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EXPLORING THE USE OF DESIGN THINKING IN LARGE ORGANIZATIONS: Towards a research agenda

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ABSTRACT

In managerial debates, design thinking (DT) is promoted as a user-centered approach to innovation, suggesting that any firm could learn from the practice of designers. Still, it is unclear how DT relates to design in general, and to the design profession in specific. Previous work on DT is mainly theoretical, and empirical investigations of how DT is used in organizations are needed in order to better understand the concept in relation to existing theories. This paper reports the findings from an exploratory study of the use of DT in large organizations from four industries: software, product, service and healthcare. Based on qualitative interviews with key informants in 16 firms, a wide spread in terms of how DT was perceived and used in a variety of organizational settings is described. This puts focus on the use of DT as well as the importance of the local context. The paper contributes to an increased empirical understanding of DT, and proposes a research agenda.

INTRODUCTION

In search for alternative approaches to innovation, there is an increasing interest in design, both among scholars and practitioners (e.g. Borja de Mozota, 2010; Mutanen, 2008; Perks & Cooper, 2005; Veryzer & Mozota, 2005). Recently, the notion of design thinking (DT) has emerged in management literature, describing how any firm could benefit from designer's practice (e.g. Dunne & Martin, 2006; Brown, 2008; Brown, 2009; Martin, 2011). An important aspect of the concept is that it suggests that anyone can learn to apply a design approach to any innovation challenge (Martin, 2009; Brown and Katz, 2011).

The concept of DT has a growing, yet ambiguous importance. For example, how does DT relate to design in a broader sense, and to the accomplishments in design research? Is DT a new way to design, or a new way to organize any activity, which is not necessarily design? From a design research perspective, the term DT itself is a source of misunderstanding, mainly due to the use of the term in studies of professional designers and architects (e.g. Cross, 2011; Krippendorff, 2006; Rowe, 1991; Schön, 1983) denoted 'design thinking'. As noted by Johansson-Sköldberg et al. (2013), in the more recent managerial debate there are few, if any, references made to this work, and it has been suggested that this lack of a theoretical foundation of 'managerial DT' has led to some reluctance among scholars to perform research on the subject (Jahnke, 2013; Johansson-Sköldberg et al., 2013; Kimbell, 2011).

As DT is gaining foothold among practitioners, several

large firms such as Procter & Gamble, SAP, GE Healthcare, Philips have accentuated the value created by this approach (Lafley & Charan, 2008; Martin, 2010; McCreary, 2010; Wong, 2009). However, up to date academic publications on DT mainly consist of theoretical contributions (e.g. Kimbell, 2011; Kimbell, 2012) or the study of methods associated to DT in experimental settings (e.g. Seidel & Fixson, 2013). The use of DT in organizations has mainly been described in the business press through anecdotes of a few repeated success cases, as well as in books written by practitioners advocating DT (Johansson-Sköldberg et al., 2013). So far, more systematic empirical investigations of DT in organizations are still missing (Johansson-Sköldberg et al., 2013), and there is limited understanding of what happens when DT is adopted in a company context.

From an academic point of view, the lack of empirical foundation of how DT is used in practice makes it difficult both to theorize and to connect the concept to existing design theories and models (Kimbell, 2011, Hobday et al., 2012; Johansson-Sköldberg et al., 2013). Given the lack of coherence around the concept, a first step would be to explore organizational practices implemented under the label of DT. Therefore, this paper seeks to contribute to closing this gap in knowledge by describing what happens when large firms embrace DT and start applying it in practice. Based on an interview study of 16 large American and German firms that are using DT in various ways, this paper explores ways of implementing DT. It puts particular emphasis on how the concept is understood, used, related to existing innovation efforts, as well as who is involved in these efforts. In addition, an agenda for future research is proposed.

PREVIOUS RESEARCH

Described as a multi-disciplinary human-centered approach to innovation, DT can be interpreted as a conceptualization of the way designers think and work (Brown, 2008; Johansson-Sköldberg et al., 2013; Kimbell, 2011; Liedtka, et al., 2013). First mentioned in the early 2000s, the conceptualization is heavily influenced by the Californian design firm IDEO (Brown, 2009; T. Kelley & Littman, 2001), and management scholars who had collaborated with or observed the work of designers (Boland & Collopy, 2004; Martin, 2009).

There is little coherence in terms of understanding the concept of DT in theory and in practice. As Johansson-Sköldberg et al. (2013) and Kimbell (2011) note, DT is a rather loose term that can have several different

meanings. For example, it is often described as creativity (Johansson-Sköldberg et al., 2013) or marketed as a way of coming up with ‘breakthrough ideas’ (e.g. Brown, 2008). Representations of DT in the literature are often general and it is often described as a creative, subjective and emotional alternative to the structured, bureaucratic logic characterizing many large organizations (Brown, 2008, 2009; Rylander, 2009). Still, most proponents of DT describe how it takes account also of aspects such as feasibility and viability, and creativity within constraints (Brown, 2008). Martin (2009) argues that DT enables the balance between analytical and intuitive thinking, stressing that neither one of the logics is sufficient.

More specific descriptions of DT depend on how DT is perceived as a concept (Hassi & Laakso, 2011), ranging from a set of cognitive characteristics that managers can learn from designers to a prescriptive process where multidisciplinary teams take a user-oriented approach to come up with relevant solutions to complex or ‘wicked’ problems (Johansson-Sköldberg et al., 2013; Kimbell, 2011, 2012). In an earlier paper, we have proposed a framework (Carlgren, 2013; Carlgren et al., 2014) for understanding DT as a set of five core principles that are enacted and embodied through a number of mindsets, practices, and techniques. These are all informed by design practice but play out differently in different organizations – as a process, as separate activities, or as guiding principles for innovation work.

The most tangible representations of DT are put forward by IDEO (e.g. Brown, 2008, 2009; Ideo, 2011; Kelley & Littman, 2001), as well as the d.schools¹. These organizations propose DT as a process involving a multidisciplinary team applying a set of design-related practices to an innovation challenge and consisting a number of steps (e.g. T. Kelley & Littman, 2001; Stanford d.school, 2010) or a set of ‘overlapping innovation spaces’ (Brown & Wyatt, 2010; Brown, 2009).

The central idea of DT is that any organization can be inspired by designers (Brown & Katz, 2011; Brown, 2009). Brown (2008) refers to ‘design thinkers’ whose professional background can vary, stating that people outside of professional design can also have a natural aptitude for DT. More recently, the use of DT has been proposed as a way for individuals to develop their ‘creative confidence’ (Kelley

& Kelley, 2013). However, it has also been suggested that professional designers should play a central role in using and spreading DT, since it is argued that they have a natural ability for DT, and could take a more strategic role in the organization (Brown, 2009; Liedtka & Ogilvie, 2011).

In terms of empirical research on DT, the focus has mainly been on understanding parts of the concept such as tools (Seidel & Fixson, 2012), multi-disciplinary teams (Beckman & Barry, 2007), prototyping (Dow & Klemmer, 2011), physical environments and IT tools for collaboration (e.g. Plattner, Meinel, & Leifer, 2011, 2012). A majority of these studies are performed in experimental settings, often involving students. This paper therefore seeks to complement the descriptions of DT in the literature by describing DT in practice, thus investigating what happens when the concept meets an organizational context.

METHOD

This paper builds on interviews with large firms that claim to have applied DT in their firms. The exploratory study was designed on the basis of qualitative, open-ended data collection (Bryman & Bell, 2007). This also motivated an inductive approach where the investigation focused on identifying emerging patterns and potentially interesting avenues for future research. Since our focus was to describe different ways firms relate to and use DT a multiple case study was designed. Given that the concept of DT itself is not coherently described, we decided to study the ‘label’ DT (firms stating that they use DT) and investigate what they actually do. The concept of DT stems from the Silicon Valley-based design firm IDEO, and early implementation in firms started in the US in the early 2000s. The concept also caught interest by German investor and SAP co-founder Hasso Plattner who in 2006 founded two schools of DT (d.schools), one in Potsdam, Germany, and one at Stanford University, US. As a starting point we therefore decided to focus on firms in Germany and the US. Two interview studies were designed with similar data collection methods but with differences in terms of case selection. In Germany, we collaborated with the d.School, and in the US we used snowball sampling (Flick, 2009). See Table 1 for a firm overview.

Due to the exploratory nature of the study we tried to identify employees who were deeply involved in DT, and had insights into how the initiative had started. The interviewees were mainly individuals that had had a central role in the introduction or implementation of DT in their firms. When possible we performed additional interviews

1) Academic institutions offering DT education for master level students and executives (Stanford d.school, 2009).

with employees with a different function in order to get complementary perspectives, such as product development managers and designers. In total, we conducted 31 interviews in 16 firms (see Table 1). One firm had separate development organizations in both locations and was thus counted twice (company L in table 1). The interviews were all conducted during 2011, and mostly made by two researchers. 20 out of 31 interviews were conducted in person; the remaining ones were conducted by telephone. The interviews were semi-structured with a loose guide focusing on topics such as their view of DT and what it is, their motivation for wanting to apply it, how it was currently used, their perception of the value it had created and the challenges they had had when implementing it. Interviews lasted between 45 minutes and 2 hours. In some cases, we also got access to internal documents.

The data was analyzed on the basis of open and axial coding (Strauss and Corbin, 1998) where excerpts from interview transcripts were given keywords and then thematically sorted to identify emerging patterns across the data. The analysis was iterative and the themes were compared with the available previous research, in line with the systematic combining approach (Dubois and Gadde, 2002). There are some important limitations to our study. First, the concept of DT is difficult to grasp, and it can be questioned whether our study design allows us to study the phenomenon we are interested in. Firms may also have very different perceptions of what this is and thus we may be comparing 'apples and pears'. However, through defining our study objects as firms that state that they work with DT we have tried to address this potential weakness. To increase the trustworthiness of the study (Guba, E & Lincoln, Y, 1994), we have also carefully documented every step of the research design. However, the ambition of this exploratory study is not to provide generalizations, but some initial insights into how firms use DT in practice.

Table 1: Firm overview and data collection

Firm	Sector	Size	Started in	Number of interviews
A	Software	<100.000	2004/2005	7
B	Healthcare Products	<100.000	2010	1
C	Automotive	>200.000	2010	1
D	Telecommunication	>200.000	2008	1
E	Logistics	>200.000	2009	2
F	Software	<100.000	2006	1
G	Software	<10.000	2006/2007	2
H	Healthcare	>100.000	2003	3
I	Pet Care	>50.000	2010	1
J	Retail	>300.000	2008	1
K	Healthcare	>50.000	2005	1
L (US)	Consumer Electronics	>300.000	2006	2
L (DE)	Consumer Electronics	>300.000	2010	2
M	Finance	<10.000	2007/2008	1
N	Consumer Products	>100.000	2004	3
O	Finance	<100.000	2008	2

RESULTS

The empirical description of the role of DT in these firms is structured around four themes: perception of the concept, how it is used, integration of DT with existing product development, and who is using DT.

Perception of the term design thinking

When interviewees were asked to define or explain what they mean with DT, most struggled to provide a clear answer. As a result, answers varied greatly. Some would go back to their initial understanding of DT, others would quote literature, while others yet would give extensive descriptions of how they actually work in the firm. A recent fad discussion also seemed to stir emotions; one interviewee took a clearly defensive position in explaining her perception of the concept. The perception of DT thus varied to a large extent among the interviewees; not only was the term described differently in the various firms, according to the interviewees there were often diverse perceptions within a single firm. It was however possible to find some clusters among the answers:

Some described DT in very general terms as in *“user-centered innovation or a current name for really good user centered design”*, while other interviewees gave more detailed descriptions of their perception of DT. For some interviewees DT equaled the use of design methodologies, others described it as a process to develop new ideas or new products/services or to systematically solve problems. Even though the term ‘process’ was used, it was often referred to as iterative and non-linear.

DT was also described as a mindset or a set of principles: *“I would have said process two years ago, but I think it’s a mindset. I think it’s a mindset that puts the user first, focuses on finding differentiated and true insights, having a bias for action, [and] iterating constantly”*. When DT was described as a set of principles, these were not referred to as consecutive steps in a process; instead they were used as a way to relate to problems and the work at hand: reframing of the initial problem, iterations, prototyping. One such principle was putting the main focus on making sure that the questions were the right ones, another one was user centeredness: *“... for me I guess it’s maybe the sort of user centered innovation that is the strongest part of this. Really placing the user above all”*.

Others yet referred to DT as a combination of mindset and methods: *“For me design thinking is not a process per se, there’s not a blueprint where you can say on day one you do this activity, on day two you do this activity. You first*

have to have the mindset, and then the next level is you have to have a set of techniques and tools and approaches that you can use in different circumstances to help you get to the next phase of where you are in your project. It’s more like a toolbox, as opposed to a step-by-step plan”.

Use of design thinking

When the interviewees talked about how DT is used, several tools were mentioned: for instance different ideation techniques, techniques for more empathic customer meetings/observations, creativity tools for concept generation and prototyping methods.: *“Another thing we’re trying to do with a small group is put together an innovation toolkit which is basically to get people kind of a one stop shop for creativity tools”*. Emphasis was also put on what was more broadly described as new ways of working: an iterative way of working, incorporating user feedback, diverging and converging, and prototyping in the sense of creating coarse objects that can serve as a tool for communication and feedback.

Many of the interviewees also talked about designing space for creativity and innovation, and how they had tried to create an environment that would encourage a DT mindset/way of working and open up for collaboration. These were referred to as *war rooms* or *creativity rooms* with flexible furniture solutions, an abundance of material such as post-its, markers, whiteboards, glue, scissors, etc. The most extreme case of creating physical space for DT activity was one firm converting a whole warehouse into a design center and prototyping space to test new ideas and work flows.

Some firms consciously strived to create a culture that nurtures innovation based on what they perceived as DT values, for instance empathy training, having a bias for action, learning from failure, and creating a new outlook on problems and their solutions. *“Our focus was less on kind of novel discovery of new needs and opportunities, and our focus was more on how do you get the developers involved and have empathy for somebody using the product”*.

One way of achieving such culture changes was through the conscious interplay between work environment and behavior; it was mentioned how the environment should be as ‘simple’ as possible to contribute to a way of working that can be messy, where failure is accepted, and where team members dare stepping outside of the ordinary: *“And you know people would move the furniture around and some of the facilities people would get really mad and I had to get involved but we would just get them to develop new habits, like. When you are in the process of doing this stuff, breaking*

the rules is ok, like the rules are what are preventing you from being innovative, and so we'd encourage them to break these rules and try new things”.

Design thinking in relation to product development efforts

Most of the investigated firms had a formal product development process, often including structured front-end activities. In many firms, DT was generally connected to these processes in some way; often in the front end for user research, ideation and concept generation, and sometimes throughout the whole development process.

Often DT was described as a formalized, prescriptive part of the development process. The concept could be integrated through adding or transforming bits and pieces of the current process, often in the front end: *“In our 90 day process we actually broke it down into very very discrete you know checklists if you will, I wouldn't say it's like a water fall process, but it's things that you need to be concerned about at different phases within the project, and what we have done is we have built design thinking principles in to them”*. There were also cases where an existing process was complemented by an entire new process step that had not been done previously, such as ethnographic user research. Another firm had no innovation process in place when they first came in contact with DT, but inspired by DT and internships at IDEO they created their own process for radical innovation, which they combined with methods for continuous improvement.

In other cases DT would be used inside the formal development process, but not as required or specified activities: *“So our focus has really been on the R&D employee and their experience here and elsewhere, trying to get them to do more creative thinking, idea generation and really doing more thinking out of the box”*. Further, in some firms DT was only used in a few chosen development projects, often major strategic innovation projects for solving complex problems, or projects chosen for maximum exposure of the DT methods internally.

One of the case firms in the service sector had an established innovation process, with an open innovation arena where they collaborated with retail and technology firms. They got inspired by DT and incorporated elements of it into their process, while realizing that some of what they already did also resembled DT: *“We don't use the pure design thinking process, sometimes you have a model which is similar to the design thinking model, but nobody is aware that they are doing this. What we're doing here is that we make nearly the same. But we don't call it DT process. It's*

our innovation process. But it's to 90% the same”.

In some firms DT was only implemented on a small scale, and had to fit other and sometimes larger, initiatives going on such as agile or lean product development. Here DT was seen as a complement, and the use could be completely intertwined: *“Design thinking and Agile go together really well ... [we would] go through this design thinking exercise and come up with a set of new action items for your kind of your list for the scrum project”*.

DT was also used outside of the formal development process. It could be side projects for generating radical ideas; many of the firms who were in the early phases of implementing or evaluating DT had students or external consultants look at a particular problem, and they then evaluated the ideas that sprung from the project in terms of possible business viabilities. Some interviewees mentioned how DT was used for internal purposes, such as improvement of HR or financial processes; completely detached from development of the product/service offer. *“When we got in to the project it was just literally a couple of days in to it we realized it wasn't the software, it was the policies that were the problem [...] So we ended up working with the HR- organization. [...] And so when we went back to present this project to [the CEO], he kind of sat back and just very quietly said ‘you redesigned the policy’, we were like, yeah, and he's like, ‘I thought you would design the product’, and we were like ‘yeah we will’ but first we had to design the policy. And this light went on when he basically said, ‘you design anything’ “.*

Who uses design thinking

With DT being put forward as an approach inspired by designers – but not necessarily to be used by designers only – it is relevant to also study who is actually using DT, as well as the role of professional designers in relation to DT in the firms. While the firms in the study had varying experience of using DT, they were all in different stages of spread of DT. Often a group of ‘DT experts’ was responsible for DT in the organization, and this group had different roles. When the role of the expert team was to teach and spread DT inside the organization, the ambition was often that other employees would later use it on their own: *“You can think of it as an internal innovation consultancy group so like an internal IDEO, to really bring the concept of design thinking to [our firm] and spread it throughout the organization”*. In other cases the expert team would have a more supporting role in facilitating teams to work with DT methods: *“Eleven of us work together to kind of help, you know our goal is*

to help facilitate people, being creative, working together, creating ideas into our idea system process, and participating in different brainstorming events and things". Sometimes a DT expert group would act as an innovation team, running DT projects, often in collaboration with non-experts (such as individuals involved in providing services, or product development engineers). Often the expert teams had mixed roles. There was a common understanding among the interviewees that DT cannot be taught by the book, it has to be experienced. Therefore when expert team members were spreading DT, in practice they would often be involved in development projects facilitating and participating in the development team's work.

The 'DT experts' came from a range of disciplines and were in many cases not educated as designers. The approach to use professional designers or non-designers differed to a large extent between the firms; one firm had a large expert group that consisted almost exclusively of designers, while in another one the team was mixed: *"The team was very mixed, so we had multiple specialties, we had people who were designers, either product designers or interaction designers, graphic designers, we also had folks with background in psychology, sociology, anthropology, we had business folks, we had a couple of ex McKinsey guys on our team as well, we had software architects, prototypes, usual specialists, that kind of thing"*. It was also found that even though professional designers could excel in DT, they were not necessarily the best suited for spreading and teaching it: *"We started with mostly the designers, assuming that they were going to be best at it, the interesting finding was that not all the designers were actually great at it, that understanding how to take design thinking which was so inherent in their own personal DNA, and empower others to do it, was a skill set that wasn't necessarily given, right [...] And there was also a finding that a lot of designers want to hold that close to their chest, like 'this is a skill set that is unique to me, why would I give that away'. Out of the 200 people we have trained, we have got like, I don't know, maybe 20 of them are designers, but the rest of them are engineers, product managers, people from HR, you know, all different backgrounds"*.

Some interviewees stated that anyone with the right attitude could become a design thinker, although others remained more skeptical. One interviewee focused on personality traits instead of profession, and how the right combination of individuals, based on their attitude towards problem solving and the way they learn, would create the perfect team.

When a team used DT, the cross-functionality of the team was often stressed. In some firms, the use of DT went beyond expert groups and development teams. Employees were taught and encouraged to use DT on a personal level for approaching any problem, such as becoming a better manager, or in order to solve conflicts between team members.

Finally, most of the DT activities were carried out by employees - if outsiders were involved it was often in the initial stages of implementation. Most firms seemed to prefer to have the competence in-house once DT was a bit more established. In some cases students were involved in separate projects, often as an attempt for the firm to investigate whether DT was an interesting concept to invest in.

PROPOSING AN AGENDA FOR FUTURE RESEARCH

The concept DT is gaining recognition and seems to claim different goals; yet the meaning of DT remains ambiguous and empirical research is scarce. This paper set out to explore current practices of implementing and using DT in different firm contexts, and to propose an agenda for future research, outlining some topics that merit further investigation.

Perceptions of design thinking

The paper showed that interviewees defined DT as a number of methods, a process, specific mindsets, principles and culture. It is interesting to note that while many existing publications focus on methods or process (e.g. Seidel & Fixson, 2012) many of the interviewees perceived DT as a mindset or a culture. One reason could be the fact that proponents of DT like Tim Brown, Tom Kelley or Roger Martin, as well as institutions like the d.Schools, have described DT in terms of the way they work or how people could work, focusing on actual practices. It is interesting to note that many interviewees had difficulties explaining what DT meant to them, despite many of them having a central role regarding DT in their organizations. Another potential explanation is the connection to design that is new or unfamiliar to many.

Johansson-Sköldberg *et al.* (2013) suggested that striving for an ostensive definition of DT is a cul-de-sac. Yet, there is a need for some kind of shared understanding to enable systematic research on the phenomenon. A discussion of how to describe DT needs to take into account the various expressions it takes when put into use in various settings. For example, several descriptions of DT refer to a specific process (e.g. Brown, 2008, 2009; Kelley & Littman, 2001;

Stanford d.school, 2010), while others refer to cognitive aspects such as the ability to combine different logics (e.g. Martin, 2009). How can DT be discussed in a way that encompasses the various interpretations of the concept? A language for discussing DT that is flexible enough to allow for various interpretations is needed.

Using design thinking

The interviews revealed a wide variety in terms of how, when and by whom DT is used. In many companies DT was used for creating new concepts for offerings for the market, and integrated in the front end of a formal development process (Brown, 2009; Martin, 2009). In some companies DT was used as the basis to create a separate process for more radical ideas, something that innovation literature has long advocated for. In yet other companies, DT was considered something that everyone should always do, aiming at integrating it with the general culture. The findings of this study indicate that when these firms implemented DT, the main use of DT was in early, strategic phases of innovation projects, less in executional phases of product development, which is where design has typically been included. In line with the suggestions by some authors (e.g. J Liedtka & Ogilvie, 2011) the study found that several companies also used DT to address managerial problems, e.g. for developing corporate strategy or redesigning policies. Thus, it seems that DT does not replace traditional design; but rather adds a new field of work, mainly connected to the early, strategic phase of innovation.

We still know little about how DT is used and how it relates to design in a broader sense? Is DT a new way to design, or a new way to organize any activity, which is not necessarily related to traditional design activity? Is DT different from other user-centered approaches to innovation? Can design thinking be seen as a new management concept? It also raises questions on how DT is translated into different organizational settings and how it influences existing organizational and innovation practices. Closely linked to how DT is understood and used are also questions related to sensemaking and the value generated by DT. Can the value of DT be articulated or does it depend on the context in which DT is translated? More empirical studies are needed to better understand this dimension.

Who uses design thinking

The issue of who uses DT, or who is the ‘design thinker’ (typically defined as someone using DT or someone has the right personality for using DT) has been approached

differently in the literature. While Martin (2009) as well as Liedtka and Ogilvie (2011) advocate that DT is for managers, others argue for its use in multidisciplinary teams (e.g. Beckman & Barry, 2007), or even state that everyone can be a design thinker (Brown, 2008). This openness to different disciplines and backgrounds was reflected in the sample of our study. Interviewees stated a variety of backgrounds ranging from traditional design disciplines, marketing to management and software engineering. While individual backgrounds varied we also found a spread in terms of how DT expertise was used or created. Some of the interviewees put more emphasis on creating a team with the right mix of individuals, than on the specific abilities of an individual. There was also a strong focus on the skills needed to do DT and a shared view that these skills were learnt through experience.

Our study showed that DT was used by a variety of people and the role of individual and team competences and skills were often put forward as critical. This raises questions around how DT can be learned and taught? Are professional designers best suited for DT work, or can anyone become a design thinker (sometimes referred to as the ‘democratization of design’)? In the study, design as a term was sometimes referred to as problematic among the interviewees, and there were reports of friction around the view and role of professional designers. This indicates the need for clarification and a better articulation of the distinct skills and abilities of professionally trained designers, and it also puts emphasis on the role of an existing design function in DT initiatives. There was also some evidence of formation of DT expert teams in the study, suggesting a possible transformation of design from a line to a support function (Mintzberg, 1979). It would be very interesting to further research this phenomenon and the consequences of such development for the role of designers in large organizations.

CONCLUSION

Through providing examples of how DT is implemented in a variety of large firms this paper contributes to the building of a better understanding of DT in practice. Since there is a scarcity of empirical research on the use of DT in organizations, this type of empirical contribution is a necessary contrast to how DT has been previously described. This paper has shown that perceptions of DT vary a lot among individuals using DT, and also that it is used in a variety of ways in organizational settings. Depending on how DT is defined it is used for different purposes and by different people. The empirical insights offered by this paper

are intended to initiate a more critical discussion of the use of DT, and an agenda for future research is proposed. Since the ‘design part’ in DT is often used to motivate what sets DT apart from other concepts promising increased innovativeness, the role of design and designers in DT are thus crucial topics for further investigation – both in design and innovation research.

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