with users in short loops are described, as is involving users actively in an empathy-building phase (Brown, 2008; McCreary, 2010; Stanford d. school, 2010; Liedtka & Ogilvie, 2011; Lin, Hughes, Katica, Dining-Zuber, & Plsek, 2011).

In the DT-related literature the idea of visual thinking and making tangible representations as part of iterations and learning is discussed (e.g., Boland & Collopy, 2004; Drews, 2009; Ward et al., 2009; Carr et al., 2010; Lockwood, 2010). Common visualization practices, especially in relation to prototyping, are described in the DT literature and include techniques such as sketching, building models, acting, role-play, storytelling
personas, metaphors and analogies (e.g., Drews, 2009; Ward et al., 2009; Stanford d.school, 2010; Liedtka & Ogilvie, 2011). Using the walls of a project room, or a ‘creative space’ to make sense of large amounts of data is described as common practice (Doorley & Witthoft, 2011). These are practices that were present in all the investigated companies, and perceived as something very new compared to earlier ways of working. Interestingly, despite this focus on visualization, both Tonkinwise (2011) and Jahnke (2013) criticize the DT discourse for its lack of focus on aesthetic knowledge, thereby questioning the potential contribution that DT could have to innovation. Since both Tonkinwise and Jahnke refer to similar practices, this criticism points to an interesting conflict. More specifically, it poses the question of whether only trained designers have the ability to reflect and learn by making ideas tangible and evolving concepts.

The issue of who designs is a topic reflected in our final theme, Diversity. Proponents linked to IDEO (Kelley & Littman, 2001; Brown, 2008, 2009; Kelley & Kelley, 2013) often put focus on the individuals engaged in practising DT, and argue for mixed teams where a range of individuals from different disciplines collaborate. A collaborative work style involving many stakeholders and interdisciplinary teams is also stressed by, for example, Dunne and Martin (2006) and Sato, Lucente, Meyer, and Mrazek (2010). This aspect of DT has also been picked up by scholars, for example Seidel and Fixson (2013) in their work on DT in multidisciplinary teams. As noted by Liedtka (2015), aspects of collaboration are absent from classic design research, which is focused mainly on studies of the individual professionally trained designer or architect. By democratizing and codifying design, and portraying it as a general discipline, DT thus challenges the role of the professional designer, focusing renewed attention on the question of expert design (Lawson & Dorst, 2013). Further, the trend towards general design education at universities and in industry raises questions regarding the practices and content of a general design education.

We observe that the five themes identified by our study have good correspondence with both design theory and how DT is portrayed in current discourse. A majority of the case companies implemented DT in collaboration with, or influenced by some of the core promoters of DT (IDEO, Roger Martin, Stanford d.school), which is reflected in many shared practices and similar ways of thinking in relation to DT. A few topics supported by DT proponents did not have the same weight in our interviews: for example, the focus on ideation and defining (Stanford d.school, 2010), and the idea of finding the right balance between desirability, feasibility and viability. Regarding ideation and defining, we should mention that individuals referred to how they took ideas forward or made sense of the data they collected. However, they did not recognize these activities as distinct phases, or did not put particular emphasis on these in describing their use of DT. Regarding the balance between desirability, feasibility and viability, it is interesting that while many authors (although not Liedtka & Ogilvie, 2011) referred to them as benefits of DT, there was reference to very few tools for how to work with feasibility and viability (e.g., Brown, 2008; Stanford d.school, 2010). This could be because the roots of this discourse lie in consulting and education, which are less influenced by feasibility and viability constraints. Also, the lack of principles/mindsets, practices and techniques addressing these aspects might be linked to challenges regarding the uptake and further advancement of ideas developed using DT in companies (Carlgren et al., 2014).

A Framing of Design Thinking as Idea and Enactment

This paper set out to propose a way of framing DT by investigating its use in practice in organizations claiming to use DT. We argue that a starting point for a different type of discussion around DT is an acknowledgement that both the ostensive and performative aspects of DT need to be taken into account: DT as an idea and the enactment of DT. Interviews with members of the six companies constituting our sample revealed that DT is perceived to be used and applied in a variety of ways in different contexts; a richness that earlier representations fail to depict. In order to create a framing for DT that is sufficiently flexible to embrace the many ways it is put into practice, rather than building on the literature we needed to investigate how it was used in practice in companies.

It can be argued that conceptualizing DT as five themes is merely to add another categorization of DT. However, the proposed framework contributes by providing a structure for a discussion of DT that encompasses various understandings of DT. As such, the framework allows for more specific discussion of how DT affects, and potentially creates, value in large organizations, which responds to the call for a more sustained development of the concept (Johansson-Sköldberg et al., 2013).

Our investigation shows that the way DT is perceived and used in the case companies is similar in many ways to how the concept
is portrayed in the literature, and by its main proponents, which could be expected given that many of the early adopters of DT were influenced (directly or indirectly) by, for example, IDEO, Roger Martin and the d.school. Several of the firms in this study include early adopters of DT. However, we showed that over the course of a few years, the concept has been translated (Czarniawska & Sevón, 1996) by these companies in making sense of it in their particular contexts. Therefore, there is a need to frame DT such that it makes sense to practitioners who may interpret and adapt it in different ways. For researchers investigating DT in organizations, a framing of DT that accommodates its many ways (Lindberg et al., 2011; Carlgren et al., 2014) is crucial for research design and the communication of results.

It could be argued that framing DT in a way that allows for a large variety of interpretations, leads to a dilution of the concept, until it finally loses its sense. For instance, many of the practices linked to DT are included in the notions of lean start-up and customer-centred development. As discussed in the literature (Johansson-Sköldberg et al., 2013; Liedtka, 2015), the key to understanding DT might lie in the interplay among its elements, rather than in a single element in isolation. In this context, the proposed framework allows for an alternative framing of the whole, that allows consideration of multiple dimensions throughout the process. It allows for identification of design-related themes such as user focus, not just in specific phases, such as ‘empathize’ and ‘test’ (Stanford d.school, 2010).

The idea of mindset as a way of individual embodiment of principles is central to DT. The focus on specific ways of thinking, attitudes and cognition emphasize the importance of individuals and the ways they interact. Other concepts, such as Lean and TQM, also involve mindset changes but in the context of DT the interviewees emphasized the development of a different mindset from the outset. This will affect how DT is addressed in organizations, what actions might be planned, and how DT might be evaluated.

Implications

Implications for Academia and Future Research

Our research addresses a previously identified gap in the research (Carr et al., 2010; Johansson-Sköldberg et al., 2013) by increasing our empirical understanding of how DT is practised in organizations. In providing a structure and a language for discussing DT, the proposed framework presents opportunities to connect DT in practice with previous research in order to examine how DT relates to design more broadly, and to ‘designerly thinking’ in particular. If DT is compared to design in general, what aspects are missing or overlapping? The findings from the analysis in this paper and the framework proposed facilitate comparison with current management research on design and innovation, and identification of gaps and overlaps between the fields. The framework could be used to outline and design further empirical research, and for theoretical studies of DT in relation to other academic discourses. The proposal of five characteristic themes opens the way to discussion of how to view the boundaries to the concept of DT. For example, is an empathic mindset or the use of one specific design method in a corporate setting ‘enough’ to justify it being described as DT, or is it necessary for all five themes suggested in this paper to be present? Building on research into various management concepts and ideas would allow comparison with other managerial concepts, and further exploration of DT diffusion, translation and adaptation to management concepts.

It has been suggested that DT might provide a way to challenge existing cognitive biases (Liedtka, 2015). However, given the emphasis on a change in mindset – which can be regarded as cognitive bias – it could be argued that DT leads to new cognitive biases. Thus, the existence of cognitive bias or mindsets might be seen as signalling DT expertise, rather than a limitation. Future research could explore cognitive bias as expertise, and DT’s influence in fostering design-related cognitive bias.

Managerial Implications

In the rhetoric promoting the idea of DT to practitioners, there is a frequent, unspoken, assumption that DT in practice is always the same thing. This is exemplified by generic process descriptions of ideation and concept development (Plattner, Meinel, & Weinberg, 2009; Stanford d.school, 2009, 2010). However, when the interviewees described what they do when they use DT, it is clear that some companies put more emphasis on actions and specific techniques/methods, while others talk more about the principles or mindsets guiding their employees. This insight might allow managers to make more informed decisions with regard to implementation, planning and evaluation. Our framework could provide a language to describe DT, and could reduce the ambiguity that accompanies loosely defined concepts while leaving room for interpretation. The framework describes central themes in DT but also provides a structure to identify those
principles/mindsets, practices and techniques that might be useful to the companies. This would help managers planning DT initiatives, and reflecting on the adaptation and use of DT. In previous research on management concepts, fads and innovations such as Lean and TQM, it has been argued that forgetting the ‘soft factors’ can be detrimental to the implementation and success of a management concept (Hoogervorst, Koopman, & van der Flier, 2005; Jeyaraman & Teo, 2010). Our proposed framework should encourage managers to include this perspective from the beginning. Further research into managerial concepts could extend our analysis by looking into the rhetorical dimensions of DT (e.g., Kieser, 1997).

Quality of Research

Our study has some important limitations. First, some might question whether our study design allows us to study the phenomenon of interest: we may be studying companies with such different perceptions of DT that it is like comparing apples and oranges. However, in identifying our cases as companies that publicly state that they use the concept of DT, we hope we have addressed this potential weakness. To ensure that our companies were experienced in DT practice, we chose firms declaring they had used DT for at least four years. Also, to allow observations within and between industries, we identified pairs of companies from three different industries (production, service, software). We found no significant differences across industries, but many commonalities.

The proposed framework builds on the accounts of individuals from the six companies, and thus represents individual perspectives and perceptions. To increase the reliability of our results, we interviewed a minimum of five individuals from each company, selected to represent various functions and perspectives. However, since many interviewees were involved in the implementation of DT and can be described as ambassadors of the approach, there is a risk of positive bias. We took account of this in our analysis to limit biased interpretation of the data. It has been argued that in exploratory research, combining methods allows for more depth, for example combining ethnographic observation with qualitative interviews (e.g., Edmondson & McManus, 2007; Bryman & Bell, 2007). A next step would be to complement this study with ethnographic observations to refine and, if necessary, revise parts of the framework.

To increase the trustworthiness of the study (Guba & Lincoln, 1994), we documented each step in the research carefully to make the relations between data, coding and categories transparent. Finally, we solicited feedback from our interviewees and there were no objections raised in relation to our findings. One company has already used the framework to improve its strategy of integrating and communicating its DT-based approach internally. For transparency, the paper also includes a description of the use of DT within each company, as well as at an aggregate level. The three members of the research team who ran this study also come from a variety of backgrounds, including both engineering and design. We have tried to exploit our different perspectives and relations to design as assets in our discussions and interpretations of the data.

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Note

1. Refers to the managerial concept of DT, not to be confused with previous design thinking research described in design theory literature (see Johansson-Sköldberg et al., 2013).

References


