Conceptions of design thinking in the management discourse

Eeva <u>Lotta</u> Marjatta Hassi, Miko Samuli Laakso

PhD candidate, Researcher, Aalto University School of Science and Technology, lotta.hassi@aalto.fi
PhD candidate, Researcher, Aalto University Design Factory
lotta.hassi@aalto.fi

Abstract

The concept of design thinking has received increasing attention during recent years – especially in management discourse. However, despite of the current hype, there is no agreed view on what is meant by design thinking. Looking into the literature related to design thinking reveals two differing discourses on design thinking: one in design, and another in management. The former discourse has its roots in the 1960's, while the latter is considerably younger. Focusing on the management discourse, this paper discusses the concept of design thinking as a set of certain practices, cognitive approaches, and mindset. These three groups consist of characteristics used to describe design thinking in management discourse. We call these characteristics the elements of design thinking, and present a framework for design thinking that draws on existing literature in management discourse.

Keywords: design thinking, design process, management

Introduction

The popular phrase of design thinking has captured an audience in managers around the world. Management magazines have covered stories about the power of design thinking, and during the lasts years, there have been several books published on the concept [3, 24, 28]. It seems fair to say that there is a considerable amount of hype surrounding the concept – which has not gone unnoticed in the academia. Johansson and Woodilla [19] specifically discuss the problematic hype, and describe how it simplifies the situation and eventually leads to a backlash. The management literature offers design thinking as a cure to nearly every challenge in business, and today, as Kimbell [22] points out, "in management practice, it seems, everyone should be a design thinker."

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" [3, p.3], or as "the next competitive advantage" [28]. 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" [30].

However, despite the hype and ample attention, there is no consensus on what is meant by design thinking. The notion of design thinking is broad [8], and the term is considered as confusing; there are debates over what exactly is meant by it, and how it differs from e.g. creativity, innovation or systems thinking [22]. What seems rather obvious though, is the 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. 8, 22].

This 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 presenting a three dimensional framework that has emerged from the current management discourse concerning design thinking. The aim of this paper is to summarize how design thinking is depicted in the current management discourse. Emphasis is given to identifying common terminology and characteristics used to describe the concept of design thinking. The paper starts by explicating the research methods utilized in the research, and then continues by discussing the two discourses in design thinking, i.e. the ones in design and management. Based on a study of relevant literature we then 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

This paper is based on a review of a selected literature and on a set of interviews with experts on design thinking. The paper does not aim to present an all-inclusive literature review, but rather focuses on some of the key texts, relevant to the aim of the research; reviewing the current management discourse on design thinking.

There were three groups of literature chosen for the review. First, there is the literature in the management discourse that is often cited or considered central pieces of the management discourse drawn from e.g. Johansson & Woodilla [18], and Kimbell [22]. Second, Design Management Institute's Review and Journal were considered relevant due to their focus on design management and the recent issue on design thinking. Third, The Journal of Business Strategy has published two special issues: 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. From the Design Management Institute's Review and Journal, as well as from the Journal of Business Strategy, the papers included in this review addressed design thinking directly, i.e. the phrase appeared in the title or the abstract. Altogether over 50 articles or books were reviewed, of which 31 were useful in addressing the characteristic elements of design thinking, and were used for building the framework. The reviewed literature contained articles describing the point of view of representatives from various

prominent organizations (e.g. HP, IBM, 3M, IDEO), and also included several articles, where the concept of design thinking was explored by interviewing practitioners and experts [e.g. 11, 6]. 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.

For this research interviews with ten experts were conducted. The aim of these interviews was to find out where the interviewees consider the origins and roots of design thinking to be and to discuss the three dimensional framework for design thinking developed during this research. The comments of the experts were used to verify the framework in terms of wordings and the grouping of elements. 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 their own understanding of what the concept entails. The interviews were semi-structured, explorative in nature and included discussions between the interviewer and interviewee. All interviews were conducted during 2010 and involved experts from The Netherlands, Finland, and the United States.

Two Discourses on Design Thinking

Searching existing literature for a definition for design thinking merely adds to the initial confusion; it appears that there are two differing streams on the concept. Johansson and Woodilla [18] 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.]

In the interviews conducted for the research presented in this paper, the experts were asked where they consider the roots of design thinking to be, where it has originated, and around what time. 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. Interestingly, the practitioners were mostly unaware of the 50 years of ongoing design discourse on design thinking. Figure 1 summarizes a few responses from the interviews, including views from interviewees representing the design discourse and the management discourse, and presents the key literature the respondents referred to.
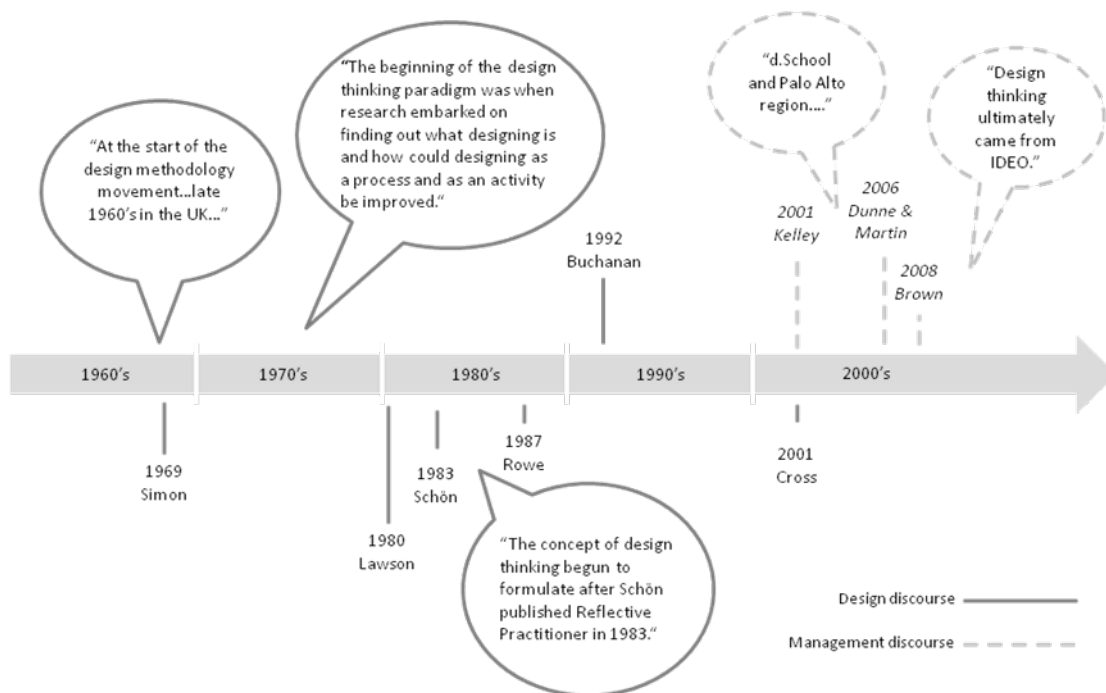
Figure 1 – Roots of design thinking: views from the two discourses. References to the key literature mentioned by the respondents.

As depicted in Figure 1, the management discourse places the roots of design thinking at the work of the design company IDEO and Stanford's d.School, with statements such as "Design thinking ultimately came from IDEO". Also the interviewees representing the design discourse acknowledge the role IDEO plays in the management discourse. However, they considered the design thinking paradigm to have begun when "research embarked on finding out what designing is and how can designing as a process and as an activity be improved". The representatives of the design discourse regularly mention Simon [37] and Schön [36] and go back to 1960's in their descriptions of the roots of design thinking: "The concept of design thinking begun to formulate after Schön published Reflective Practitioner in 1983." The interviews highlight the significant effect the management discourse has among practitioners, underlining the importance of understanding what precisely is understood by the concept.

Regardless of all the current discussion, even the most established writers on design thinking within the management discourse (the same holding true for design discourse) have not presented a comprehensive definition or conceptualization for the concept of design thinking. For example, Tim Brown, CEO of the design agency IDEO and one of the most prominent authors within the management discourse, describes it in quite abstract terms such as "a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity" [4]. Therefore, in the following chapter we, based on existing literature, synthesize the central elements of the

ongoing discussion in the management discourse, to formulate an initial conceptualization of design thinking as it is presented in the management discourse.

Elements and Characteristics of 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, cognitive approaches, and mindset. 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.

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

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 and forms a basis for the future research of the authors. 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 specific 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" [4, 31, 38]. Authors were extremely consistent in emphasizing developing empathy towards and understanding of the customer/users [4, 7, 12, 17, 20, 24, 26] and even "being in love" [31] with them. Some authors even go as far as labeling design thinking as synonymous with "customer, user or human-centered design" [35]. The use of observational and ethnographic methods [1, 4, 6, 12, 25] is seen as a key means to achieve a deep and emphatic understanding of the customer. Beyond empathizing and understanding, collaborative design with the customers [2, 4] is suggested as a viable approach.

Thinking by doing refers to the iterative and highly tangible approach favored by designers. Knowledge creation in design thinking is practical, as the process proceeds through reflection-in-action [33]. The development cycles of the iterative approach are described as systematic [35] and rapid [6, 17, 27]. Early - "from day one" [4] - and continuous prototyping [11, 13, 14, 17] 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 [24], to make concepts concrete [35], and to help the exploration of numerous possible solutions [13,14]. In essence, prototypes can be seen as a tool for stimulating thinking and exploring ideas, not as representations of the products [2].

Closely related to prototyping, **visualizing**, i.e. expressing oneself in media other than words and symbols [3] is seen as the dominant sensemaking mode of design thinking [33]. Visualization of intangible concepts, models and ideas is seen as essential [6, 11, 25], functioning as a tool aiding common understanding [38], allowing ideas to be shared and discussed [20] and revealing relationships that are not accessible in verbal presentations [35].

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 [11] without assuming that the existing alternatives, or the first ones that were thought of, include the best ones [2]. 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 [11] is seen as important. Recognizing patterns [3, 6, 35] 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. 11] is seen as a key approach. This most typically takes the form of using interdisciplinary teams [4, 3, 7, 12, 17, 27, 35]. A collaborative work style is seen as important in tackling complex

and "wicked" problems through gaining knowledge from many fields and disciplines [15], promoting diverse perspectives [12], and merging them in a meaningful and novel way [12]. Some authors also emphasize that thinking is not something done exclusively inside one's head, but is often accomplished in interaction with other people [2], using expressions such as collaborative integrative thinking [12].

Cognitive approaches

Elements categorized into the "cognitive approaches" –dimension relate to issues such as mentality, cognitive processes and thinking styles. These elements are: abductive reasoning, reflective reframing, holistic view and integrative thinking.

Abductive reasoning, or "the logic of what might be" [24], in addition to deductive and inductive reasoning is emblematic to design thinking. Whereas inductive thinking has to do with proving through observation that something works, and deductive thinking has to do with proving through reasoning from principles that something must be [24], a designer uses abductive reasoning to move from what is known to the exploration of what could be [14] - to say, "What is something completely new that would be lovely if it existed but doesn't now?" [12]. Designers use abduction to generate ideas, challenge accepted explanations, and infer possible new worlds [28, p.65]. It's a skill that plays a critical role in design thinking, and is a pre-condition for intelligent designing [10].

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 [10]. 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 [2], looking beyond the immediate boundaries of the problem to ensure the right question is being addressed [11] and going beyond what is obviously stated to see what lies behind the problem [26]. Identifying, framing, and reframing the problem to be solved are seen as equally important as solving the problem or finding an appropriate solution [1]. 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 [11].

The ability to adopt **a holistic view** - a 360° understanding [17] 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 [34]. Some authors use the term systems thinking [e.g. 14] 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 [12] and the ability of connecting external form with internal functionality or holistic vision with specific attention to detail [38].

One of the foundations of design thinking is said to be bringing competing constraints into a harmonious balance [3]. Most authors see this as being achieved through **integrative thinking**, which is about identifying salient aspects [4, 12] 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 [4, 14, 12]. Design thinking is seen to include achieving a natural balance between the technical, business, and human dimensions [4, 7, 17], balancing human-centeredness with company-centricity throughout the cycle [35], reliability with validity [28, 34], exploitation with exploration [28], and analytical thinking with intuitive thinking [28, 31, 35].

Mindset

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

An **experimental and explorative** mindset is a seen as a key feature of design thinking [4]. This includes a license to explore possibilities [13] 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 [17]. Design thinkers are said to pose questions and explore constraints in creative ways that proceed in entirely new directions [4]. 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 [3, 26]. In addition to an acceptance of failures on an organizational level, exploration also requires personal courage [14].

The mindset of design thinking requires a high **tolerance for ambiguity**. In the field of design, ambiguity is accepted as a natural part of the process [33] as the inquiry is rather emerging than deterministic [8]. Therefore a key feature of the design thinkers' mindset is being comfortable with the ambiguous [11], and maintaining the ability to work in the face of ambiguity. The design mindset 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." [2].

Design thinkers are also seen to possess an **optimistic** mindset. 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 [4] and present an absolute unwillingness to give in to constraints and obstacles [13]. Design thinking is associated with enjoying problem-solving and finding opportunities in places where other people have given up [15], as well as with an appreciation for constraints, as they serve to focus scope of the work and increase its challenge [27]. Competing constraints are accepted willingly and even enthusiastically [3] and they are seen even to increase the challenge and excitement [12].

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 [27, p. 86]. Design is seen to be about improving an existing situation into a preferred one, and designers are therefore always dealing with change [20]. 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 [11]. 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 [28, 31] and hypotheses about the future [28].

Discussion and Conclusions

The research presented in this paper set out to pave way for a more commonly shared understanding on the concept of design thinking rather than attempting to produce a decisive definition. This paper proposes 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, cognitive approaches, and mindset. Each dimension consists of 'elements of design thinking' – methods, values, and concepts that continuously surfaced from existing literature.

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 mindset dimension as the explorative nature of design thinking. Similarly, the future-oriented mindset of design thinking is manifested also in the cognitive approaches as abductive reasoning – the continuous strive to think of "what could be". The elements described above are not separate units, but rather form an entity that may be called design thinking.

During the interviews with experts, the proposed framework was presented, and the dimensions and elements were discussed. All experts agreed that the elements presented were relevant to the way they perceived design thinking. The modifications proposed by the experts dealt with the wording. However, two elements were considered to be understated: the central role of intuition as opposed to mainly analytic approaches, and the role of design in synthesizing information. 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 [18] point out, no unified theory of design thinking exists, but a comparison of characterizations in the two discourses may be viable.

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 whole 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 lays the foundation for the future research of the authors. The authors will continue to pursue a more thorough understanding of the

concept of design thinking, its roots and current discourse, possible application areas, benefits, and limitations to its use.

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