DESIGN THINKING IN THE MANAGEMENT DISCOURSE: DEFINING THE ELEMENTS OF THE CONCEPT

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ABSTRACT
Many authors suggest that design thinking can provide significant value to innovation and management. Furthermore, the concept of design thinking is gaining increasing attention among managers. Despite of the rising interest, no shared conceptualization or a clear-cut breakdown of the concept seems to exist. However, in order to evaluate these claims and further develop the understanding on design thinking, its use, application, benefits and limitations, a shared understanding and conceptualization of the concept is needed. Furthermore, as there are two differing discourses discussing design thinking, one in design and the other in management, in this paper the focus is on the management discourse on design thinking. Building on a literature review of the management discourse, this paper proposes an initial framework portraying the elements of design thinking. In the framework we conclude design thinking as consisting of three dimensions: practices, thinking styles, and mentality. Each dimension contains a set of elements of design thinking – methods, values, and concepts that repeatedly surfaced across the reviewed literature.

Keywords: design thinking, innovation process, evolution of design thinking, practices of design thinking, management

INTRODUCTION
Interest in alternatives for a linear, analytical, and quantitative approach to innovation has led an increasing number of managers to the concept of design thinking (e.g. Zaccai in Lockwood, 2010). However, despite of the increasing attention, no shared conceptualization or a clear-cut breakdown of the concept seems to exist. In order to further develop the understanding on design thinking, its use and application, as well as its benefits and limitations, a shared understanding and conceptualization of the concept is needed. To advance those ends, based on a review of selected literature, this paper proposes a framework that summarizes the elements of design thinking. Although widely considered to provide significant value to management, the concept of design thinking is broad (Cooper, Junginger & Lockwood, 2009), and the term is considered as confusing; there are debates over what exactly is meant by it, and how, if at all, it differs from e.g. creativity, innovation or systems thinking (Kimbell, 2009). On one hand, design thinking is seen as a remarkable phenomenon in its own right, described for example as a “powerful, effective, and broadly accessible” approach to innovation, “that can be integrated into all aspects of business and society, and that individuals and teams can use to generate breakthrough ideas that are implemented and therefore have an
impact” (Brown, 2009, p.3), or as “the next competitive advantage” (Martin, 2009). Furthermore, rather high expectations are linked with the design thinking approach, highlighted by statements such as, “great innovators and leaders need to be great design thinkers”, and “design thinking is a catalyst for innovation and bringing new things into the world.” (Plattner, Meinel & Leifer, 2011, xiii). However, on the other hand, there exists significant doubt about the validity and novelty of the concept. Some disregard it entirely as nonexistent, while others view it as nothing new, such as Donald Norman, who writes “Design thinking is a public relations term for good, old-fashioned creative thinking” (Norman, 2010).

Although the concept is widely discussed in numerous articles and books, a search for a definition does not produce a concise portrayal or a clear-cut breakdown of what the concept encompasses. Furthermore, it becomes evident that there are two differing discourses discussing design thinking. Johansson and Woodilla (2010) clearly point out these two separate discourses and name them as the ‘design discourse’ and the ‘management discourse’. The former discusses “the way designers think as they work”, and is an academic discourse with a history of roughly 50 years. The latter discourse regards design thinking as a “method for innovation and creating value”. This management discourse is a more recent one, appearing around the change of the millennium, and focuses on the need to improve managers’ design thinking skills for better business success. (ibid.)

Adopting this division of two discourses, we focus on the management discourse on design thinking. The confusion and disagreement surrounding the concept calls for investigations that provide clarity and common understanding, paving ground for a more fruitful discussion on the issue. This paper seeks to provide such common ground by summarizing how design thinking is depicted in the current management discourse, and by presenting a three dimensional framework that emerged from the current management discourse concerning design thinking. The research presented in this paper set out to identify common terminology and characteristics used to describe the concept of design thinking, i.e. to identify the elements that constitute design thinking in the management discourse. This paper proposes an initial framework for the concept of design thinking, describing it as consisting of three dimensions: practices, thinking styles, and mentality. Each dimension contains a set of elements of design thinking – methods, values, and concepts that repeatedly surfaced across the reviewed literature.

The paper starts by explicating the research methods utilized in the research. Then, before moving on to the results of the literature review, we first briefly discuss the two discourses on design thinking, providing an overview on their development and nature. After this, based on a study of relevant literature we present the framework summarizing the management view on design thinking. We end the paper with a discussion including suggestions for future research directions.

**RESEARCH METHODS**

The aforementioned division of the discussion on design thinking to the ‘design’ and ‘management’ discourses by Johansson and Woodilla (2010) was used as a starting point for the study. However, to validate this division and generate further understanding on what these two discourses actually consist of and how they differ from each other, interviews were conducted with ten experts from three countries; the Netherlands,
Finland, and the United States. The interviews were aimed to discover where the interviewees representing both of the two discourses considered the origins and the roots of design thinking to be and what they considered the concept itself to denote to. The specialists interviewed for this research included four academics from the field of design methodology and six experienced practitioners with a design education (industrial design or architecture). All interviewees were familiar with the concept of design thinking prior to the interview and had formed their own understanding of what the concept entails. The interviews were semi-structured, explorative in nature. All interviews were conducted during 2010.

Following the expert interviews, a review of literature was conducted in order to synthesize the elements constituting design thinking as it is seen within the current management discourse. This paper does not aim to present an all-inclusive literature review, but rather focuses on some key texts, that form a sufficient basis to draw an overall image of the current management discourse on design thinking. Two groups of literature were chosen for the review. First, there is the literature in the management discourse that is often cited or considered as central pieces of the management discourse drawn from e.g. Johansson & Woodilla (2010), and Kimbell (2009). These include widely acknowledged books and articles in magazines such as Harvard Business Review, that address the concept of design thinking directly. Examples of these works include Brown (2009, 2008), Kelley (2001), Martin (2009).

The second reviewed group composed of influential professional journals that have paid specific attention to design thinking. These include the Design Management Institute’s Review and Journal that were considered relevant due to their focus on design management and the recent issue on design thinking, as well as two special issues of the Journal of Business Strategy: Design and Business in 2007, and Practice of Innovation: Design in Process in 2009. These two special issues were considered relevant due to their specific combination of business and design. Also MIT Sloan Management Review’s special issue on design thinking from 2009 was included in the review. In addition, relevant individual papers from fields such as business education (e.g. Dunne & Martin, 2006) were also reviewed. The papers included in the review addressed design thinking directly, i.e. the phrase appeared in the title or the abstract.

Altogether over 50 articles or books containing the term were reviewed, of which 32 were considered useful in addressing the characteristic elements of design thinking, and were used for building the framework. It is noteworthy and descriptive of the “fad” status (Johansson & Woodilla, 2010) of the concept, that several articles that used the term design thinking in the title, did not actually address the concept at all, but rather discussed issues linked more broadly with design, or with a more specific focus such as idea generation. The reviewed literature contained articles describing the point of view of representatives from various prominent organizations such as HP (Sato et al. 2010), 3M (Porcini 2009), IBM (Clark & Smith 2008), IDEO (Brown 2008, 2009; Kelley 2001), SAP AG (Holloway 2009), and UK’s Design Council (Ward, Runcie & Morris 2009) and also included several articles, where the concept of design thinking was explored by interviewing practitioners and experts (e.g. Drews, 2009; Carr et al., 2010). The articles found relevant were screened for characteristics or qualities describing the concept of design thinking. These characteristics were collected as concise explications and grouped
according to similarity. The resulting elements were then arranged under three unifying dimensions according to thematic similarities.

**DESIGN THINKING MOVES FROM DESIGN STUDIES TO MANAGEMENT DISCUSSION**

Johansson and Woodilla (2010) provide a helpful overview of the field of design studies regarding the formulation of the concept of design thinking, or as the phenomenon is also addressed to; designerly way of knowing (Cross 1982), or how designer’s think (Lawson 1980). They describe how the foundations of the concept formulated within the discourse through seminal works such as Simon (1969), Lawson (1980), Schön (1983), Rowe (1987), and Cross (1982, 2001). In the following we discuss how the views of the interviewed academics and practitioners in the field of design coincide with or contrast the depiction of Johansson and Woodilla. In the interviews, the experts were asked where they consider the roots of design thinking to be, where it has originated, and around what time.

In line with Johansson and Woodilla, the interviewed representatives of the design discourse view the beginnings of the design thinking paradigm to take place in the early sixties when research embarked on finding out what designing is and how could design as a process and as an activity be improved. The interviewees describe the development of the concept to align with the overall development of design research from the first conferences on design methods in the early sixties (Cross 2007) onwards. Within the design research stream, the interviewed academics specifically link design thinking to the analysis of the designers’ thinking processes and regularly mention Simon (1969) and Schön (1983) as keystone works with notions such as; “The concept of design thinking begun to formulate after Schön published the Reflective Practitioner in 1983.”

Johansson and Woodilla describe the expansion of the design thinking discussion from the design discourse to the management context as initiated and fuelled by articles and books written by principals from design consultancies, such as IDEO (Brown, 2008, 2009; Kelley, 2001). These texts typically describe the working styles of designers with a proposal of their usefulness in other contexts outside the field of design. Indeed, despite all the confusion and debate around design thinking, what is rather obvious, is this recent expansion of design into new arenas and target areas, such as strategy, services or organization design, that go beyond the realm of traditional design that is linked tightly with physical objects (e.g. Cooper, Junginger & Lockwood 2009; Kimbell 2009). It seems even in the military, design is now considered to represent “the most significant change to our planning methodology in more than a generation” (Cardon & Leonard 2010). The interviewed practitioners also note the relevance of service design as a more established context of utilizing design methods outside the realm of tangible objects.

The perception of design thinking originating at IDEO was supported by the views of the interviewed practitioner experts with statements such as “The roots of design thinking ultimately came from IDEO and their notion of user centered design.“ Stanford University’s d.school was also linked strongly to IDEO and the birth of the design thinking concept. Also the representatives of the design discourse acknowledged the role of IDEO, and specifically the CEO Tim Brown, in the birth of the recent managerial discourse. Since in the design research stream, the term design thinking is used predominantly to refer to the cognitive processes of a designer and in the more recent
managerial discussion it refers to a wider approach to innovation, many of the interviewed academics felt that there are two entirely different subjects called by the same name and that in much of the recent discussion there are no parallels to the actual design thinking concept that surfaced in design research in the 1980’s. It was also noted that much of the recent discussion (specifically Brown) does not refer to any central literature on design thinking in the design research tradition. Interestingly, the interviewed practitioners who were acknowledgeable of the ongoing managerial discussion on design thinking were mostly unaware of the 50 years of ongoing design discourse linked to the concept.

In summary, as proposed by Johansson and Woodilla, the academics considered the roots of design thinking to go back to the 1960’s, whereas the practitioners considered the concept a rather recent one, spurring during the 2000’s. Figure 1 presents a light summary of the interviews, including views from the interviewees representing both the design discourse and the management discourse. The figure depicts the view of the perceived origins of design thinking and the key literature referred to by the interviewees.

**Figure 1** Roots of design thinking: views from the two discourses

|--------|--------|--------|--------|--------|

"As the start of the design methodology movement...late 1960's in the UK..."

"The beginning of the design thinking paradigm was when research embarked on finding out what designing is and how could designing be improved."

"d.School and Palo Alto region..."

"Design thinking ultimately came from IDEO."

"The concept of design thinking begun to formulate after Schön published Reflective Practitioner in 1983."

**DEFINING DESIGN THINKING**

Analysis of the selected literature discussing the concept and application of design thinking in different contexts resulted in three main groups of elements, or components. These were named as practices, thinking styles, and mentality. Figure 2 summarizes the elements of design thinking, and suggests a three-dimensional framework explicating the
management view of design thinking. Each dimension contains a set of elements that were presented as key ingredients of design thinking across the reviewed literature.

<table>
<thead>
<tr>
<th>PRACTICES</th>
<th>THINKING STYLES</th>
<th>MENTALITY</th>
</tr>
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<tbody>
<tr>
<td>• HUMAN-CENTERED APPROACH</td>
<td>• ABDUCTIVE REASONING</td>
<td>• EXPERIMENTAL &amp; EXPLORATIVE</td>
</tr>
<tr>
<td>E.g. People-based, user-centered,</td>
<td>E.g. The logic of &quot;what could be&quot;, finding</td>
<td>E.g. The license to explore possibilities,</td>
</tr>
<tr>
<td>empathizing, ethnography, observation</td>
<td>new opportunities, urge to create</td>
<td>risking failure, failing fast (e.g. Brown</td>
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<td>(e.g. Brown 2008; Holloway 2009; Ward et al.</td>
<td>something new, challenge the norm (e.g.</td>
<td>2008; Fraser 2007; Holloway 2009)</td>
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<td>2009)</td>
<td>2009; Martin 2009)</td>
<td></td>
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<tr>
<td>• THINKING BY DOING</td>
<td>• REFLECTIVE REFRAMING</td>
<td>• AMBIGUITY TOLERANT</td>
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<tr>
<td>E.g. Early and fast prototyping, fast</td>
<td>E.g. Rephrasing the problem, going</td>
<td>E.g. Allowing for ambiguity, tolerance for</td>
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<tr>
<td>learning, rapid iterative development</td>
<td>beyond what is obvious to see what lies</td>
<td>ambiguity, comfortable with ambiguity,</td>
</tr>
<tr>
<td>cycles (e.g. Boland &amp; Collopy 2004;</td>
<td>behind the problem, challenge the given</td>
<td>liquid and open process (e.g. Boland &amp;</td>
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<td>Lockwood 2010; Rylander 2009)</td>
<td>problem (e.g. Boland &amp; Collopy 2004;</td>
<td>Collopy 2004; Cooper et al. 2009; Dew</td>
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<tr>
<td>• VISUALIZING</td>
<td>Drews 2009; Zaccar in Lockwood 2010)</td>
<td>2007)</td>
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<tr>
<td>E.g. Visual approach, visualizing</td>
<td>• HOLISTIC VIEW</td>
<td>• OPTIMISTIC</td>
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<td>intangibles, visual thinking (e.g. Carr et</td>
<td>E.g. Systems thinking, 360 degree view</td>
<td>E.g. Viewing constraints as positive,</td>
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<td>al. 2010; Drews 2009; Ward et al. 2009)</td>
<td>on the issue (e.g. Dunne &amp; Martin 2006;</td>
<td>optimism attitude, enjoying problem</td>
</tr>
<tr>
<td>• COMBINATION OF DIVERGENT AND</td>
<td>Fraser 2009; Sato 2009)</td>
<td>solving (e.g. Brown 2008; Fraser 2007;</td>
</tr>
<tr>
<td>CONVERGENT APPROACHES</td>
<td></td>
<td>Gloppen 2009)</td>
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<tr>
<td>E.g. Ideation, pattern finding, creating</td>
<td>• INTEGRATIVE THINKING</td>
<td>• FUTURE-ORIENTED</td>
</tr>
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<td>multiple alternatives, (e.g. Boland &amp;</td>
<td>E.g. Harmonious balance, creative</td>
<td>E.g. Orientation towards the future, vision</td>
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<tr>
<td>Collopy 2004; Drews 2009; Sato et al. 2010)</td>
<td>resolution of tension, finding balance</td>
<td>vs. status quo, intuition as a driving force</td>
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<tr>
<td>• COLLABORATIVE WORK STYLE</td>
<td>between validity and reliability (e.g.</td>
<td>(e.g. Drews 2009; Junginger 2007; Martin</td>
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<td>E.g. Multidisciplinary collaboration,</td>
<td>Brown 2008; Fraser 2009; Martin 2010)</td>
<td>2009)</td>
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<td>involving many stakeholders, interdisciplinary</td>
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<td>teams (e.g. Dunne &amp; Martin 2006; Gloppen 2009;</td>
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<td>Sato et al. 2010)</td>
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*Figure 2* Three-dimensional frameworks explicating the common elements of design thinking, as depicted in the management discourse.

The framework presented above is more suggestive than conclusive. In the following sections, the three dimensions and the elements forming them are discussed in a compact manner with the aim of providing a clear overall picture of the division.

**Practices**

The “practices” –category comprises of elements that are closely related to concrete activities, describing tangible approaches, ways of working, activities and the use of particular tools. The elements included in the category include: human-centered approach, thinking by doing, visualizing, combination of divergent and convergent approaches, and collaborative work style.

One of the most prominently emphasized issues in design thinking is its inherently and thoroughly human-centered approach - “putting people first” (Brown, 2008; Porcini, 2009; Ward et al., 2009). Authors were extremely consistent in emphasizing developing empathy towards and understanding of the customer/users (Brown, 2008; Clark & Smith, 2008; Dunne & Martin, 2006; Holloway, 2009; Junginger, 2007; Lockwood, 2009,
2010b) and even “being in love” (Porcini, 2009) with them. Some authors even go as far as labeling design thinking as synonymous with “customer, user or human-centered design” (Sato 2009). The use of observational and ethnographic methods (Beckman & Barry, 2007; Brown, 2008; Carr et al., 2010; Dunne & Martin, 2006; Lockwood, 2010) is seen as a key means to achieve a deep and empathetic understanding of the customer. Beyond empathizing and understanding, collaborative design with the customers (Boland & Collopy, 2004; Brown, 2008) is suggested as a viable approach.

**Thinking by doing** refers to the iterative and highly tangible approach favoured by designers. Knowledge creation in design thinking is practical, as the process proceeds through reflection-in-action (Rylander, 2009). The development cycles of the iterative approach are described as systematic (Sato et al., 2010) and rapid (Carr et al., 2010; Holloway, 2009; Lockwood, 2010). Early - “from day one” (Brown, 2008) - and continuous prototyping (Drews, 2009; Fraser, 2007, 2009; Holloway 2009) is seen as necessary and beneficial throughout the entire process. Prototypes are seen to facilitate thinking and knowledge creation by means of idea formulation and demonstration (Lockwood, 2009), to make concepts concrete (Sato et al., 2010), and to help the exploration of numerous possible solutions (Fraser, 2007, 2009). In essence, prototypes can be seen as a tool for stimulating thinking and exploring ideas, not merely as representations of the products (Boland & Collopy, 2004).

Closely related to prototyping, **visualizing**, i.e. expressing oneself in media other than words and symbols (Brown, 2009) is seen as the dominant sensemaking mode of design thinking (Rylander, 2009). Visualization of intangible concepts, models and ideas is seen as essential (Carr et al., 2010; Drews, 2009; Lockwood, 2010), functioning as a tool aiding common understanding (Ward et al., 2009), allowing ideas to be shared and discussed (Junginger, 2007) and revealing relationships that are not accessible in verbal presentations (Sato et al., 2010).

**Combination of divergent and convergent approaches** refers to widening the scope and then moving towards a preferred solution by selection and synthesis. The process of design thinking is described as having divergent beginnings, i.e. creating multiple alternatives using various methods (Drews, 2009) without assuming that the existing alternatives, or the first ones that were thought of, include the best ones (Boland & Collopy, 2004). The wide range of ideas does not need to be limited to the very early stages, as openness to exploring multiple paths toward a solution (Drews, 2009) is seen as important. Recognizing patterns (Brown, 2009; Carr et al., 2010; Sato et al., 2010) and relationships in the broad number of diverse variables, including conflicting, ambiguous, or paradoxical data is central to design thinking.

Contrasting the age-old and commonly abandoned notion of a lone genius, a **collaborative work style** is emphasized as integral to design thinking by virtually all authors. The importance of involving a wide range of stakeholders (e.g. Drews, 2009) is seen as a key approach. This most typically takes the form of using interdisciplinary teams (Brown 2008, 2009; Clark & Smith, 2008; Dunne & Martin, 2006; Holloway, 2009; Lockwood, 2010; Sato et al., 2010). A collaborative work style is seen as important in tackling complex and “wicked” problems through gaining knowledge from many fields and disciplines (Gloppen, 2009), promoting diverse perspectives (Dunne & Martin, 2006), and merging them in a meaningful and novel way (Dunne & Martin 2006). Some authors also emphasize that thinking is not something done exclusively inside one’s head,
but is often accomplished in interaction with other people (Boland & Collopy, 2004), using expressions such as collaborative integrative thinking (Dunne & Martin, 2006).

**Thinking styles**

Elements categorized into the “thinking styles” – dimension relate to issues such as cognitive styles, methods of thinking and processing information. These elements are: *abductive reasoning, reflective reframing, holistic view and integrative thinking.*

*Abductive reasoning,* or “the logic of what might be” (Lockwood, 2009), in addition to deductive and inductive reasoning is emblematic to design thinking. Whereas inductive reasoning has to do with proving through observation that something works, and deductive reasoning has to do with proving through reasoning from principles that something must be (Lockwood, 2009), a designer uses abductive reasoning to move from what is known to the exploration of what could be (Fraser, 2009) - to say, “What is something completely new that would be lovely if it existed but doesn’t now?” (Dunne & Martin, 2006). Designers use abduction to generate ideas, challenge accepted explanations, and infer possible new worlds (Martin, 2009, p.65). It’s a skill that plays a critical role in design thinking, and is a pre-condition for intelligent designing (Dew, 2007).

While developing solutions to design problems is a well-recognized skill of designers, the ability to think up new ways of looking at the problem in the first place is key as well (Dew, 2007). This ability is referred to here as *reflective reframing* of the problem or situation. Design thinking is seen to inherently include questioning the way the problem is represented (Boland & Collopy, 2004), looking beyond the immediate boundaries of the problem to ensure the right question is being addressed (Drews, 2009) and going beyond what is obviously stated to see what lies behind the problem (Zaccai in Lockwood, 2010). Identifying, framing, and reframing the problem to be solved are seen as equally important as solving the problem or finding an appropriate solution (Reynolds in Guterman, 2009; Beckman and Barry, 2007). The process of challenging the original problem is not limited to the beginning of the process, but is ongoing, incorporating the findings already gained to re-phrase the problem (Drews, 2009).

The ability to adopt a *holistic view* - a 360° understanding (Holloway, 2009) of the problem including issues such as the customer’s needs, the end-user’s environment and social factors is inherently linked to design thinking. This understanding includes not only the customers’ functional needs, but also the customers’ emotional, social and cultural needs (Sato, 2009). Some authors use the term systems thinking (e.g. Fraser, 2009) to describe visualizing a problem as a system of structures, patterns and events, rather than just the events alone—and understanding the impact of changes in one component on the others, and on the system as a whole (Dunne & Martin, 2006) and the ability of connecting external form with internal functionality or holistic vision with specific attention to detail (Ward et al., 2009).

One of the foundations of design thinking is said to be bringing competing constraints into a harmonious balance (Brown, 2009). Most authors see this as being achieved through *integrative thinking,* which is about identifying salient aspects (Brown, 2008, Dunne & Martin, 2006) of problems and being able to face two (or more) opposing ideas or models and instead of choosing one versus the other, to generate a creative resolution of the tension in the form of a better model, which contains elements of each model but is superior to each (Brown, 2008; Fraser, 2009; Martin, 2010). Design thinking is seen to
include achieving a natural balance between the technical, business, and human dimensions (Brown, 2008; Clark & Smith, 2008; Holloway, 2009), balancing human-centeredness with company-centricity throughout the cycle (Sato et al., 2010), reliability with validity (Martin, 2010; Sato, 2009), exploitation with exploration (Martin, 2010), and analytical thinking with intuitive thinking (Martin, 2010; Porcini, 2009; Sato et al., 2010).

**Mentality**

The mentality-category refers to the mentality of both the individuals immersed in the work and the mentality portrayed by the organizational culture. Here “mentality” describes the orientation towards the work at hand, and the mental attitude with which the problems are approached and situations responded. The identified elements describe design thinking mentality as being *experimental and explorative, ambiguity tolerant, optimistic,* and *future-oriented.*

An *experimental and explorative* mentality is seen as a key feature of design thinking (Brown, 2008). This includes a license to explore possibilities (Fraser, 2007) and a willingness to risk failure by pushing the limits of both personal and a team’s capacity, as well as the capabilities of technology and the boundaries of the organization (Holloway, 2009). Design thinkers are said to pose questions and explore constraints in creative ways that proceed in entirely new directions (Brown, 2008). The design thinking mentality is comfortable with the notion that one might be wrong, but experiments and new approaches are still undertaken (Reynolds in Guterman, 2009). Mistakes that naturally follow from exploration and experimentation are seen as a natural part of the process, with “failing fast” i.e., early tryouts, models, and prototypes seen as a preferred strategy enabling exploration with reasonable levels of risk (Brown, 2009; Zaccai in Lockwood, 2010). In addition to an acceptance of failures on an organizational level, exploration also requires personal courage (Fraser 2009).

The mentality of design thinking requires a high *tolerance for ambiguity.* In the field of design, ambiguity is accepted as a natural part of the process (Rylander, 2009) as the inquiry is rather emerging than deterministic (Cooper et al., 2009). Therefore, a key feature of the design thinkers’ mentality is being comfortable with the ambiguous (Drews, 2009), and maintaining the ability to work in the face of ambiguity. The design mentality is noted to “foster an acceptance of and a comfort with a problem-solving process that remains liquid and open, celebrating new alternatives as it strives to develop a best design solution.” (Boland & Collopy, 2004).

Design thinkers are also seen to possess an *optimistic* mentality. They assume that no matter how challenging the constraints of a given problem are, at least one potential solution is better than the existing alternatives (Reynolds in Guterman, 2009; Brown, 2008) and present an absolute unwillingness to give in to constraints and obstacles (Fraser, 2007). Design thinking is associated with enjoying problem-solving and finding opportunities in places where other people have given up (Gloppen, 2009), as well as with an appreciation for constraints, as they serve to focus scope of the work and increase its challenge (Lockwood, 2010c). Competing constraints are accepted willingly and even enthusiastically (Brown, 2009) and they are seen even to increase the challenge and excitement (Dunne & Martin, 2006).

Finally, design thinking can be described to be *future-oriented;* a common characteristic related with design thinking is the ability to anticipate and visualize new scenarios (Rusk
in Lockwood, 2010c, p. 86). Design is seen to be about improving an existing situation into a preferred one, and designers are therefore always dealing with change (Junginger, 2007). Due to this desire to create change for the better, design thinking is described as having an urge to create something new through challenging the norm (Drews, 2009). As the driving logic in design thinking is that of ‘what could be’, the starting point for work is more often a strong vision than the status quo (ibid). This future orientation is long-term, and the forces guiding the vision-driven process include intuition (Martin, 2009; Porcini, 2009), and hypotheses about the future (Martin, 2009).

CONCLUSIONS AND DISCUSSION

In order to further study the use, application, benefits and limitations of design thinking, an identification of the elements forming the concept is needed. The research presented in this paper set out to synthesize a framework for design thinking from the current management discussion. In this paper we propose a framework depicting the dimensions and related elements underlying the concept of design thinking within the management discourse. The framework builds on existing literature on design thinking, and it describes the concept as consisting of three dimensions: practices, thinking styles, and mentality. Each dimension consists of ‘elements of design thinking’ – approaches, methods, values, and concepts that continuously surfaced from existing literature. In the framework, there are several recurring themes crossing the boundaries of the three groups. For instance, ‘thinking by doing’, which entails e.g. early prototyping, is represented in the practices, but it also manifests in the mentality dimension as the explorative nature of design thinking. Similarly, the future-oriented mentality of design thinking is manifested also in the thinking styles as abductive reasoning – the continuous strive to think of “what could be”. Therefore, the elements should not be considered as separate units, but rather as forming an entity that may be called design thinking. The approach of design thinking should be seen as a bundle of certain elements that are interlinked and manifested through practices, thinking and mentality.

Considering that the experts interviewed for this research represent both discourses, the design and the management streams, it is interesting to notice that their view on what design thinking “is made of” did not differ. This leads us to ask, how do the characterizations of design thinking in the two discourses differ? A comparison of definitions would not be sensible, since, as Johansson & Woodilla (2010) point out, no unified theory of design thinking exists, but a comparison of characterizations in the two discourses may be viable. It would also be interesting for further research to identify and look into the contradictions and debates around design thinking, and to consider its relation to other discourses, such as for example creativity.

No obviously conflicting views of the elements and essence of design thinking in the managerial discourse were found. Different authors emphasized different aspects and there was variance in the elements that were stated explicitly, implicitly, or simply not included. Many of the writers within the management discourse emphasize qualities and aspects of design thinking that contrast the approaches supposedly innate to businesspeople and other persons outside the discipline of design. Therefore, a balanced holistic picture of design thinking or a designerly way of working might not be presented. Additionally, authors very seldom presented any possible drawbacks or weaknesses of adopting a designerly approach to unconventional fields. Hence, what limitations and
risks may design thinking carry, and under which conditions can or should it be implemented?
The framework presented in this paper is more suggestive than conclusive. It forms a basis for future research that aims at further developing the conceptualization of design thinking. The proposed elements of design thinking also lay foundations for the attempts to operationalize design thinking, which, when possible, would allow evaluating its use and application, as well as its benefits and limitations. The concept of design thinking as described in literature is not something that can be learned “from the books” or from abstract representations, but rather requires practicing it. Nonetheless, the proposed framework can, as such, function as guidelines for the application of design thinking into practice. However, further development of the framework and possible operationalization of the concept would definitely support a more systematic and explicitly acknowledged integration of design thinking into organizations.

REFERENCES


