Leveling up in design

Using a game to support design maturity in organizations

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Abstract

Design is a very ambiguous term. It can be referred to as a thing, an activity, a process, and even a strategy. Because of its many meanings and definitions, it is argued that design can have more than one purpose or role. It is also argued that these roles can mature and expand within the organizational frames, which in turn can have an effect on the organizational culture and business strategy. Recent studies have shown that design-led organizations outperform other organizations in terms of stock market value and competitive advantage. As such, the topic of using design strategically, in combination with the question of how to mature in design, has become popular, both in the academic world and in the business world. In response, different models have emerged claiming to assess organizations in relation to how they utilize design. These models can evoke discussions that subsequently can lead to knowledge exchange and potentially actions toward change.

This thesis explores how organizations go about maturing in design, as well as the challenges and benefits they see within this process. Furthermore, it examines the use of a game as a boundary object to facilitate knowledge exchange and support organizations in their efforts of maturing in design. Findings include that when utilized in a workshop setting, the game facilitated discussions, knowledge exchange and knowledge appropriation related to design in the organization. Through these findings it is argued that the boundary object has the potential to support the organizations in their efforts of maturing in design.

Keywords

Design maturity, design management, strategic design, organizational change, design culture
Foreword

I have always been a firm believer that to create something creative, useful and desirable, you need to look beyond statistics and stereotypes. Humans are unpredictable, creative creatures with different experiences and interpretations, and sometimes we use things in unintended ways. Thus, I have long been an advocate for using behavioral and social sciences as a means to figure out how a user, for instance, perceives a product or service. To me, it is also clear that depending on what is found through such methods should be regarded as inputs when making strategic decisions in an organization.

In my professional career, I have worked with graphic design and communication in digital marketing, print production and web development. I have also worked as a UI/UX designer, creating wireframes and mockups for interactive media. Furthermore, I have worked as a project manager for IT, overseeing the development of new features and services, and I have also more recently worked strategically with design; developing visions, and roadmaps focused around user-centered approaches, in a smaller company.

Particularly during the later years of my career, I noticed a reoccurring issue. The reasoning and justification from management that a new product or feature would be produced or implemented was often based on rough statistics, assumptions or personal preferences. Moreover, the projects were often seen as quick-fixes or heroic efforts to try to get closer to the financial goal of the company. In turn, when I was presented with the task of translating these orders into action, I had a lot of questions. Why would we try to push a product or feature that we weren’t entirely sure would fit the needs of our target groups? Why would we copy features from websites that had nothing to do with our business? Why would we assume that just because our online customers bought a lot of a specific product one year, that that product would also be popular the year after?
In the beginning, I followed the requirements of management and helped implement the changes that they had decided upon. But when the changes didn’t work according to plan, or deadlines were pushed - management started to question the quality of the design, the usability of the feature and sometimes even the skills of the developing team. This, in turn, led to intense discussions where the developing team was not only trying to defend the project but also the team itself. Issues such as the fact that the projects were not particularly planned with regards to the company’s resources or the development process, were raised. In addition, when a feature did not work as management had planned we were forced to redesign it, while simultaneously working on the next project to not lose time. This was extremely frustrating, as we had preached the importance of testing and evaluating before launching and taking on new things. Neither were we in the financial position to hire more designers, which meant that a lot of work and responsibility fell on the shoulders of very few people.

In hindsight, and especially after writing this thesis, I can see faults in both the managerial side and with the developing team. The main problem was probably that we did not speak the same language. When I got assigned a new project the specifications or requirements from management were either next to non-existent or extremely vague. They had a vision that they wanted to realize but had no idea how it would be done - so they guessed based on whatever insights they had. Leaving the development team frustrated or confused. And when we tried to explain the importance of user research, and creating and testing prototypes we were not always fully aware of the financial aspects related to that process. Time is money, and sometimes you just need to be the first one on the market with a specific feature to keep a competitive advantage. Moreover, we did not have enough design representatives in all of the levels and areas throughout the organization, and so design methods and processes were not established as something valuable. Rather it was seen as something that took time away from developing new features. This also made the ones passionate about design, to be perceived as annoying “preachers”, always complaining about the way we worked. As a designer, I was supposed to do
my job of visualizing and developing the visions and requirements from management. Instead, I questioned them, arguing that the projects were not enough thought through or based on enough information, which was not always well received. Emphasizing research before action could just as well have been translated into prioritizing the user before the company.

I eventually quit my job as a designer for that company and instead sought after more knowledge in how to work with design, which I found here in the Master’s program of Strategic Media Development. My goal for this education has been to develop my skills in design processes and design methods even more, as well as identify why things didn’t work out so well at my previous job and how situations could have been approached differently. This has led me here, to this thesis where I have tried to present my new-found knowledge for how design can be used in an organization to create better things, better processes, and better strategies. I hope you will find my findings both interesting and useful, whether you are an aspiring designer or a CEO looking to invest in a more user-centered approach.

Acknowledgments

Before diving into the world of design, I would like to acknowledge some people who have made this project possible. First, I would like to thank my supervisor, Suzan Boztepe, for her invaluable support, and for opening my eyes to the world of strategic design. Secondly, I would like to thank my family as well as my partner in crime, Albin Eneroth, for believing in me and for helping me pursue my goals. I would also like to thank the participants from Jayway by Devoteam, ID Kommunikation, Visma and Arduino, for their time and effort in this study. And finally, I would like to thank my wonderful classmates. Without your inclusive, crazy and fantastic energy, this would have been extremely difficult to accomplish. I will miss you all, greatly.
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1. Introduction

Design is no longer only concerned with giving form to products. Rather, design is now known also for becoming more integrated into business management tasks and strategic-level work (Buchanan, 2015, 2016; Junginger; 2016; Michlewski, 2015; Yee, et al., 2017). However, the idea of using design to influence business strategy is not a novelty. Ever since the mid twentieth century, design has been argued to have a positive effect on business strategy (Buchanan, 2015; Boztepe, 2016). In the 1960’s, Nobel Prize winner Herbert A Simon identified design as a key feature of management, arguing that anyone who devices courses of action aimed at changing existing situations into preferred ones, are designing (Simon, 1996). As business strategy is concerned with planning ahead and ultimately moving from one state to another (Buchanan, 2016; Simon, 1996), arguably strategizing is designing (Simon, 1996; Heskett, 2005; 2017).

Design and business strategy have always been dependent on each other (Buchanan, 2001), and the evolution of design in organizations has become a topic of interest for many scholars and organizations alike. Up until the early 1960’s, professional designers were mostly concerned with aesthetics and form giving practices, but the ambition to use design methods to improve processes, business strategies and business models was considered an important focus for designers as well (Buchanan, 2016). However, because of the strong focus of using quantitative measurements as the core decision-making driver in business management education, design and its mixed methodologies was undermined in this area (Buchanan, 2016). To uncover what the customers wanted and needed, management often relied on a tayloristic approach, which emphasized efficiency, performance monitoring, as well as science, statistics and numeric data as decision-making drivers (Taylor, 1911; Uddin & Hossain, 2015). Designers, on the other hand, assume human experience, desire and emotion as its decision-making driver (Liedtka, 2010). Subsequently, this led to a lack of product understanding from
management, as well as a knowledge gap between strategists and designers which, to this day, has proven to be difficult to bridge (Buchanan, 2015; 2016; Liedtka, 2010).

However, over the past decade, the attitude towards design and its emphasis on qualitative drivers has begun to shift as its documented benefits have begun to surface (Buchanan, 2015; 2016; Michlewski, 2015). Some of these benefits include an increased return of investment, improved stock value position and competitive advantage (Wescott et al, 2013, Acklin, 2013), increased customer loyalty and satisfaction, opportunities to create more disruptive innovations and sustainable solutions (Brown, 2009; Yee, et al., 2017), as well as improved working conditions within the organization (Buchanan, 2016; 2015; Yee, et al., 2017). While organizations today are starting to shift more towards this new design attitude, using design strategically is still not regarded as a common practice (Buchanan, 2015; Michlewski, 2015). Furthermore, only focusing on implementing design on a high strategic level is not necessarily enough to become a design-led organization. Some argue that design must be represented in all levels of the organization for it to truly become design-led (Liedtka, 2010; Buchanan, 1992; 2001; 2015; Yee et al., 2017). In these aspects, it is thus of importance that actors from all organizational levels have a common and clear understanding about what the efforts entail when shifting focus in an organization (Kotter, 1996; Eppler & Platts, 2009), as well as why design is important to invest in (Yee et al., 2017). This common understanding is a challenge, as design knowledge and design practices are not widely nor uniformly understood and agreed upon subjects (Cross, 2001; Lawson, 2006; Liedtka, 2010). For example, social, cultural, environmental, and educational differences can occur in terms of work processes; what is understood to work for certain team members, might not work for others. Moreover, while the ambition to invest more in design can be strong, some companies find it difficult to know which areas they should prioritize and focus on (Yee, et al., 2017), as well as how to fully utilize their resources to become more design focused (Acklin, 2013; Liedtka, 2010; Buchanan, 2015).
In order to show the impact of design, as well as where design creates value in organizations, frameworks, and assessment models have been created by both scholars (Buchanan, 1992; 2001; Borja de Mozota, 2006; Junginger, 2009; Heskett, 2005) and organizations (Design Management Institute, 2015; Danish Design Centre, 2015; Artefact, 2015). The interpretation of these models and the results they claim to offer are, however, subjective as they may vary depending on who uses them (Braga, 2017). For example, a manager might give design a higher overall or area-specific score, while a designer might identify the level of design as much lower. As such, the issue of a common understanding of what design offer is still not entirely solved by using these models and frameworks.

To create a uniform understanding of design in an organization, this thesis suggests that evaluating the use of design should be a social, group activity in a workshop environment, where knowledge, insights and opinions can be shared and addressed. In order to generate knowledge in a workshop environment, Keitsch (2015) suggests the use of a *boundary object*. Boundary objects are described as artefacts (maps, documents, forms, set of rules, or concepts) that link different interests, and allow people to collaborate on a common task without necessarily reach consensus (Star, 2010; Kimble et al, 2010; Davies & Flynn, 2015; Keitsch, 2015). Board games and card games have been classified in various research as boundary objects in the sense that they incorporate a concept, a set of rules, a storyline or script, learning objectives, etc. (Brandt, 2006; Valente & Marchetti, 2015; Davies & Flynn, 2015). As such, making a board game-like artefact that assesses the design maturity level of organizations, and use it in a social context like a workshop, would arguably generate knowledge about design and support the organization in its design maturity process. In addition, this thesis suggests ways for a company to increase their level of design maturity. In the literature review it lists and elaborates on two main aspects to consider when striving to mature in design; design representatives and design knowledge. In
comparison to the findings of the study, these aspects are further elaborated on in the discussion section. Furthermore, the list expands and suggests more aspects on how organizations can mature in design.

While research about design’s supposed strategic impact is a relatively under-researched topic (Boztepe, 2016; 2018) this thesis still offers an overview of the benefits of design across organizational areas. Furthermore it provides a foundation for future research of how organizations can mature in design, using boundary objects as facilitators.

1.1 Purpose of the study

The purpose of this study is to provide an understanding of the expansion of design in organizations as well as the benefits and challenges of this process. The findings of this study contribute to both the research community and the business world in terms of exploring ways for businesses to mature in design. Furthermore, the study aims to support organizations in their efforts of maturing, through the use of a boundary object. This concept contributes to an under-explored area of research in the field of design maturity, and provides a foundation for future work.

1.2 Research question

The research question for this thesis is two-fold, and touches upon two different aspects to this thesis. The first aspect addresses the concept of design maturity in general. It aims to identify the means necessary to mature, as well as the issues and challenges related to this process. The second aspect regards the use of a physical game as a boundary objects to facilitate the process of maturing in design. In order to further narrow the research questions, sub-questions are added to guide the researcher in the researching process. The research questions are designed as followed:
RQ1: How do organizations mature in design?

- What are the benefits of maturing in design?
- What efforts are needed in order for organizations to mature?
- What are the challenges and issues related to the process of maturing?

RQ2: How can a game be designed and used to support organizations in their efforts to mature in design?

1.3 Overview of the thesis

The thesis will start with a literature review that aims to provide a foundation for the study to build on (see Figure 1). After the literature review the thesis explains the methodology of the study, which is based on an inductive approach aimed to uncover meaning through interpretation and design focused research methods. The study adopts the double diamond structure, which is consistent throughout the study. The methodology section also includes participant sampling, data collection and analysis approaches. The next chapter concerns the results of the study, and is divided into three sections: The interviews, the prototype and the workshop. The findings from the first sections, in combination with the findings from the literature review, provide the design requirements for the prototype. The development of the prototype is further discussed in the second section of the results (The prototype), and the tests are then presented in the third and final section (The workshop). The results are then reflected upon in regards to the literature findings in the fifth chapter - Discussion. Here, the study also proposes key aspects for an organization to consider, in order to mature in design. It also leave suggestions for future work and discusses the limitations of the study.
2. Literature review

The literature review begins with a chapter that aims to define design. This is done by exploring the words literal, academic and professional definitions, as well as by exploring how design has been used throughout history. In the next chapter, the concept of design knowledge is addressed which include a section on the differences between designers and strategists in terms of education and personalities, as well as a section on the methodology of design thinking. Continuing with the professional use of design, the literature review then explores design’s expanding role in organizations, where the concept of strategic design is explored. This chapter also includes case studies in which design has played an important role in changing the organization in terms of strategy and culture. The last chapter in the literature review addresses the concept of design maturity, with a focus on models designed to measure the impact and value of design in organizations. Different models are presented as well as the concept of boundary objects, and how they can facilitate design maturity in organizations.

2.1 What is design?

In order to deeper explore the use of design, let us first attempt to define it. According to Heskett (2005) design is something that affects everyone in every aspect of human daily life. In agreement, Caplan (2005,
p.6) states “Design is not everything, but it somehow gets into everything”. While vague as definitions, these reflections suggest the complexity and ambiguity of design. Because design is connected to most things we interact with or do in our daily lives; the clothes we wear, the food we eat, the furniture we use; how we decorate our houses or apartments, the way we organize our desks and computers at work, plan and structure our days, and strategize for our future (Friedman, 2000; Heskett, 2005; Caplan, 2005; Simon, 1996; Schön, 1992; Lawson, 2006).

The word design is both a verb and a noun. When using the word as a verb, it means: “to connect things”, “to create or simulate”, or “to plan, draft, sketch or shape” (Flusser & Cullars, 1995). It refers to the activity, or set of activities (process), of making something (Heskett, 2005, Cross, 2001, Friedman, 2000; Michlewski, 2015). As a noun the word has synonyms such as “a purpose” or “a plan”, or “an intention, goal, plot or form” (Flusser & Cullars, 1995; Friedman, 2000). While grammatically odd, it is technically possible to say “I will design a design to design a design”, since the word possesses these different meanings (Heskett, 2005). A more grammatically correct and understandable sentence would for example be “I will devise a plan to create a product”. It thus seems like the definition of design is quite dependent on context; how, by whom, and in what situations the word is used.

Because of its literary definitions, design is often defined as an action-based process (Friedman, 2000; Simon, 1996; Michlewski, 2016). Along these lines, it can be seen as an ability to connect, plan and make things that serve purposes of human beings (Buchanan, 2001). Arguably then, design can be both an activity centered around creating a product, a service or a system, as well as a cognitive and reflective practice, like a plan or a thought (Schön, 1992; Cross, 2001; Lawson, 2006). It is argued that by exploring the activities related to design, clarification about what design really is can be established (Heskett, 2005). In the following section this approach will be adopted, by looking at how design has been used throughout history.
2.1.1 Design through history

To explore the history of design practice would be to trace it back almost two and a half million years, to when the *homo habilis* created the first tools (Friedman, 2000). Design as a profession, on the other hand, is not that old. The craft practice slowly evolved into its own discipline after the industrial revolution and first entered the university curriculums as art programmes, in the 1920-1930’s (Friedman, 2000; Margolin, 2010). Design programmes were then fostered in places like architecture schools and technology colleges (Friedman, 2000), and after World War II universities started to consider offering master degree education in design (Margolin, 2010). The introduction of design in higher education also established the field as a professional practice, rather than simply a craft or trade (Friedman, 2000).

Up until the early 1960’s, professional designers were mostly concerned with aesthetics and form giving practices (Buchanan, 2016). While designers played an important role in developing products in business and industry, they still acted outside the central processes of business decision making and management (Buchanan, 2016). The ambition to bring the understanding of design into the management and decision-making context was strong. During those years, management fields as a whole adopted more quantitative and structured processes, based on a tayloristic approach (Taylor, 1911; Buchanan, 2016; Uddin & Hossain, 2015). The emphasis on efficiency through performance monitoring, as well as science supporting decisions that is prominent in taylorism, was transferred into management education (Uddin & Hossain, 2015). Infusing a wider understanding of design in the management context was further challenged with the emergence of business consultancy firms, as they additionally promoted the use of analytics, and the importance of objectivity, rationality and proof of concept, as the central driver for strategic decision-making (Buchanan, 2016; Liedtka, 2010). In turn, among managers, this led to a less user-centered focus and understanding about the actual products and services that the company offered.
(Buchanan, 2016). As new MBA (Master of Business Administration) students were educated with a focus on the new analytical tools, design and management drifted apart in terms of education and understanding about the qualitative methods, that arguably can contribute to more desirable products (Brown, 2009) and subsequently lead to an increased return of investment (ROI) (Buchanan, 2016). This knowledge gap between designers and managers, has since been difficult to bridge (Buchanan, 2015; 2016; Liedtka, 2010).

As a response to this dilemma, design representatives made efforts to make design more like a science, and design methodologies started to appear. The Conference on Design Methods, held in London in 1962, marks the start of design methodology as a subject of field of inquiry (Cross, 2001). The design movement then was concerned with the act to scientize design - to produce works of art and design based on objectivity and rationality (Cross, 2001, Archer, 1981). This methodology became known as Design Science and was introduced as an innovative method in technology development by people such as Buckminster Fuller (Cross, 2001; Szczepanska, 2017). Fuller, both a technologist and teacher at MIT’s Creative Engineering Laboratory, created systematic methods to evaluate, design and solve problems, and used teams of experts in diverse fields of study; such as sociology, natural science, technology and design, to solve complex problems (Szczepanska, 2017). The idea of creating a diverse group of participants for problem solving became the foundation for Participatory Design. This methodology began to emerge in the 1970s in Scandinavia, and was motivated by the idea to empower workers and foster democracy in workplaces (Ehn, 2008; Spinuzzi, 2005; Gregory, 2003). In contrast to Fuller’s expert teams, participatory design invited people to design products and process regardless of their experiences in design or expertise in specific fields (Spinuzzi, 2005; Szczepanska, 2017; Ehn, 2008). The methodology emphasizes the importance of co-creation and “knowledge by doing”, and includes a wide variety of methods such as:
“mock-up envisionment”, future workshops, organizational games, co-operative prototyping, ethnographic field research, and democratic dialogue (Ehn, 2008; Gregory, 2003).

During the 1970’s design theory became more and more intertwined with social studies and sustainability - much so by the efforts of people like Victor Papanek (Szczepanska, 2017). Being critical of consumerism and its fundamental impact on the environment, Papanek offered an anthropological element to design processes, in order to purposely design more socially and ecologically sustainable products, services and processes (Papanek, 1985). Parallel to Papanek’s endeavours to create sustainable processes that solved social, cultural and environmental problems, the term “wicked problems” was coined by Horst Rittel and Melvin M. Webber (Szczepanska, 2017). Wicked problems are problems, that cannot be solved easily, because they are ill-defined, are multi-dependent, socially complex and might involve changing human behavior, or demands setting boundaries and responsibilities aside to be solved (Rittel & Webber, 1973; Buchanan, 2008; Coyne, 2005; Sherman, 2016). The term became absorbed into the design field as Rittel and Webber argued for the flexible methods used in design research, and their ability to better adjust to unpredictable and changing environments and social dilemmas (Rittel & Webber, 1973).

The 1980’s offered more in depth exploratory research into the cognitive abilities of designers and how design processes work. Among the most prominent researchers were Nigel Cross and Donald Schön, who observed designers in their collaborative as well as solitary work. Schön (1983; 1992) in particular, emphasizes design as a reflective practice, and relates it to other notions such as “reflection-in-action” or “knowing-in-action”. What Schön means by design as a reflective practice is the practitioner’s ability to reflect and reframe their work as they are working with it, to gain more and more appreciation for it (Schön, 1983). As such, it suggests that designers not just create things in a linear manner, from start to finish, but that they iterate their work as they go along, to continuously optimize the
things they create. Cross’s (2001) research showed that designers think in different, more creative ways. These ways would in later years be conceptualized as, for example, brainstorming, that people from other professions could emulate (Kimbell, 2009; Szczepanska, 2017).

In the 1990’s the methodology Design Thinking was created. Known to embody an iterative, user-centered approach, that aims to provide insight into human needs (Brown, 2009; Dam & Siang, 2019a) it is argued to be a useful methodology for businesses to use, in order to increase the quality, desirability and value of their products and services (Buchanan, 2016). The methodology borrows methods from a variety of disciplines (including, but not limited to, ethnography, computer science, psychology and organizational learning) and is considered vital to user experience design (Dam & Siang, 2019a). In 1992, Buchanan emphasized the potential of the methodology when tackling wicked problems. This concept was promoted by IDEO, a design firm that became known to turn different kinds of businesses and organizations (both in the private and public sector) into more profitable ones, using design thinking (Brown, 2009; Michlewski, 2015; Szczepanska, 2017).

IDEO’s success stories were promoted in business publications such as Business Week (Nussbaum, 2004), Harvard Business Review and Forbes, as an effective tool to create user-centric organizational cultures (Kolko, 2015), as well as innovative and empathic solutions to customers (Turnali, 2017). User-centered design has since then become a topic of interest for companies. Today, it is not only used for improving existing or designing new products and services, but also for designing systems, processes, entertainment, communication, and other kinds of human-centered activities (Muratovski, 2015). It is argued to act as a catalyst for change in organizations, which in turn not only changes products, systems and processes, but also organizational strategies and cultures (Brown, 2009; Muratovski, 2015; Yee et al, 2017).
2.1.2 The expansion of design

Before diving deeper into how design is used to change organizations, let us first try to define the different states that design can exist in. Buchanan (2001) suggests that there are four broad areas of design. These areas are not necessarily fixed categories for design practices, but rather “places” in which design practices can be discovered and fostered (Buchanan, 2001). These are useful when analyzing design processes (Nylén, Holmström & Lyytinen, 2014) as well as when aspiring to organize an ever-growing and complex field such as design (Gajendar, 2008).

Buchanan’s first and second area of design are concerned with the professions of graphic and industrial design (1992). Graphic design grew out of an appreciation for symbols and communication through words and images. It is usually associated with typography and marketing, printing production, and art and illustration. However, the area has also expanded into the realm of communication through mediums such as photography, film and television, and online, digital media (Buchanan, 1992). Industrial design grew out of a concern for physical and tangible artifacts. This includes the form and visual appearance of everyday products, such as clothing, domestic objects, tools and instruments, machinery and vehicles. However, here Buchanan (1992) explains that this area too has expanded into a more thorough and diverse interpretation - focusing not only on the physical but also the psychological, social and cultural relationships between objects and human beings. Buchanan (2001) further argues that:

“It is certainly important that designers know how to create visual symbols for communication and how to construct physical artifacts, but unless these become part of the living experience of human beings, sustaining them in the performance of their own actions and experiences, visual symbols and things have no value or significant meaning. Therefore, we should consciously consider the possibility that our communications and constructions are, in some sense, forms of action.” (pp. 11)
Buchanan continues to explain that out of this concern grew the domain of interaction design - the study of how human beings relate to products, experiences, activities or services - which has evolved to become a strong and important discipline in both academic settings and business contexts. With the emergence of interaction design, designers turned to *action and environment*, which make up the third and fourth order of design (Buchanan, 2001).

The third area of design relates to the traditional logistics management activities and processes, combining physical resources, tools, and human beings in efficient “sequences and schedules” to reach very specific goals (Buchanan, 1992). Again, similar to the previous areas, Buchanan (1992) explains that this area has expanded into a concern for logical decision making and strategic planning, which includes looking at how the methodology of design thinking can contribute to create a more user-centered culture and innovative and creative problem solving processes.

The fourth and final area is the design of *complex systems or environments of living, working, playing and learning*. Included in this area are traditional concerns of systems engineering, architecture, and urban planning. However, the area has over time become more concerned with environments and sustainable development.

Buchanan’s four orders of design do not only show what design can be used for but also how design has evolved throughout history. Through his work, it is therefore safe to say that design is not only concerned with giving form to products. Rather it is used to create more user-centered, desirable and sustainable products, processes, strategies and cultures. Versions of the four orders of design also appears within models that aims to define the role of a designer within an organization. One of these models, developed by Heskett (2017), shows how designers can work with design at different areas in a company (see Figure 2).
The vertical axis in Heskett’s model represents the degree of innovation regarding the organization’s products. At the very bottom, the focus is high on existing products, while at the top, there is a concern for innovation and the creation of new concepts. The horizontal axis represents the organization’s different strategic levels in regards to design. At the left, the organization works mostly with design in product-level strategies, while at the far right, the organization works with design in corporate-wide strategies.

In the bottom left corner of the model, design is used as an *interpreter* (Heskett, 2017). Designers here are typically engaged in aesthetics and superficial improvements of an existing product. This is the
case for Original Equipment Manufacturing (OEM) companies, in which manufacturers are provided with specifications for products to produce. Designers and manufacturers are not typically required to engage in innovation of new products. Instead they are required to add value in limited terms (Heskett, 2017). In the top left corner, design is used as a differentiator. At this level, designers focus on innovation of - and the differentiation between - products in order to create a distinctive market position as is seen in Original Design Manufacturing (ODM) companies (Heskett, 2017). In the bottom right corner, design is used as a system creator. Here, designers have a more managerial role, and work with connecting the overall output of a company which is typical of “Original Brand Management” (OBM) companies, as Heskett calls them. Finally, in the top right corner of the model, we have design as planner, or “Original Strategy Management” (OSM). Here, designers get involved in the creation of innovative plans and visions for the entire organization; design is used to set a direction for the organization, as well as create innovative strategies that will ensure the company’s competitive position and create an advantage in the market (Heskett, 2017).

Much like Buchanan’s four orders show how design has evolved through time, Heskett’s framework shows how the use of design can evolve in an organization. It also shows the role of the designer, which indicate that the knowledge of design also changes - not only with time and through new technology and university curricula, but also within the organization itself.

2.2 Design knowledge

Design knowledge is claimed to be different from other ways of knowing (Cross, 2001). It is a multidisciplinary field that not only requires practical skills and knowledge of methods, but also knowledge of other disciplines and scientific fields (Friedman, 2000, Archer, 1981; Lawson, 2006; Stolterman, 1994; Hoadley & Cox, 2009). According to Cross (2001) design knowledge is about “...the
Buchanan (2016) argues that design is about finding value and meaning in products. The discipline is therefore very wide, considering all the artificial things that exist, and how human beings relate to them. It does not just cover the physical, scientific or technological aspects of the artificial, but also social, psychological and environmental aspects (Schön, 1992). A person can analytically study and learn about art or design for years, but without the synthetic aspect of how design relates to everything else, it lacks meaningful value. Designers therefore need to be “knowledge-chameleons” - knowing a bit of everything to be able to adjust to any given problem, and create solutions to many different kinds of people.

As the world is ever-changing, it is also important for designers to be flexible and open to change. This, however, is not a concept that is easy for non-designers or scientists to adhere to. The goal of the natural scientist is to explain how things are, whether it be laws of physics or consumer behavior. Design on the other hand is concerned with how things ought to be (Simon, 1996; Cross, 2001; Buchanan, 2001), which means that it needs to focus on the unexplored and the uncertain (Liedtka, 2010). Design knowledge offers tools and methods for exploring these uncertainties more in depth, rather than hypothesize about them. This, in turn, is a strong argument to why design should have more mandate when dealing with strategic work in businesses. Organizations need to change in order to survive (Junginger 2006; 2008), and it is argued that designers have the skill set and knowledge to navigate through that change (Liedtka, 2010, Michlewski, 2015).

In her article, “Business Strategy and Design: Can this Marriage Be Saved?”, Liedtka (2010) highlights the differences between designers and business strategists, playing with the metaphor that designers are from Venus and business strategists are from Mars. Similar to the differentiation between natural sciences and design, she presents that business strategists value stability, control and predictability, while designers are concerned with the ambiguity and uncertainty of the behaviors or
human beings. Business strategists prefer clean, economic logic and analytical processes, and are annoyed with designers’ passion for iteration and experimentation. Rather than favoring prototypes and models as tools to test and showcase value, business strategists prefer powerpoints and spreadsheets showing probability calculations of return of investments (ROIs). Designers assume human experience, desire and emotion as their decision making driver, while business strategists prefer a more objective approach consisting of theory and reason as the motivation for making decisions (Liedtka, 2010). However, arguably design is every bit as data driven as traditional management approaches, only that designers use a different kind of data (Liedtka, 2010). Statistics only tell us parts of the truth, and so it is argued that management need to allow designers and their methods to be part of decision-making processes, in order to make sense of the analytical data (Liedtka, 2010; Michlewski, 2015).

The different personalities of designers and managers are important to highlight, as they tie together with how the different actors communicate and share knowledge with each other. According to Eppler (2007) communicating professional knowledge is a key activity in organizations, adding:

“...the transfer of experiences, insights and know-how among experts and decision makers is essential for high-quality decision making, as well as coordinated, organizational action” (p. 1).

What is suggested by scholars, however, is that designers and managers speak different languages (Cross, 2011; Liedtka, 2010; Michlewski, 2015). Thus, this knowledge-exchange is difficult to enable. The diversity in educational backgrounds and university curriculums are partially to blame (Buchanan, 2016; Michlewski, 2015), however, arguably so are the actors’ individual characteristics. Designers often cultivate an ‘ego’, that is centered around their knowledge and expertise (Borja de Mozota, 2003). However, they simultaneously lack the confidence and communication skills to convey this knowledge in a way that makes it understandable and valuable to managers (Borja de Mozota, 2003; Michlewski, 2015). Borja de Mozota (2003) argues that the poor communication of design methodologies by designers
creates a unclear working environment, which is one of the reasons why managers have difficulties embracing design as a strategic tool. Similar to Liedtka’s assessment of managers (2010), Borja de Mozota (2003) state: “Managers need strong reference marks, reliable information and assurance that they will be able to finance design with security.” (p. 66).

The suggestion to train managers (or non-designers) in design knowledge may seem like a logical suggestion. However, paradoxically, designers see a potential problem with doing so as it is assumed that it could undermine their education. In response to this, Liedtka and Ogilvie (2011) suggests that the focus should instead be on emphasizing the use of the methodology of design thinking and the ways in which it can contribute to make strategies and visions, as well as the value of design, more tangible and understandable, rather than focusing on teaching design knowledge in general.

2.2.1 Design thinking

Design thinking is centered around five stages: empathize, define, ideate, prototype and test (Brown, 2009; Dam & Siang, 2019b). It is a convergent and divergent process, with a focus on iteration and experimentation. The first stage, empathize, focuses on gaining an empathetic understanding for the users and a deeper understanding for the problem that is trying to be solved (Brown, 2008; Dam & Siang, 2019a). This is done by gathering information and insights from potential customers or users using qualitative research methods, such as interviews and observations - sometimes through immersive ethnographic studies (Dam & Siang, 2019a). It is important to gather information about the needs, issues and challenges that users face, in order to move on to the second, convergent stage of the process, which aims to define the core problem based on the previously gathered information.

The third stage in the process is to ideate. Based on the problem definitions, judgement free, “out of the box” idea-generation, where any idea is considered a possible solution, is performed (Brown, 2009;
Dam & Siang, 2019a). This activity is often based on methods of brainstorming and visual thinking in combination with using post it-notes (Brown, 2009). Brainstorming is, however, not the only certified way to create innovative and diverse ideas and solutions to problems. In the late 1990’s, Smith (1998) identified 172 different idea-generation techniques, and with today’s technology there are arguably more, electronic ways to engage in an ideation processes (Miller, Jones & Bailey, 2009; Furnham, 2000; Scardamalia & Bereiter, 2003). Neither is brainstorming considered the most effective tool in all situations (Bouchard, 1972; Brown, 2009; Kumar, 2013). Brown (2009) suggests that the attitude and motivation towards the activity affects the efficiency of the activity, by stating:

“...a well-intentioned manager who assembles a group of individuals who don’t know one another, who are sceptical, and who lack confidence, and give them a tough problem to brainstorm, is likely to get fewer viable ideas than if each of them had been sent away to think about the problem individually” (p. 78)

In this statement, Brown hints to the activity of individual problem-solving as an alternative to brainstorming, which, by some, is considered a superior method (Buchard, 1972, Furnham, 2000). Studies show that the quality of the generated ideas during a brainstorming session, is questionable in comparison to individually generated ideas (Buchard, 1972, Furnham, 2000; Rowatt et al, 1997). Also, as Brown suggests in his statement, brainstorming does not necessarily produce a bigger quantity of solutions either. Still, the brainstorming method has its justifications set in two main arguments (Buchard, 1972): first, if many different problems needs to be solved, the solution may reside in many different people. As such, the wider the diversity of the group, the more likely it is to find a solution. Individual problem-solving does not offer diversity. Secondly, the acceptance of a decision by the participants in a brainstorming session is often as important as the quality of the decision. In individual problem-solving, this is necessarily not a problem, as you often accept your own ideas. However, what is then lacking is the instant assessment from other people, and their uniform acceptance to this idea. Furthermore, Kumar
(2013) highlights the difficulties of deciding on which of the ideas to go forth with. He explains that the decision-making process has a tendency to be influenced by personal preferences, experiences and other biased and subjective standpoints. Liedtka and Ogilvie (2011) adds to the list of reasons why brainstorming can be problematic as the idea-generation method, stating that there is an experienced lack of follow-up activities after brainstorming, and the support from the organization itself seems to fade after a decision has been made. Again, this may be a reason not to pursue the use of brainstorming. However, as suggested by Brown (2009), this stage is not necessarily the place for making finite decisions. Rather it is suggested that the ideas are tested and solutions experimented with, in order to then decide which idea or solution to go with. This can be done by making simple, low-fidelity prototypes - physical, digital or conceptual representations of the ideas and solutions (Dam & Siang, 2019a).

Prototypes evoke discussion and reflection, which can be used to test a theory (Stappers, 2013). Early prototypes should be fast, rough and cheap, because the greater the investment, the greater the commitment (Brown, 2009). If it turns out that the prototype did not work, the time and effort to create it becomes less of a factor. Another word for these early, rough prototypes is “low-fidelity” prototypes. They should be sketched or built with minimum effort in order to test an idea or prove a solution viable for further development (Dan & Siang, 2018). As such, this fourth step is another diverging stage of experimentation. According to Brown (2009) prototypes should only take as much time, effort and investment that is necessary to drive an idea forward. He argues that the goal of a prototype is not to create a working model. Rather, it is a relatively riskless way of giving form to an idea, learn about its strengths and weaknesses, and identify new directions needed for future development of more high-fidelity prototypes. However, it is not fair to assume that everyone who is presented with a prototype will understand that it is a prototype or have the same view of it as everyone else (Buchenau & Suri, 2000). It is therefore of importance to consider the prototype’s use based on more than just usability. It
should also consider cultural, social, psychological and environmental conditions (Buchenau & Suri, 2000). Schön’s (1992) view of design as a reflective practice is fitting in regards to this and the forthcoming stage, as reframing and reflecting on the prototype can lead to further refinement of it.

The last step of the process is to test the prototype. Depending on the form and concept of the prototype, testing can be done in many different ways. Testing may allow for new customer groups to surface, and for new ways of using the product to be uncovered. Dam and Siang (2019) suggest that it is important to test the prototype on the right people, since the relevance of the given feedback is depending on whom the prototype is tested on. They suggest that the prototype should be initially tested on the extreme users - the users who would use the hypothetical finished product - adding:

“Testing your prototypes on extreme users will often help you uncover some problems and relevant issues that affect regular users, because the extreme users tend to be more vocal about their love (or dislike) of doing things related to your prototype.”

Furthermore, if the product is going to be used in different geographical areas, it should be tested by people in those places. Differences in cultures and customs might be relevant to how the finished product will be presented (Dam & Siang, 2019b; Buchenau & Suri, 2000). Moreover, testing the product in-house with internal stakeholders will also improve the understanding of the product, as well as the distribution of it (Dam & Siang, 2019b). If it turns out that the product will be difficult to sell or ship, it might be appropriate to find solutions to those issues before launching.

By using the methodology of design thinking, it is argued that organizations can create more innovative and sustainable solutions and products, as well as processes and strategies (Brown, 2009). Applying design thinking to define problems and challenges within the organization, and create new and improved processes, business strategies, and even cultures, can facilitate a more human-centered work environment, more relatable and useful products, and an improved competitive position in the market.
Brown (2009; Acklin, 2013; Buchanan, 2016; Yee et al., 2017). However, historically the methods and processes of design thinking have been misinterpreted, which, in turn, has led to a widespread misunderstanding and misuse of the methodology and its potential benefits (Hernández-Ramírez, 2018; Buchanan, 2016). It is therefore argued that designers who are familiar with the methodology and possess knowledge about design methods, should teach this methodology to non-designers (Liedtka & Ogilvie, 2011).

2.2.2 Design used for strategy

In an article for FastCompany.com, Brown (2005) offers his definitions of strategy, and why design is necessary to communicate it. He starts by providing a rather general, yet comprehensive view of the term:

“Strategy should bring clarity to an organization; it should be a signpost for showing people where you, as their leader, are taking them—and what they need to do to get there.”

Brown continues by stating that strategy often can be difficult to communicate using the tools that executives traditionally use. Word-heavy powerpoints, spreadsheets with graphs, or motivational speeches are not necessarily the most effective ways to communicate strategy. A lot of information gets lost in translation; words can be very open for interpretation and graphs depicting the future of the company can sometimes be misleading (Brown, 2005). People have a visceral understanding of information (Norman, 2004; Brown, 2005). Thus, it seems appropriate to, through the means of visual and engaging media, showcase why a certain strategy has been chosen, and what is planned to come out of it (Brown, 2005). Brown argues that design is ideally suited for this task, as it helps to create tangible, real outcomes.

Brown’s arguments are supported by Holloway (2009) who argues for the use of prototypes to present strategy in a tangible, engaging and understandable way. By using the animation features, motion
paths, and transition features in PowerPoint to capture the customer and partner experiences, a team of designers constructed a narrative that showed the underlying decisions for expanding the online strategy of the company SAP. According to Holloway (2009), the final prototype demonstrated tangibly 1) how Web 2.0 could be leveraged for enterprise solutions, 2) competitive differentiators and explicit value propositions, 3) a series of familiar and relatable business scenarios, ranging from the activities of changing a component supplier to developing a comprehensive market strategy, to resource allocation and organizational planning. The scenarios were developed based on a needs analysis with the company’s customers. Holloway (2009) further states:

“Going into the meeting, all of the executives had intellectually understood the principles and technology behind Web 2.0, as well as its importance to enterprise software. But it was not until they experienced the prototype that they understood what it would truly mean to the company, customers, and indeed to the industry to incorporate Web 2.0 into our strategy. After that meeting, the executive board altered the company strategy, and using the prototype as the basis for communication and assessment, they began to incorporate its tenets into the company’s portfolio planning process.” (p. 54)

Kotter (1996) stresses the importance to clarify the steps necessary to move an organization closer to its goals and visions, and Holloway’s case study offers a concrete example of how this can be done effectively using design thinking and the competencies of designers. But there are more ways in which design can drive strategic change.

In the book “Transformations: 7 roles to drive change through design”, Yee, et al. (2017) present examples of organizations that have utilized design in different ways to improve their products, processes and strategies. In the list of companies Spotify, Telstra, and SAP are found - all in which design has been a key factor to their success. Based on these cases, two main aspects can be identified that made the organizations become more design-focused: their support from design representatives on executive levels,
and their focus on fostering *knowledge* of design thinking through education, and collaboration in cross-functional and interdisciplinary teams.

By appointing Rachelle King as the VP of Design, Spotify started to unify their way of communicating which led to a more effective way of working. David Thodey brought the emphasis of design to his position as the new CEO of Telstra and used it to create a stronger market position. And Hasso Plattner from SAP used design to create a stronger connection with the organization’s customers while also fostering a more collaborative work environment. Having design representatives on executive levels of the organization can thus be regarded as an important aspect. But design representatives also need to exist in other levels of the organization, as changing an organization cannot be done from the top down (Liedtka, 2010). It needs support and engagement from all members of the organization. Michlewski (2015) refers to the concept of multileveled and organization-wide design representation, as “critical mass” - the idea that the more design representatives there are in an organization, the easier it is for design to be integrated as a core concept and tool for improving products, processes and strategies.

Design representatives do not necessarily need to have a designer background. They can also be fostered inside of the organization, by gaining a general understanding of what design can offer (Acklin, 2013). Cross (2001) explains that design knowledge can be inherited through the activities of designing and the reflections of those activities (learning by doing), and through different kinds of instruction (tutorials, books, classes, workshops, educational programs etc). As such, ways of infusing knowledge about design thinking in the organization can be done through collaborative workshops and seminars (Michlewski, 2015), offering some sort of design education, or by having designers collaborate with non-designer teams or departments. These efforts are collectively seen in the cases with SAP and Telstra. However, if managers are not the driving force behind design education and collaboration, as they were in
Spotify, SAP and Telstra, these events and activities often need to be argued for in order to be approved by management.

2.2.3 Design knowledge as a dynamic capability

In her article, “Design Management Absorption Model”, Acklin (2013) suggest that the absorption of new knowledge can be regarded as a dynamic capability. Dynamic capabilities can in turn help an organization establish a more competitive position in the market (Madhani, 2010). In this sense, arguing that these activities and events potentially can lead to establish long-term competitive advantage, is one way of approaching the motion to invest in design. However, as previously explained, managers are driven by clean logic and analytics, and need to consider the ROI for investing more in a particular part of the organization.

According to Wescott et al (2013) the link between design and shareholder value was first uncovered in 2005 by the UK Design Council, in their study of design-led firms. The study examined 1500 organizations in the UK and identified 250 of them as design-led companies. What defined these companies as design-led was how their use of design had made a direct impact on key measures, such as competitiveness, market share, employment and sales, as well as “a sustained track record in design and innovation awards” (Wescott et al, 2013, p. 10). The result of the study showed that these design-led companies outperformed other companies in the Financial Times Stock Exchange (FTSE) 100 Index, over a 10 year period, by 231 percent (Design Council, 2008). Similar studies were then conducted in the US by the DMI, which again showed a significant financial advantage in stock value, for design-led companies (Wescott et al, 2013), and allowed for the Design Value Index (DVI) to be created (see Figure 3). The DVI tracks the value of selected companies that meet the design management criteria established
by the DMI. Furthermore, it monitors the impact of their stock investments in design and innovation over time, in relation to the S&P Index (Wescott et al, 2013).

![Design Value Index, Design Management Institute (2015)](image)

*Figure 3: Design Value Index, Design Management Institute (2015)*

The question regarding how design value is defined has encouraged the DMI to invest in a research program, that works to map out best practice methods and metrics for measuring and managing design investments. The value of design is, unfortunately, difficult to define and as such hard to measure (Wescott et al, 2013; Braga, 2017). For instance, it can be difficult to quantify the value that graphic design has in a project that was dependent on more than just aesthetics (Wescott et al, 2013). Or how much financial value design research brought to the launch of a new application. It is therefore argued that the outcomes from design processes, should not alone define the design value in a company (Björklund, Hannukainen & Manninen, 2018). Furthermore, if design affects everything - from how
products are made, sold, delivered, and perceived, to how business strategies and processes are formed - then arguably there are factors other than outcomes to consider when measuring design value.

Organizations are designed and built by people. As such they can be considered “products” (Junginger, 2006; 2008). The way to assess the impact design has in an organization, could arguably then be similar to assessing the perceived impact that design has on a product. This can be done both qualitatively and quantitatively; through surveys, interviews, ethnographic field studies, or even participatory design (Rohrer, 2014). In relation to this, Björklund, Hannukainen and Manninen (2018) state that design value should be measured by frequently conducting survey based studies within the organization, collect the data and over time improve on the areas where value is lacking. This is supported by Braga (2017) who adds that feedback sessions and discussions within the organization are needed in order to gain a better understanding about design. He further states that this process simultaneously will improve the organization’s design maturity.

2.3 Design maturity

Design maturity is a concept used to measure the impact and value that design has in an organization. By assessing how much design is used and what impact it has across different organizational areas, the organization can get an overview of where they currently are in their design maturity process (Bücker, 2018). Buchanan’s (2001) four orders of design, as well as Heksett’s (2017) designer role framework are useful when explaining the concept of design maturity, as they suggest that design has the ability to expand within organizations; from design as a formgiving practice to design used for strategy and decision-making. The previous chapter identified some of the stakeholders that are affected by this expansion, and suggested methods that can facilitate a more unified understanding of design. As implied,
generating a general knowledge about what design may offer, can contribute to the expansion of design’s role in the organization.

The design maturity assessment can be done using different scales and models. Common in these models are to depict that design gradually becomes more strategic, and that the highest level of design maturity can be found in design-led organizations that uses design (or design thinking) in strategic activities. In this chapter, four models that claim to assess organizational design maturity will be explained and briefly analyzed, starting with the Design Ladder by the Danish Design Centre. The chapter then moves on to explain how these assessment models could be used to generate knowledge, and potentially increase the level of design maturity in organizations.

2.3.1 The Design Ladder by Danish Design Centre

The Design Ladder (Figure 4) describes four different maturity levels of design in organizations: non-design, design as form-giving, design as process, and design as strategy. This model was created as a way to categorize the different levels of influence that design can have on a business (Doherty et al., 2015).
At the bottom of the ladder (level 1) design is basically non-existent. Neither user or stakeholder perspectives influence the product developing process (Doherty et al., 2015). The second level presents design as form-giving. Here, design is used for styling, form-giving and functional practices, such as graphic design or usability and interaction design (ibid). On the third level design is an integrated element in the development process but not just as a tool within projects, but rather as a holistic design methodology (ibid). The final step is where design is used as strategy. Here, design is a key element to the
development of business models and vision for the organization. Design in this level is not only used to produce value for customers, but for all stakeholders of the company (ibid).

However, the model is not without its limitations. Boztepe (2018) argues that the model might not be the best way of describing the evolution of design, seeing as multiple design practices do continue to co-exist side by side in the same organization (Heskett, 2017). Design as a formgiving practice does not stop just because the organization has evolved to the next step. Rather it is part of the escalation. Boztepe (2018) therefore suggest that it would be safer to discuss the expansion of the focus of design - or the absorption of design in an organization.

2.3.2 The Bubble Model

Similar to that of the Danish Design Ladder, Junginger’s (2009) “Bubble model” illustrates the four places of design thinking in an organization (see Figure 5).

![Figure 5: Bubble Model, Sabine Junginger (2009)](image)

The white circles within the colored bubbles represent design’s position and “absorption” in the organization. In the first bubble (from the left), design is viewed as an external resource. Design thinking and design methods have no constant place within the organization, rather they are “add-ons” and limited to traditional design such as aesthetics, functionality and communication (Junginger, 2009). In the second bubble design has a place in the organization. However, design thinking and design methods only concern
specific products and services (ibid). In the third bubble, design is at the core of the organization. Here, design thinking and design methods are used to unify products and services across the organization (much like the Original Brand Manager in Heskett’s model), to create a corporate identity (Junginger, 2009). Finally, in the fourth bubble, design is integral to all aspects of the organization. Similar to the Danish Design Ladder, design thinking and design methods are being applied at a strategic level, in order to inquire to a wide range of organizational problems. Here, the aim is to develop integrated solutions (ibid).

Arguably, this model is not without its limitations either, as it does not show or discuss specific organizational areas where design might be used. As such, the model is not very helpful when trying to identify where in an organization design value is created.

2.3.3 The Design Value Scorecard by DMI

The key patterns in which organizations use design, are, according to the DMI, as a service, as a catalyst for organizational change, and as a strategic design thinking resource to reshape business models and markets (Wescott et al, 2013). This formed a model called the Design Value Scorecard (DVS) (see Figure 6). This model was inspired by the work of Borja De Mozota, who mapped her values of design to the Balanced Scorecard and Porter’s Value Chain Model, to showcase a connection to business management tools and methods (Borja de Mozota, 2006).
Figure 6: Design Value Scorecard, Design Management Institute (2015)

The DVS is developed as a way of assessing where in the organization design delivers value, as well as designs’ impact and importance in an organization (Wescott et al, 2013; Buchanan, 2015). Subsequently, the model identifies levels of organizational maturity in adopting design (Buchanan, 2015, Wescott et al, 2013). The horizontally located zones in the model indicate what design is used for. The first zone (Development and Delivery) is where tactical value, or design as service occurs. It has a “tangible” or demonstrable ROI impact (Badding, Leigh & Williams, 2014), which means that design can be identified as a contributor to new revenue, after for example a redesign of a package (Wescott et al, 2013). This area is thus involved in aesthetic or functional development, as well as delivery, service and customer communication attributes (Wescott et al, 2013; Badding, Leigh & Williams, 2014). The second zone (Organization) looks at design as a connector or integrator, and indicate a rethinking of the organization, from a product oriented focus to a customer-centered focus. As a connector, the model looks at design as a means of connecting parts of an organization that perhaps were never previously connected (Wescott et
al, 2013). When many parts of an organization is connected by design, Wescot et al (2013) mean that design is integrated within the organization. In order to define design value in this zone, organizations need to look at metrics such as conversion, brand loyalty, customer value and market share (Wescott et al, 2013). The third zone (Strategy) focuses on the strategic value of design. This zone is according to Badding, Leigh and Williams (2014) and Wescott et al (2013) reserved for organizations that regard design as a core competency. The five levels of design maturity move vertically in the model, with level 1 as the lowest level and level 5 a the highest. Each level has specific attributes that “hints” to what the level suggests.

According to Buchanan (2015) the four orders of design can fit inside of the matrix of this model. Buchanan argues that the model is a system diagram, much like the Four Orders of Design. He continues:

“It offers a system perspective on all of the problems that designers have faced in the twentieth century - from graphic communication and industrial design to interaction design and organizational and systems design - but seen from the point-of-view of the organization.” (p. 16)

While this model can show where value is created in combination with the level of design maturity, thus fitting the criteria for how design value should be measured, it is however not clearly stated in the literature how this model is supposed to be used.

2.3.4 The Design Maturity Survey

In recent years, new versions of design maturity models have emerged, which focus on presenting a more comprehensive and general view of what design maturity is and what it means for an organization to be at a specific maturity level. One of these new models is developed by the design company “Artefact”, and is presented in the form of a survey. The survey is categorized into five different areas of design:
● **Empathy**, which refers to how well the company taking the survey understands its customers and uses that understanding to form business decisions;

● **Mastery**, which refers to the level of excellence in the company’s design process and execution;

● **Character**, which refers to how well the company culture supports design and encourages innovation;

● **Performance**, which refers to how design helps the company outperform its competitors, and how customers perceive the company brand;

● **Impact**, which measures the cultural, social and environmental impacts of the organization’s products and services.

Each category contains about five statements that the survey taker ranks on an agreement scale, ranging from “I do not agree at all” to “I totally agree”. The model uses the word “design” to refer to both the process and the output of creative problem solving. Artefact (2015) claims that this model works regardless if the company has employed designers or not, and refer to designers as “... the people who are involved in developing the customer experience for your company’s products and services”.

At the end of the survey, based on the survey taker’s individual answers, a design maturity scorecard, representing a high level assessment of the organization’s design maturity is presented. Here, the survey taker can see both the average scores within the separate categories, as well as the average score of the categories combined. This makes up the final score of the survey and represent the overall design maturity level of the organization and ranges between five different levels: initial, adopted, managed, integrated, and driven. The survey taker is then presented with an analysis of the scores, which in essence forms general insights to support further progress in the design maturity process. The purpose
of these insights are also to initiate conversations with colleagues and upper management (Artefact, 2015).

This survey based model fits well with how Björklund, Hannukainen and Manninen (2018) suggests that design maturity should be assessed. It builds upon Simon’s (1996) concept that anyone can be a designer. Furthermore, based on its construction, it provides a quantitative value of design in different areas of the organization - making it understandable for non-designers what the value of design can be in their organization. However, the statements are sometimes based on the epistemological assumption that anyone who uses the survey are familiar with the terminology used in it. As such, it might not be as useful or understandable for everyone in an organization. Furthermore, the survey is digitally based, and intended to be individually used. As such, the social requirement made by Braga (2017) is not met in this model, which according to him is key to increasing the organization’s design maturity.

2.3.5 Design maturity models as boundary objects

Using Artefact’s survey as a social assessment activity, rather than assessing the maturity level individually, Braga’s requirements would finally also be met. The remediated survey could then be used as a boundary object. Boundary objects are explained as artefacts or arrangements that allow different groups of people to work together, without necessarily reaching consensus (Star, 2010). They can be physical or digital artefacts, as well as forms, set of rules or concepts (Davies & Flynn, 2015; Keitsch, 2015). Board games and card games have in various research been classified as boundary objects, in the sense that they incorporate a concept, a set of rules, a storyline or script, or learning objectives (Brandt, 2006; Valente & Marchetti, 2015; Davies & Flynn, 2015). Furthermore, depending on the dynamics, a game does not necessarily require the players to agree with each other and reach consensus, thus making the game fit the requirements of a boundary object even more.
Kimble et al (2010) suggests that boundary objects are useful when examining knowledge exchange between groups of professionals. This is supported by Carlile (2002) who elaborates on what he perceives to be the three key characteristics of an effective boundary object. First, a boundary object should establish “…a shared syntax or language for individuals to represent their knowledge” (pp. 451). What he means by this is that if the boundary object fail to convey a commonly understood meaning, the boundary object will not facilitate knowledge exchange.

Secondly, Carlile suggests that an effective boundary object “…provides a concrete means for individuals to specify and learn about their differences and dependencies across a given boundary” (pp. 452). He then refers to standardized forms, methods, objects, models and maps that can provide “…a structured space where the representatives from each function can specify their specialized concerns” (ibid). An example of such a space could be a discussion session centered around a specific topic provided by the boundary object.

Thirdly, Carlile suggests that a boundary object should “…facilitate a process where individuals can jointly transform their knowledge” (ibid). Individuals should be able to apply what they know to the boundary object, while also gain new knowledge and use that to, for example, solve a problem. He continues to suggest that objects, models and maps currently are the only categories of boundary objects that enables knowledge to transform.

In her work, Keitsch (2015) explores the use of boundary objects in workshop environments, and how they facilitate communication and knowledge exchange. Her findings indicate that boundary objects can bridge gaps between different concepts, practices and views, and work as “…channels through which distinct individuals and groups can communicate and collaborate” (pp.6). However, when using boundary objects for this kind of purpose, Keitsch (2015) states that facilitators need to be aware of group hierarchies and discourse development, and possibly introduce routines that make all voices heard in the
workshop. By its definition and use, it would thus seem possible to use a boundary object, focused around the topic of design maturity, that not only assess the value of design in an organization, but that also evokes discussions. These discussions could arguably lead to a knowledge exchange regarding design that potentially could increase the design maturity in the organization.
3. Methodology

Due to its exploratory nature, the study took on an inductive research approach and adopted an interpretivist stance to the concepts of design epistemology (the study of designerly ways of knowing) and design praxiology (the study of the practices and processes of design) (Cross, 1999). The study’s main aim was to explore how organizations mature in design; what knowledge, processes and activities people within organizations find necessary in order to mature, but also what challenges and issues they see with the expansion of design. As such, a qualitative research approach was considered appropriate.

The data was collected through semi-structured interviews and workshops, and was ongoingly analyzed as the study progressed. This suggests that the study took on elements from *grounded theory*; a research methodology that focuses on continuous interplay between analysis and data gathering, in order to gradually compose a theory (Strauss & Corbin, 1994). Furthermore, the method of *open coding* was used to categorize and describe the findings from the semi-structured interviews, when analyzing the collected data. Open coding is often used within the grounded theory methodology to analyze qualitative data, by labeling it and grouping conceptually similar events, actions or interactions into categories or subcategories (Corbin & Strauss, 1990). The use of the method in this study is further explained in chapter 3.2.3.

To facilitate the aim of the study, the DVS model was introduced during the interviews as a way to ground the discussion to the topic of design maturity. The purpose of introducing the model was also to encourage the participants to provide ideas and thoughts on how to design the design maturity assessment activity. This suggests that the DVS model took the role of a *cultural probe*. The probe approach encourages people to reflect on and express their experiences, feelings and attitudes which, in turn, can provide inspiration for designers (Sanders and Steppers, 2014). A probe can be a material object that
provoke or elicit some kind of response (e.g. a postcard without a message), and is presented to end-users and other stakeholders, “...often with little or no guidance of how the end-users should treat them” (Sanders and Steppers, 2014, p. 9). The approach to use probes in design research is considered useful (Gaver, Dunne & Pacenti, 1999; Sanders and Steppers, 2014). However, this view is not entirely supported by all. Bryman (2012) argues against the use of probes, particularly in structured interviews, as they allow the conversation to wander away from the contextual questions. Another problematic issue with using probes in interviews is that the interviewer can influence the respondent’s answer through the probe (Bryman, 2012). However, Bryman also argues that “…if further information is required, usually in the context of an open question, standardized probes can be employed” (2012, p. 223). The issue of wandering conversations during the interviews in this study was not prioritized, as the format was already set to be semi-structured. To combat the issue of influencing bias, the DVS model was presented as an existing, standardized model to measure design maturity. The researcher briefly provided information about the model, based on the findings from the literature review. However, it was emphasized that interpretation on the use of the model was needed, since not much information was found on this aspect. Furthermore, the researcher’s own interpretations of the model was kept to a minimum. Instead, the focus was centered around the interviewee’s thoughts and interpretations.

The study also employed approaches and methods from the methodology of design thinking. During the first phase, the study adopted the empathizing and defining approach to explore what the participants in the study found difficult or challenging about pursuing a higher level of design maturity. This approach was also part of collecting data regarding the perceived benefits of reaching a high level of design maturity, as well as to continue collecting design requirements for the prototype. During the prototyping phase the study borrowed methods such as brainstorming and sketching from the design
thinking methodology. The prototype was then tested and iterated throughout the study, in order to improve the look and use of it.

The overall use of methods suggests that this study adopted a Research through Design (RtD) approach. RtD takes advantage of the insights gained from its adopted design methods and processes, in order to generate a better understanding of the studied field (Zimmerman, Forlizzi & Evenson, 2007). In other words, the RtD approach becomes a way for knowledge to be generated through the use of design processes. The RtD methodology uses prototypes as a way to anchor the focus of the research to something more tangible, experience a future scenario, connect abstract theories to experience, act as a carrier for (interdisciplinary) discussions, a prop to carry activities and tell stories, or as a milestone for reference in the process of a project (Stappers et al, 2014). According to Stappers (2013) prototypes evoke discussions and reflections. This is supported by Star (2010). However, she suggests the term boundary object for the prototype instead. As explained in the literature, a boundary object can be used in workshop environments to evoke discussions and subsequently generate knowledge (Keitsch, 2015). Evident from the literature was also that in order for design to mature, a general design knowledge on multiple levels of the organization is needed. As such, it was considered appropriate to shape the prototype around the requirements of a boundary object and to use it in a workshop environment. More about the prototype as a boundary object and the use of it in workshop environments can be read in chapter 3.3. The overview of the applied methodology structure of this thesis can be seen in Figure 7:
3.1 Research design

The structure of the overall research design was inspired by the ‘Double Diamond’ design model (see Figure 8). In this model, the first diamond is focused around the keywords ‘discover’ and ‘define’. The word ‘discover’ represents the diverging phase of researching and gathering information, while the word ‘define’ stands for the converging phase of analyzing and assessing the gathered information. The goal of the first diamond is to reach a definition of the problem at hand through the research and analysis. The second diamond is focused around the key words ‘develop’ and ‘deliver’, and entails the diverging process of prototyping and the convergent process of testing and refining. Its goal is to provide a solution to the defined problem. The model suggests an iterative approach to design that is centralized within the diamonds themselves.
In the research design model for this thesis, each diamond represents a phase in the study. In order to clearly relate the process back to the double diamond model, the phases are named after the keywords “Discover and Define” and “Develop and Deliver” (see Figure 9).

Figure 8: The Double Diamond design model, Design Council (2005)

Figure 9: Research Design model
3.2 Phase 1: Discover and Define

During this phase semi-structured interviews were conducted with designers, design leads and design managers at three different companies and organizations, located in Malmö, Sweden. During the interviews, the DVS model was used as a cultural probe to facilitate the discussion and uncover their reasoning regarding how design is fostered within the selected companies and organizations. The model was interpreted by the participants, and together with the theoretical framework, the collected data supported the development of a prototype. The following sections will explain the reasoning behind the sampling of the participants, how the data was collected during the interviews, as well as the chosen method for the data analysis.

3.2.1 Sampling

The debate of who is allowed to call themselves a designer has long been active within the design community. The well-cited work of Herbert A Simon (1996) promotes a ubiquitous way of thinking about the criteria for designers, arguing that anyone who engages in design activities is a designer. Thus, for the sake of limiting this study, there was a need to define the title of “designer” through other qualities. According to Zimmerman, Forlizzi and Evenson (2007) the term “designer” is generally used in the research community to refer to:

“...someone who has academic training or extensive practical experience in a discipline such as architecture, product design, graphic design or interaction design” (p. 2).

As such, this study chose to concentrate on interviewing people who had an academic background in design practice or at least a few years of professional work experience as a UX designer, design lead or design manager. In total, five participants, from three different companies, were able to participate in the
interviews. They were recruited through email, networking events, or outreaches on LinkedIn. Thus, this phase of the study employed the method of convenience sampling.

Before the interviews were conducted, the participants were presented with a consent form (see Appendix A). In this form the participants could choose whether or not they wanted their name and the name of the company they work for to be documented in the thesis. One of the participants wanted to be anonymous. To ensure this, their name and the name of the company that they work for are replaced with pseudonyms. Table 1 presents the participants, their professional title and the name or pseudonym of the company that they work for.

<table>
<thead>
<tr>
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<th>Company name</th>
</tr>
</thead>
<tbody>
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<td>Design Lead</td>
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<td>Tommy</td>
<td>UX Designer</td>
<td>The Anonymous Company</td>
</tr>
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<td>Johan</td>
<td>UX Architect</td>
<td>Visma Labs AB</td>
</tr>
<tr>
<td>Katarine</td>
<td>UX Designer</td>
<td>Visma E-conomics</td>
</tr>
<tr>
<td>Laura</td>
<td>Design Operations Manager</td>
<td>Arduino</td>
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</tbody>
</table>

Jayway by Devoteam started in the year 2000 as a Java consultancy firm, and has since then grown to become a “full stack consultancy” (Dennis, Design Lead, March 13, 2019) that also includes design. In 2017 the company moved from being a traditional service consultancy to become more of a design-driven service. According to Dennis, this entails that designers and developers are based onsite at Jayway instead of being temporary consultants with their clients. Furthermore, Jayway work with the client from a very early stage, helping them to deeper define the problem before they make a solution. The company is global with offices in Sweden, Denmark and in Palo Alto, California (US).

Visma is also a global organization, yet with its core business firmly based in Sweden. The organization specializes in developing finance, accounting, payroll and HR administration software for
businesses. It was founded in 1996, and in the year of 2000 the company switched its strategy to include both software services and consultancy services related to accounting and finance. Two years later they started offering products to schools and the public sector, especially in Norway and Finland. Their services are currently spanning over 800 000 business and public sector customers in northern Europe alone. Visma Enterprise is the owner of the units Visma Labs and Visma E-conomics, where Johan and Katarine work.

Arduino started in 2005 as a university project, that aimed to facilitate learning programming and electronics in an easy way without having to study engineering. The project has since then evolved, and especially since it is focused around the idea of open source, it has gained a large community of so called makers. Laura (Arduino, March 19, 2019) explains that there are two main philosophies: one is educational, and one is to democratize technology for everyone. Today, the company identifies itself as the world’s leading open-source hardware and software ecosystem, and has become the number one choice for electronics makers, especially for developing solutions for the IoT marketplace. Arduino is also a global organization, located in Sweden, Italy, Hungary, India and the US.

3.2.2 Data collection

The semi-structured interviews were conducted at the participants’ individual workplaces. Five separate interviews were conducted. The interviews were audio recorded and took between 35 minutes to an hour to complete. The outline of the interviews was to first provide a short introduction of the research topic, to set the stage for the conversation. The interviewees were then asked to state their name, their academic or professional background and their current position within the company. Moreover, the interviewees were asked to provide a short background of their company; how the company came to be, and what services or products they currently offer. This introduction proved to be an effective way to not only gather
information about the interviewee and their responsibilities in the organization, but to also gather information about the organizational structure and their current processes.

The interviews continued by introducing the probe - the DVS model. First the interviewees were encouraged to examine the model and to provide their own interpretation of the use of it. This approach paved the way for the discussion regarding where, within the matrix of the model, the interviewee identified their organization’s level of design maturity. It also opened up a discussion regarding the role and responsibilities of a designer within their design processes. For instance, could a UX designer or design manager also work with graphic design to some extent, in certain projects? Or vice versa, were graphic designers part of the planning and strategy-making part of the project?

The interviewees were then asked if they had any ambition of maturing further in design and how they thought this would benefit the organization. Furthermore, the interviewees were asked if they could identify ways of maturing and if they saw any issues and challenges with maturing in design. This input became essential to the construction of the prototype, as the prototype would aim to support organizations in leveling up in design maturity. Lastly, to further assist the development of the prototype, the interviewees were asked to provide their thoughts about the DVS model and if they could provide any thoughts on improving it. This provided some concrete design requirements which proved very useful in the second phase of the research.

3.2.3 Data analysis

The collected data was then transcribed manually by the researcher. This process involved listening through the recordings and make notes where the interviewees explained or stated something of value for the study. To structure this work, a spreadsheet was constructed consisting of columns, labeled after different segments of the interviews. The data was then inserted into these columns to provide an
overview and to facilitate the analysis of the interviews. This process corresponds with the method of open coding (Corbin & Strauss, 1990). During this phase the researcher structured the data using the following categories and labels:

● About the interviewee
  ○ Name, company, position

● Interpretation of the model
  ○ General interpretation
  ○ Identified level of design maturity

● Current processes
  ○ Who works with design?
  ○ How do they work with design?

● Perceptions of design maturity
  ○ Efforts of maturing
  ○ Challenges of maturing
  ○ Benefits of maturing

● The DVS Model
  ○ How is the DVS model intended to be used?
  ○ By whom is it intended to be used?
  ○ Model feedback

By applying this method, it was easier to analyze the data after the interviews had been transcribed. The spreadsheet provided a clear overview over all of the participants answers. Similar or contradictory answers were also easier to identify.
3.3 Phase 2: Develop and Deliver

The concept for the prototype was generated using different kinds of methods and techniques. First, it was brainstormed using the findings from the literature combined with the findings and insights from the interviews, as starting points. The way the brainstorming session was conducted was to create a mindmap of specific requirements and findings, and then add ideas to the map that would tie together the different nodes. According to Kumar (2013) the brainstorming process should be centered around finding which idea generates the most value to the user.

The results from the brainstorming session was converged into the idea of making a board game-like artefact that could support the requirements of both design maturity assessments and the requirements for a boundary object. Furthermore the idea to use the game in a workshop environment opened up the possibility to extend the exercise, and to further support organizations in their efforts to mature further in design. As the literature suggests, organizations have a hard time defining the impact and value of design. Consequently, identifying where to begin when aspiring to level up in design maturity is a challenge. It was therefore suggested that the game would facilitate the identification of activities that the organization could improve on, and subsequently increase their level of design maturity. It was also suggested that the prototype should not present winners or losers at the end of the game, since all players of the game would “be on the same side”. As such, valued points or scores were not distributed to participants at the end of a “round” - rather scores were appointed to the activities as average assessment values. This helped with the extended use of the game as well as the structure of the workshop.

The prototype was then sketched up on paper and quickly tested with a few other people. More about the initial test and the redesign of the prototype in the workshop setting can be read in chapter 4.2.
Based on the tests, the prototype was iterated and then given a more professional look prior to being used in workshops with three different organizations in Malmö, Sweden. The main goal of the workshops was to see how the prototype would facilitate discussion and knowledge exchange within the group of participants. Secondly, it was to allow the participants to assess the organization’s design maturity level. And thirdly, it was to attempt to support the organization in their efforts to mature, by adding exercises that would help the organization to prioritize where to begin in their process to mature further.

3.3.1 Sampling

Similarly to the interviews in phase 1, the participants in the workshops consisted of professional designers, design leads or design managers from companies in and around Malmö, Sweden. In total, nine participants, from three different companies, were able to partake in the interviews. Again, the participants were recruited through convenience sampling. The participants are presented in Table 2.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Dennis</td>
<td>UX Design Lead</td>
<td>Jayway by Devoteam</td>
</tr>
<tr>
<td>Viki</td>
<td>UX Designer</td>
<td>Jayway by Devoteam</td>
</tr>
<tr>
<td>Pia-Karin</td>
<td>CEO</td>
<td>ID Kommunikation</td>
</tr>
<tr>
<td>Per</td>
<td>Creative Director</td>
<td>ID Kommunikation</td>
</tr>
<tr>
<td>Erika</td>
<td>Content Creator</td>
<td>ID Kommunikation</td>
</tr>
<tr>
<td>Anna</td>
<td>Project Manager</td>
<td>ID Kommunikation</td>
</tr>
<tr>
<td>Torbjörn</td>
<td>UX Design Lead</td>
<td>Visma</td>
</tr>
<tr>
<td>Amanda</td>
<td>UX Designer</td>
<td>Visma</td>
</tr>
<tr>
<td>Fredrik</td>
<td>UX Design Manager</td>
<td>Visma</td>
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</tbody>
</table>
3.3.2 Data collection

In total, three different workshops were conducted at the three different companies cited in Table 2. The workshops were estimated to take around 2½-3 hours depending on the number of participants. Conference rooms were booked by the participants, where the prototype was set up a few minutes prior to starting the workshop. To facilitate for the researcher to remember different scenarios from the workshop, notes and photos were taken during the workshops. Permission to take photos was given orally. It was also orally contracted that specific information regarding products, services or information that the participants considered to be confidential, would be kept out of the documentation during the workshop.

Directly upon starting the workshop, the participants were introduced to the prototype. The researcher explained what the participants were going to do, and then guided the participants through the workshop. However, as soon as the participants had understood the flow of the exercise the researcher merely observed and took notes. More about the prototype functionality, workshop guidelines and results can be read in chapter 4.2 and 4.3.

3.3.3 Data analysis

After the workshop the researcher compiled the notes and highlighted the parts where the discussion had become more lively, or where there was a big difference in assessment scores. Furthermore the use of the “I have no idea”-card (further explained in chapter 4.2) was also documented in the results by the researcher. The reason for this was that when the “I don’t know”-card was played, it instinctively sparked a conversation which often led to a more detailed discussion, allowing the participant who played the card to gain insights about that specific topic.
3.4 Limitations

This study was conducted over a time period of approximately 20 weeks. Because of this time restriction, it was decided to limit the study geographically, and to only include participants from organizations located in and around Malmö, Sweden. Subsequently, the time limit also affected the availability of the participants within the different companies. Participants had to be contacted on short notice, and consequently many were unavailable at the proposed time. For future research it would be recommended to schedule interviews and workshops several weeks ahead of time, and to also prepare for unexpected drop-outs. The consequences from these limitations were that only a few organizations were visited and, in turn, relatively few participants took part in the study. Arguably, this could have a negative effect on the validity of the study, since there is a lack of representative data. Because of the small size of the study, the participants cannot represent the target group in its entirety. As such, a future longitudinal study including more participants could potentially provide a stronger data pattern which, in turn, could validate the results from this study. With this in mind, it is worth mentioning that this study focuses on an evolutionary concept (a process) and is qualitative in its nature. The results that are provided in this thesis are representative of a specific point in time, with specific individuals. As such, it is highly unlikely that results will ever be exactly replicated. Still, a stronger pattern could potentially be identified in future research.

3.5 Ethical considerations

According to Brennen (2017) “...individuals’ agreement to participate in research must be an informed consent based on complete, accurate and open information”. A consent form was therefore constructed prior to the audio recorded interviews that included the purpose of the study, how the interview was to be
performed, and how data would be collected and stored (see Appendix A). Furthermore, the consent form explained how the data was going to be used in the study, the time involvement of the participants, participants rights, as well as contact information to the university and researcher. The final section of the consent form included an opt-in form and a place for the participant to sign his or her agreement to participate in the study. The participant received a copy of the consent form, and were reassured that they could contact the researcher if any questions would arise or if they wanted to add or remove any information from the interview, after the interview was conducted. If a participant wanted to be anonymous in the study, they were given a pseudonym for both their name and for the company that they represented.
4. Results

In this chapter the results from the study are presented, as well as the progress and reasoning behind the development of the prototype. The results are presented in three different sections. The first section presents the findings from the interviews, the second presents the development of the prototype, and the third presents the findings from the workshops.

4.1 The interviews

The interviews supplied the study with a deeper understanding of how design can be used in organizations - both from a practical and a strategic point of view. The interviews also presented detailed insights into the challenges, perceived benefits and ways of maturing in design. Furthermore, useful thoughts and opinions were shared regarding the DVS model, which in turn facilitated the development of the prototype. The results from the interviews are presented in five different subsections below. These sections represent key aspects and take-aways from the interviews. For added clarity, the table showing the participants from the interviews (Table 1 from page 44), and the DVS model (Figure 6 from page 32) are presented below. It is also important to again clarify that these interviews were conducted separately, onsite at each organization.

<table>
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<tr>
<td>Laura</td>
<td>Design Operations Manager</td>
<td>Arduino</td>
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4.1.1 Initial interpretation

In the beginning of the interviews the participants were asked to interpret the DVS-model without much prior information about it. Dennis, Johan, Laura and Katarine used the model to assess where the use of design was most prominent within specific organizational areas, while Tommy saw it more as a way to assess different roles in the organization and the value that they created. For instance, when Dennis discussed how advanced the company was in terms of functionality and UX, Tommy discussed how designers approached design in terms of functionality and UX.

A common opinion among all the participants was that the model was confusing or unclear to use. The participants argued that the reason for this was mostly because of the vague wording used in the model. They all argued that if they could not understand the meaning behind the different levels or areas in the model, they would not be able to make a clear assessment. Furthermore, they all stated that their
results would likely differ from time to time even though nothing had changed during the time between the assessments. This was because they would have different understandings of the wording depending on their own experiences and personal developments.

Another reason for the confusion regarding the model was brought up by Dennis. He initially criticized the model for being “very crude”. For example, the model suggests that the development and delivery parts of design should be broken down only to aesthetics and functionality, which Dennis found to be a narrow-minded suggestion. As a designer he saw more uses for design. This was also a common conception among the other participants. They all stated that design can be so much more than just the categories presented in the model, and pointed to not just areas but also activities that were influenced by design. In turn, this insight suggested that the prototype would probably need to be constructed differently, and perhaps revolve less around set areas of design and more around tasks and activities that are influenced by design.

The levels of maturity were also an issue when it came to the interpretation of the model. Again it was argued by Dennis that the wording of the attributes, specifically those in level 3-5, were confusing and not formulated well enough to make sense to an organization:

“When I come to the "Process Standardized", "Process varied and modified based on feedback", and "Process constantly improved" it's sort of all of the above for us. We have processes that are already standardized, and modified and proactively and consistently improved. But the latest process that I am working on, which is more about concrete working with design, I am constantly improving it (...) So I don’t really know what this means.”

Other than the terminological confusion, it is evident by this quote that design maturity is more of an escalation or absorption, rather than a simple step-by-step process. Just because you constantly improve processes in one area, does not mean that you do not have standardized processes in another. This idea
corresponds with what Boztepe (2018) and Heskett (2017) suggests - that multiple design practices continue to co-exist side by side in the same organization during the process of maturing.

Katarine, on the other hand, stated that the wording of the attributes were quite relatable to her personal experiences as a UX designer, and provided a relatively clear interpretation of the different levels. She explained level 1 as a level where a designer needs to prove the value of design by “putting out fires”, acting fast, or provide something extra to a project. She continued with interpreting the second level as the level where the successful things that designers have done are repeated, to prove the point of design even further. In the third level, she explained that the repeated actions have been recognized as a process, and that standardized guidelines for how to approach a new problem or task are probably defined. In the fourth level, Katarine stated, these guidelines would be refined. Here, she suggested that someone should lead the way for design, a representative with enough mandate to manage processes and make changes. She then went on to interpret the fifth level as a level where designers “…don’t have to fight and preach about design all the time”. However, here she criticised the wording of the attribute:

“…to call it “Optimized”? Maybe they are looking for “Embedded” instead? That would make more sense, because it’s not really optimized if it needs improving”.

This insight strengthens the requirement of needing to clarify the descriptions of the model’s attributes, in order to improve the assessment. Similar to the insights provided by Dennis, it suggests that there is an issue with how the wording of the model corresponds with the process of maturing. Moreover, it suggests that the attributes for each level needs to be less open for interpretation, as well as more defined in their wording.

To summarize, the structure of the model needs refining and not to be so dependent on the areas where design is already represented, but rather focus on the activities where design can be used. The
reason for this stems from the participants’ view of design as something more ubiquitous and expandable, rather than categorized into specific areas. Furthermore, the wording needs to be clarified and better correspond with the experienced process of maturing in design.

4.1.2 Identified design maturity levels

Based on the different interpretations, the participants then attempted to identify their organization’s level of design maturity. The majority of the participants identified their organization as somewhere in between different levels. The reason for this was that they saw that there was already a process in motion to go from one level to the next. Furthermore, there were factors such as location, size of the company, and/or the work processes of the teams that influenced the participants’ assessments. All participants worked for global organizations, where aspects such as cultural or educational differences, experiences, and language barriers needed to be taken into consideration when working with design. For example, employees in Sweden might have a similar understanding of user-centered design as employees of the same organization in Spain. However, communicating or conveying this understanding in a commonly comprehensive way can be challenging. This made the participants become unsure of how design was perceived in other locations.

Subsequently, this tied into the factor of the processes used in these relatively large, global organizations. It was argued that it might be difficult to know how people work with design in other locations, or even in other areas or levels of the organization. Because of this it was suggested that the participants were to focus on their own, local working environment when assessing the design maturity level of their organization. The participants’ identified levels are presented in Table 3.
Dennis identified his organization’s design maturity level as very high throughout all areas in the DVS model. In terms of aesthetics and functionality, Dennis saw that the organization already had processes and ways of working with graphic design and interaction design in place. These processes are constantly being improved to fit their own and their clients’ needs. When discussing design as a connector and integrator he did, however, argue that design processes could be improved to further connect different non-designerly parts of the organization. In addition, he saw a need for integrating design processes and methods throughout the organization in a more consistent way.

In terms of strategy Dennis identified the company as very design-driven. As a firm that values design knowledge and offers “...design driven end to end projects” (Jayway, 2019), Dennis saw that design was a prominent drive-force for the organizational strategy and business model. However, he also stated that explaining design practices to management, and educating the entire firm in the mindset of
design, could be improved by working with it more consistently. During the interview he stated: “It is nonsense to think that UX is only for the designers”.

Johan and Katarine work for the same organization, Visma. However, they work in different units, in different locations. In terms of aesthetics, Johan explained that Visma has standardized manuals for the “look and feel” of the products and services that they offer, but that they are in need of refinement. He briefly elaborated on this:

“As apparently, we are in the process of adjusting these manuals to fit our products better and to more clearly convey to the end user that they are using one of our products. (...) So, there is an active ongoing process of improving what we have, but we are not optimized in how we convey our idiom. There is an ambition, but currently, this is not how we work.”

As such, and in terms of the model, the process is standardized, but in need of optimization. Katarine also identified her unit as being between levels 3 and 4 in aesthetics. Much like Johan, she saw that they had dedicated resources that work with refining the graphics manuals.

In terms of functionality, Katarine believed that the overall level of product usability was rather low, stating: “If you have never touched our software before it can be very difficult to use, mainly because of the terminology.” However, within the scope of the entire organization, she rated the use of design to be at level 4 in this area, since they still view design as a big part of their product development processes. In the interview with Johan, this reasoning was also apparent. He started by identifying the functionality of their products and services at level 2. However, he then started to take the rest of the organization into account and ended up scoring functionality at level 3, stating: “There are works in progress to reach a higher level in this area. For example, we recently got a new UX manager, so hopefully, we will be able to improve usability”.


When addressing design as connector, Johan stated that his team worked in a rather silo-based manner and that the UX department was relatively separate from the rest of the organization. Not excluded or ostracized, but rather that they did not communicate a lot with other divisions. As an example, he stated that the products that they produce have many different distribution channels, with different kinds of marketing units who manage different products. Designers have some contact with these units but mostly on an ad-hoc basis, when something needs to be fixed. To work less silo-based was something that he considered important, in order to gain a better view of how the products were presented and perceived - even from within the organization itself. While he mentioned that regular status meetings with representatives from different departments were held, he also stated that a more efficient way of communication and interaction with different departments would be good. However, he considered this to be a difficult process because of the size of the organization. This issue was also brought up by Katarine, who emphasized the importance of communication: “The difficult thing with connector is communication, and respecting each others domains. But I guess we are about level 3,5 (...) Sometimes we can be clashy.”

When discussing integration and organizational processes, Johan provided an interesting and important input. He explained that Visma’s organizational processes were not all uniformly standardized - not all processes were designed the same or with a focus around human-centered aspects. As such, he identified this area to be at level 2 in design maturity. However, he then suggested that this was not necessarily a bad thing:

“I am not sure that everyone needs to be working as designers all the time because there might be other needs. (...) We also need to respect how others might prefer to work. (...) As designers, we have this kind of self-absorbed image of ourselves as the voice of the customer - that we have methods that everyone should use, and that everyone should be working the way we work. And this can often come across as rather arrogant... like: “Hey, you guys in the customer support
team! You don’t really seem to know how to do your job correctly!”, and that can be problematic.”

This quote is important for a few reasons. First, it suggests that the need to work as a designer might not be relevant for all members of an organization. Secondly, it touches upon ethical considerations regarding work practices; that it is important not to force something onto someone else, or to undermine someone because of their preferred way of working. And thirdly, it touches upon the phenomena that Borja de Mozota (2003) highlights about designers not being very good communicators and that they have an ego that is centered around knowledge and expertise. To combat this, one could try to implement more knowledge about design thinking (Liedtka, 2010) through voluntary workshops and seminars (Michlewski, 2015), and stress that designers are available to teach people more if they are interested.

When identifying the level for design as integrator, Katarine differed a lot from her colleague’s score. Although she saw it difficult to identify how all processes were designed and used within the organization, she came to the conclusion that her team was constantly refining their processes. Therefore, she argued that they would be on level 5 in this area. What is evident by the differences in these scores is firstly that an organization can have different maturity levels simultaneously, depending on the scale of what is being assessed. When assessing a design team, the design maturity level can be higher. The design knowledge is more extensive, critical mass is higher, and design methods are used more frequently. Meanwhile, when assessing the organization as a whole, the design maturity level can be lower, as design knowledge, critical mass and the frequent use of design methods are diluted. Secondly, it is evident that design maturity assessments are subjective. Johan made an assessment based on his experiences and perceptions of Visma’s processes in general, while Katarine made an assessment based on her experiences and perceptions of her team’s processes. This corresponds with Braga’s (2017) theory about design
maturity assessments being subjective. While someone interprets and scores a certain way, another might interpret and score completely different.

Finally, regarding strategy, Johan stated that the ambition to offer well-designed, innovative, usable and desirable products and services was there. However, the process of how to create those kinds of products was not always conveyed to the customers. Still, Johan explained, this had begun to change and design was more and more considered to be a natural part of the products they produce - much thanks to their new UX Manager. Having a design representative at an executive level was perceived to give designers more authority in regards to developing concepts and conducting research.

In regards to the customers, Johan found it important to emphasize that the ones who buy their products and services are not always the end users. Furthermore, their business customers can vary in size, and according to Johan, this has an impact on the importance of novelty, usability, and desirability of the product or service. He explained that design is not necessarily something that needs to be in focus for larger customers. As long as the product or service has been sold it is “basically enough”. However, for smaller companies design is of more importance, as the customers in this group are more likely to be the end users too. Thus, design plays a bigger, strategic role when it comes to this target group. Johan, therefore, argued that depending on the customer, the company would score differently in the strategic area. The ambition and mindset of using design more strategically with all of the customers are there, but in reality, it is not practiced as much.

In regards to how design is used strategically and the impact that designers have on business strategy and vision, Katarine stated the following:

“From a high-level perspective, stuff is happening, but what actually happens is maybe different (...) We still fight a lot. I don't really have an impact on what's on the roadmap so I'm kind of the annoying person who questions the strategy. (...) People can see the value of design but they still don't understand the process. So we are probably lower [in design maturity] in this area, in my opinion”
What can be seen from Katarine’s experience with management is that they still speak different languages - especially in terms of process. Educating management in design processes would arguably improve the projects and processes, seen from the designers’ perspectives. However, further educating designers in managerial decision-making processes would arguably also facilitate better communication between the two parties. As such, the key aspects to get along seems to be education/knowledge and communication.

In general, Tommy interpreted the model from a more personal perspective. Aesthetics and functionality were parts that he personally did not consider himself working with as much anymore. However, he was aware of the existence of a manual for how things would “look and feel” when it came to the products that the company he works for offers. This manual, he identified as standardized but that it was in the process of being modified to fit a wider range of products. As such, he scored the design maturity of these areas between the levels 3 and 4.

When it came to process, Tommy saw a lot of room for improvement. He explained that his main focus as a UX design lead was to “optimize the daily processes used by the UX designers”, but that he also worked in cross-functional teams with different projects concerning processes - sort of like an in-house consultant. The work behind establishing standardized and uniformed processes was regarded by him as a big undertaking. But he was proud of the work that had been done so far and saw several benefits with establishing these standardized processes throughout the organization. Still, the processes were not all uniformly standardized yet and therefore he identified the areas of connector and integrator to be between levels 2 and 3.

When it came to strategy, Tommy identified the ambition of working with design at a strategic level as high. However, in reality, using design to impact business strategy and vision was not something that he considered himself doing. It was not related to his current role. He did, however, see design being
more and more implemented in executive levels of the organization, mainly by recently appointing a new UX manager. Although, he argued that they still needed more design representatives for design to have a more substantial impact on strategic-level work, and to facilitate better processes in the organization. He identified the area of strategy to be at “the early stages of level 3”, as the organization had recognized the need for a UX manager and that the position had been filled.

Last but not least, Laura from Arduino was interviewed for this study. When addressing the area of aesthetics, Laura identified the company at level 4, stating that they had guidelines in place but that they were not constantly improved or considered something driving the company forward in that sense. In terms of functionality the identified level ended up between 3 and 4. She stated that the design processes for development and delivery depended on the project. If it was a completely new product that was being developed to be used in a new area or situation, the team might not have a managed level of design in place, simply because they lack the current expertise and knowledge to develop that type of product. In that situation they could only rely on previously defined processes.

When addressing the area of design as connector she stated that a new Chief of Design had recently been appointed with a focus to create more consistent processes, and improve the communication between different teams and offices. By having this design representative at an executive level, she predicted that the company would rapidly evolve from level 2 to level 4, just within the upcoming six months. Similarly, when it came to integration, she explained that because of the predicted improvements with design as a connector, design would become more of “a horizontal thing”, where it could become more integrated across the organizational areas.

In terms of strategy, she stated that the organization, from the beginning, had a big focus on design. However, the focus changed from using design as a strategic element to simply a resource, when the market shifted and the business was unstable. Now that the organization has established its position in
the market again, Laura predicted that design would have “a voice” again, when creating new business models and strategies for the organization. Thus, she rated the organization between levels 2 and 3, as this process was beginning to become more standardized again. What we can conclude from this is that just as internal and external factors can facilitate the increase of the design maturity level, they can also affect the design maturity in a negative way. In other words, design can devolve as well as evolve in organizations.

4.1.3 Perceived benefits of maturing

Common among all the participants was the ambition to mature further in design. When asked why, Dennis believed that evolving and reaching the highest level of design maturity would improve the products, processes and strategies of the organization. Similarly, Tommy emphasized that the products would become more “real” and relevant for the users and that this, in turn, would increase the revenue for the company. In terms of processes, Tommy also stated that less time would go towards developing useless or unnecessary features which, in turn, would lead to more effective and clear work processes. In terms of process, Tommy argued that with more understanding for design processes in higher levels of the organization, as well as with the company’s customers, designers would receive more time to perform user research. These benefits were also predicted by Johan and Katarine during their interviews. Laura emphasized the importance of being up-to-date and relevant to the users and within the organization itself, by stating: “Design is not only about beautifying things (..) We also care about the spreading of knowledge, not just profit”.

Both Tommy and Katarine saw the opportunities for a better working environment. Katarine emphasized this by stating that she thought that the employees would become more proud about their accomplishments if they got to be part of creating something good and useful for other people, rather than
just for the profit of it. In terms of strategy, the participants all predicted being more flexible and proactive in the market.

4.1.4 Ways of maturing

When presented with the question of how the participants would proceed with maturing in design, all participants emphasized the importance of creating more knowledge and understanding of design across the entire organization. Dennis identified two main aspects of how Jayway would continue to mature in design. The first aspect was education, in which the company was quite engaged by hosting competence days, brown bag seminars, and other design events exploring UX trends. The other aspect was process. Here Jayway themselves have developed what they call an “Innovation Map”. This map is printed out and hung up on the office walls. The map is focused around 21 questions that designers can ask themselves before a project is going into full-scale development, for example: “Do you have a clear understanding of the challenge?”, “Should the problem be solved using technology?”, or “Have you conducted user research and what were the insights?”. Which questions are necessary to answer depends on the situation and is thus up for discussion. If a question is needed, but cannot be answered, the model suggests tools or methods to provide the designer with an answer.

Tommy also emphasized the need for knowledge and education about design, both on an executive level and a non-executive level. He argued that not only must executives be educated in the values and processes of design, but designers must also gain a better understanding of business strategy and the things that are needed for a business to survive financially. With this knowledge comes an improved understanding of processes, terminology and language. As can be seen in the literature review, in chapter 2.2.1, this is not an uncommon way of thinking amongst scholars, when exploring the gap between strategists and designers (Liedtka, 2010; Liedtka & Ogilvie, 2011; Michlewski, 2015; Buchanan,
2016; Borja de Mozota, 2003). Tommy, Laura and Katarine also emphasized the importance of having a design representative on an executive position, for support. However, Johan suggested that designers should lead the way in teaching the different parts of the organization about design.

Finally, Katarine stated the importance of having design on the roadmap - the strategic plan - as well as emphasizing that having the appropriate full-time resources would definitely help with the improvement of design maturity. One reason for including design in the roadmap was for management to see how much time was actually needed in order to develop new products or services. It was also argued that by strategizing with design processes in mind, the organization would become more user-centered as a whole, which would not only benefit the customers but also the employees.

4.1.5 Design requirements for prototype

The insights provided by the participants in the interviews can be summed up together with the participants’ thoughts and opinions about the DVS-model. As previously mentioned, it was a common conception that the wording of the model was difficult to interpret. Furthermore, the structure created a confusion that made the participants hesitant to answer and pinpoint their level of design maturity. Rather, the participants chose to position the organization in between levels. Thus, the most prominent feedback on the model was that the wording would be less open for interpretation. It should be more explanatory and clear. Dennis, Tommy and Laura suggested that the model could take on the dynamics of a questionnaire or a survey, where clear questions or statements would be answered or assessed.

Another feedback was that the activity to identify the design maturity in the organization would not be a solitary activity. Rather the participants saw a need for more people to attend the assessment to make it more of a collaborative and inclusive activity, where insights and knowledge could be shared and discussed. In relation to this, they also emphasized the importance of thinking about the purpose and the
user of the model. Dennis, Tommy and Katarine suggested that a mix between designers, design leads, managers and executive board members would be a good target group. However, Katarine added that the focus should be on including designers, seeing as they could explain design terminology to non-designers. Without the designers, she imagined that the assessment and exercise as a whole would be misinterpreted.

Tommy and Johan saw a need for presenting the results in a relevant and comprehensive way for all participants. Numeric or percentile values would perhaps suit the managers more. In regards to this, the participants also emphasized the need to use the model in a continuous and frequent manner. Laura suggested that the model could be used before or after projects, or during a kick-start events or in workshop environments. She also saw a need to have an activity to prioritize and assign tasks to the team members. Furthermore, she emphasized the need for reflection and discussion in order to exchange and process new knowledge and insights.

Finally, Katarine pointed out that the results would be made public to the rest of the organization in one way or another. This, in turn, led her in to the issue of scalability, and the idea to make the model digital and shareable.

4.2 The prototype

Based on the insights and design requirements from the first phase, the concept for the prototype was brainstormed by the researcher. The outcome of the brainstorm suggested the use of a boundary object to facilitate discussions about design. By using the prototype as a boundary object in workshop environments, the prototype was expected to generate knowledge (Keitsch, 2015) and would also fit the requirements found in the literature regarding the social aspect of design maturity assessments (Braga 2017; Björklund, Hannukainen & Manninen, 2018).
After brainstorming the concept, the prototype was sketched up on paper (see Figure 10). Following the design requirements, the prototype took the shape and form of a board game/card game. It consisted of a game board, assessment cards, statement cards (not shown in image) and a scoreboard. The concept was to present the participants with statements which they then got to assess using valued cards. If the participants agreed with the statement, they played a highly valued card and if they did not agree they played a card with a low value. The values were then summed up on a scoreboard and the final score was then calculated to reveal the final design maturity score. However, the goal of the workshop was not only to assess the design maturity of a company. In addition, the workshop would aim to support the company in their efforts to mature. This was initiated by adding a prioritization- and idea-generating exercise after the assessment. Furthermore, in order to drive action, the participants would assign tasks to their fellow colleagues by the end of the workshop.

The concept was quickly tested by the researcher and a few other participants to see if it would fit the requirements for an effective boundary object (Carlile, 2002) and if it would be engaging to use. The findings from the tests suggested that the number of participants would have to be more than two, in order for a valuable discussion to arise. Furthermore, the tests showed that the initial statements needed to be reformulated in order to be less open for interpretation. The test also suggested that the scores, which were assigned after each statement was read, also needed to be documented onto the statement cards. This, in order to facilitate the final calculation of the design maturity score, as well as the additional exercises at the end of the workshop. This feedback led to a redesign for some of the dynamics of the prototype. However, the overall concept of using the prototype as a boundary object for discussion and knowledge generation was considered successful.
The prototype was then iterated and redesigned to embody a more professional look (see Figure 11). The statement cards and scoreboard were printed out and laminated for multiple use. The structure of the prototype focused on five main activity based categories: customer knowledge, process and execution, design support, competition, and impact. More about these categories can be read in the following section. Compared to the Design Ladder and the DVS model, the structure of the prototype suggested a more transitional way of how design expands in an organization. Still, the decision was made to keep the categories numbered, in order to guide the exercise using the artefact.

The color blue was chosen as it has been suggested by color theorists to be linked to competence, intelligence, communication, trust, efficiency, duty, security and logic (Labrecque & Milne, 2011; Fraser & Banks, 2004). These keywords seemed fitting, in regards to the professional use of the prototype. Playing with different shades of blue, rather than keeping it all in one solid color, created more of a
dynamic, aesthetic look. One card was, however, singled out in color - the “I don’t know”-card. This card had a red tint, as it symbolizes a warning or alert during the game. A more in-depth explanation about the different elements of the prototype, as well as how the prototype was used in the workshop environment can be read in chapter 4.2.2 and 4.2.3.

![Figure 11: Design Maturity Assessment Game](image)

4.2.1 The categories

In this section, the five categories of which the statements revolve around, will be further explained. Each statement can be found in Appendix B.
• **Customer knowledge.** The interviews revealed an emphasis on user research as a key element to create more “real” and useful products and services for the users. As such, this category is concerned with how the company works with user research and methods to cultivate a better understanding of their customers. It has a clear focus on the efforts taken to explore the customers’ behaviours, needs and desires, and how the findings influence what they produce and how they produce it.

• **Process and execution** revolves around how the company works with design methods during a project. Methods such as idea-generation and prototyping are taken into consideration for this category, as well as the experiences of working with these methods. The interviews also suggested that design processes, as established in teams, organization-wide or even globally, are seen as important factors to the organization’s design maturity, as they can work across multiple organizational areas. For example, during a project an organization can have a process set up that requires designers to include knowledge and resources from other departments or teams. As such, activities that facilitate cross-functional work and a more interdisciplinary and cooperative culture, rather than silo-based work, were also included in this category.

• **Design support** covers how much design methods and processes are supported and encouraged within the organization. While seemingly similar to the cross-functional focus of the previous category, this category suggests ways in which the company facilitates and accommodates designers with the resources and tools needed to produce products, services or systems that are useful and relevant to the company’s clients or customers. Furthermore, it covers designers’ influence on important decisions, as well as how well design is represented in the different levels
of the organization. The importance of design representatives was extensively expressed in the interviews, as was resources like time.

- **Competition** covers how design influences the organization in terms of market focus. It ranges from how design is seen as a strength when positioning itself in the market, to how it affects the perception of the brand by the company’s customers and clients. It also emphasizes on the knowledge related to the financial value of design. This category was not as strongly influenced by the interviews as the other categories were, or at least not in the same way. The participants from the interviews identified benefits from maturing in design, such as being more flexible in the market. The literature refers to this aspect as *competitiveness* (Design Council, 2008; Wescott et al, 2013; Heskett, 2017; Acklin, 2013). Thus, there was room for exploring this aspect of design.

- **Impact** focuses on the extent to which the organization uses design as a drive-force to become more sustainable, ethical and regarded as a company mindful of what it produces and how it produces it. It covers topics such as environmental impact, working with underserved markets and local communities as well as ethical work practices and value-creation on a larger social and societal scale. This category is also heavily inspired by the literature, especially Buchanan’s fourth order of design (2001; 2015). However, the interviews also brought useful insights into this area, such as thoughts on ethical work practices in combination with mindfulness.

4.2.2 The assessment

The way the assessment of the five categories was constructed, did not differ much from the initial concept of the game. First, the participants in the workshop were presented with *statement cards*, which they then assessed using *assessment cards* (see Figure 12). The assessment cards were valued from 0-5, depending on the level of agreement. For example, the “I strongly disagree”-card had a value of 0, while
the “I totally agree”-card had a value of 5. This scale-based feature was strongly influenced by the survey-based design maturity model by Artefact, and allowed the participants to not only express their level of agreement grammatically, but to also connect their opinions to values. The assessment cards were dealt to the participants in the beginning of the workshop and were kept in hand by the participants during the entire assessment. The participants took turns reading the statement cards. After a statement card had been read, the participant chose an assessment card on their hand that represented their level of agreement for that particular statement. The chosen assessment card was put face down on the table, and when everyone had made their decision the cards are flipped. The reveal of the different assessment cards evoked a discussion that allowed each participant to elaborate on their choice of card. The discussions were timed to take approximately 2 minutes, and were regulated using a timer. If there were more than three participants in the workshop, the participants were allowed an extra minute to discuss. The reason for timing the discussions was to keep within the timeframe of the workshop (2-3 hours), as well as keep the discussions grounded to the topics at hand. After the discussion the participants were allowed to change their assessment cards.

One of the assessment cards did not have a value connected to it. This is labeled as the “I have no idea”-card. This card indicated a lack of previous knowledge exchange within the organization. In other words, if a participant chose this card, it was clear that this topic was not particularly discussed at the organizational level of that participant. The “I have no idea”-card was also useful in terms of knowledge exchange within the group of participants. If someone chose this card, the other participants’ knowledge, experiences and insights influenced the unknowing participant, which often led the unknowing participant to change their answer to a valued card instead. In this way, the prototype facilitated knowledge generation about design processes within the organization, which according to the literature, is one of the key factors enabling organizations to mature in design (Acklin, 2013; Michlewski, 2015; Keitsch, 2015).
The values on the final assessment cards were then documented in a so-called “scorecard” (see Figure 13). The average score of each statement card were also written down onto the actual statement card. This was, as previously mentioned, done to facilitate the calculation of the average maturity value of each activity area, as well as the final design maturity score in the end. Writing the average score per statement on to the statement cards also enabled the cards to be organized according to value, which was useful in the prioritizing phase of the workshop. The participants then continued with assessing the next statement, discussing and documenting the average results onto the statement cards, until all statements had been assessed.
4.2.3 Additional support

When all the scores had been calculated, the workshops moved on to a reflection stage. Here, the statements were put in numeric order based on their individual average score. The participants were then encouraged to vote on three statement cards, by putting a colored dot on them. After voting, the top three agreed upon statement cards were singled out. Next, post-it notes were handed to the participants. It was now time to generate ideas or solutions for how to improve the three selected activities. The participants wrote down ideas on the post-it notes and then put them next to each statement card. After a few minutes,
the results were reflected upon. In this stage of the workshop it was also encouraged to assign tasks related to each activity. The workshops ended with a brief reflection of the entire workshop.

4.3 The workshops

As mentioned in the methodology chapter, three workshops were conducted at three different organizations located in Malmö, Sweden. Similar to the interviews, the participants were a mix of UX designers, design leads, and design managers. In addition, one of the workshops included professionals with job titles such as creative director, content creator and CEO.

4.3.1 Workshop #1: Jayway by Devoteam

The first workshop was conducted with two participants, Dennis and Viki, from the company Jayway by Devoteam. After explaining the premise of the exercise, the participants immediately started to engage with the prototype. The participants’ initial thoughts were that the prototype was visually pleasing, which added to an increased motivation to participate. Only a few comments were made regarding some typos and the font choice. After the first statement was completed, with guidance from the researcher, the participants repeated the same steps, and the researcher took on more of an observing role in the exercise.

Noted from the workshop was that there was a difficulty to interpret the word “customer”, which appeared repeatedly in the statement cards. The reason for this is that Jayway mostly concentrates on B2B projects which, in turn, made the statements difficult to analyze. Were the statement cards referring to the end user as the customer, or to the client as the customer? Furthermore, the formulation of the statements were sometimes taken very literally. An example of when this happened was with a statement card that appeared in the category “Process and execution”. The statement reads: “Prototypes never need to be pixel perfect”. Here, Dennis put a lot of emphasis on the word “never” and gave the statement the lowest
score (I strongly disagree, 0). Viki, on the other hand, rather saw it as a general statement and put the emphasis on the “need to be” part of the sentence. She gave the statement a higher score, (I somewhat agree, 3). Similarly, a statement within the “Impact” category, that reads “Our products and services have very low impact on the environment”, was discussed in regards to the statement formulation. The word “impact”, was interpreted by Viki to have a negative connotation. A low impact on the environment for her was thus considered a good thing. Dennis, on the other hand, had another perspective on the statement. He argued that a low impact on the environment could be both good and bad. For example, if you want to change the environment a high impact is good. But if you want it to stay the same, a high impact is bad. Discussions like these were important for further development of the statements, as they suggested that the formulations still needed to be improved in order to keep them less open for interpretation.

The “I have no idea”-card was played two times by Viki during the exercise. What followed was, as anticipated, an interesting moment of knowledge exchange. Dennis, who happened to only play valued cards throughout the exercise, provided insights from his previous experiences and knowledge that, one time out of two, influenced Viki to change her non-valued card into a valued card. The use of the “I have no idea”-card was somewhat dependent on relevance too. For example, during the assessment of the statement: “We know what financial value design has to our company”, Viki played the “I have no idea”-card. She explained that she had a general understanding of the financial value, seeing as the firm focuses on design as a service, but that the exact value was not communicated to her in a direct way. However, she also stated that compared to receiving direct feedback from the users of the product or service, this information was perhaps not particularly relevant for her to know. Yet, she questioned this reasoning as well - was the financial value of her accomplishments something she should be aware of? Her reasoning for choosing this card was thus two-sided, and was difficult to influence by Dennis. She
therefore chose not to change the card to a valued one, which consequently led to the question being left out of the later calculations. The choice to exclude statements with standing “I have no idea”-answers were, however, changed in later workshops. Instead the person who put down the “I have no idea”-card was left out of the calculation of the average score for that particular statement. An exclamation mark was also put on the statement card, to remind the participants during the prioritization phase that this was a topic that perhaps needed some extra attention.

During the workshop, three issues and challenges were identified. When discussing statements in the “Customer Knowledge”-category it was noted that the time for questioning assumptions and collect behavioral user data was limited. This was considered an issue, not because the organization does not find user research important, but rather because the importance of user research was sometimes undermined by the client. Further emphasisation on the importance of user research was thus considered an ad hoc activity. However, it was unclear how this would be done in detail.

Another key issue was that design was not considered well-represented in all levels of the organization by the participants. However, here they argued that design in its entirety would not be relevant or even preferable to implement in all levels - just as design’s financial value would not always be relevant for the designers to know. This insight was also relevant in terms of the initiatives taken by both designers and non-designers to teach, respectively learn about design. Here, Viki stated the importance of how design education was structured, and what this, in turn, could lead to. For example, if everyone who attended a seminar or workshop about design, afterwards would consider themselves designers, it could potentially cause problems. The concern was that the “real designers” would be undermined in the organization. However, creating a general understanding about the value of design methods, and their importance to the product, the client and the organization might be useful.
Lastly, both Dennis and Viki identified instances where communication and, to some extent, in-house collaboration was lacking in the organization. They stated that there were still some language barriers to overcome when discussing design methods, and that there was a lack of discussion across different teams. Non-designers did show an interest in knowing more about design methods whenever a conversation arose around the topic. However, few initiatives were still made by non-designers to know more. Similarly, if designers were not asked about design directly, there was no conversation around the topic, outside of workshops and seminars. Viki stated that some efforts, like the 21 questions hanging on the walls in their office, at least made the design process more visible for everyone and provided some knowledge into how they work with design. However, both Dennis and Viki agreed that spreading design knowledge could be done more effectively throughout the entire organization, including across organizational levels and in offices in other locations.

It was also stated that communication between designers in different teams could be improved, as the designers were rather silo-based in their own work and projects. If experiences, information and insights were to be shared across in-house teams, it was hypothesized that designers would be more unified and aspire to share knowledge with each other. At Jayway some steps have been taken towards this by initiating so called “designer therapy” sessions, where designers can share problems and experiences with each other. However, these sessions were argued not to be so much focused around collaboration between designers in different teams. Rather, they seemed to be more about designers sharing their problems and thoughts around general design topics.

The identified issues were briefly discussed during the workshop, but no clear solutions were suggested to solve them. Neither were there any clear suggestions of who would be assigned to solve the issues. The reason for this was mainly a lack of time. Because the timer that was used to keep track of the discussions was silent, it was easy to forget about it or ignore it. As a consequence, the discussions
became too long and, subsequently, there was no time for brainstorming or assigning tasks at the end of the workshop. Even still, the participants provided useful feedback regarding the prototype and could be summarized as follows:

- Through the use of the statements, many topics were brought up that normally would not be addressed with members from specific levels of the organization, or even at all. The statements provided something for designers, design leads, managers or even people in other organizational teams and divisions to provide insights, knowledge and opinions about.

- Both participants argued that different colors for the different categories would facilitate the prioritization phase later on. Also, the font choice could be improved as it was somewhat criticized for its readability. Some typos were also found in the statement cards and on the board. Also, the scorecard did not follow the aesthetics of the rest of the prototype.

- Dennis saw an issue with the statements being too open for interpretation, and suggested that the statements would be focused around experience rather than knowledge. Viki agreed that the statement were open for interpretation. However, she did not mind the different kinds of questions as it was evident from the exercise that Dennis’ knowledge had informed and influenced her view on different topics.

- Both participants argued that there should be two kinds of prototypes - one for B2C focused companies and one for B2B focused companies.

- The assessment took a long time, mostly because the timer was silent. The participants both suggested a more visible and loud timer. Perhaps, digitally projected on a screen together with the statements.

- For scalability they suggested that the prototype should be digital. However, they did not elaborate on how the social aspect of discussing the statements should be remediated.
4.3.2 Workshop #2: ID Kommunikation

The second workshop was conducted with four employees from ID Kommunikation, a design agency that create campaigns, websites, apps and other visual material for well known businesses and organizations, mainly located in the south of Sweden. The group included participants within different levels of the organization, such as the CEO, Creative Director, Project Manager and one of the Content Creators in the company.

A few alterations based on the feedback from the first workshop were done prior to the second workshop. However, because of the short amount of time between the workshops (2 days), the focus was put on only a few feedback points. One was the timer used to keep the discussions shorter. Instead of using a physical hourglass as the time keeper, the researcher timed the discussion using a digital timer on a smartphone, that made a sound when two or three minutes had passed. In addition, a new scorecard that followed the aesthetics of the rest of the components was printed and laminated for multiple uses. Furthermore, some of the statements were altered to more clearly define what was meant by the word “customers”. As the two following workshops were to be held at companies that were B2B focused, the statements were formulated to put focus on either clients or users.

Again, the participants adopted the concept of the game in a quickly manner. While they sometimes had some difficulty with the english wording in the statement cards, they moved effectively through the different statements, keeping the discussions brief and to the point. The implementation of the loud timer facilitated the short time spent on discussing the statements. However, the participants were also very clear in their communication with each other, which contributed to the brief discussions. Even though there were four participants instead of two this time, the workshop was fully completed within the two hour timeframe.
All of the participants were very active and did not refrain from expressing their opinions, even though the CEO of the company was present. One prediction from the researcher prior to the workshop were that the presence of the CEO would influence the answers, making the participants score higher than what they originally had the intention of doing. However, the presence of the CEO proved to have the opposite effect. The workshop was instead considered an opportunity for the different levels of the organization to converse in an open and accepting environment, where all opinions and interpretations were valued equally. As such, the workshop proved valuable to all who attended. No one was left out of conversations and there was no pressure to agree with anyone’s assessment. However, it is important to note that the dynamic of this group was not dependent on the hierarchy of the participants, nor the workshop environment. Rather, the participants had already established this kind of open work environment at the office which, in turn, contributed to the workshop.

During the workshop there were some statements that stood out in terms of discussion length and assessment differences. For example, the statement that read, “We ideate and share our opinions before deciding on a solution” was interesting from different perspectives. Erika (Content Creator) experienced that this was done excessively and regularly in their team, while the other participants argued that the ideation phase and discussion could be initiated much earlier in a project, together with the client. Often the client has a firm idea and concept already in place, which does not leave enough room for ideation and alternative solutions. After the discussion, it was unanimously agreed that the designers, project managers and the CEO could be more aggressive in terms of questioning their clients’ assumptions and solutions. Ideas on how to make this happen was also shared in this discussion, where it was argued that “feeling out the client”, and get a sense of how they have come to their conclusion, through workshops and design exercises, could facilitate this process.
Another statement that led to an interesting discussion read: “In a design process, we see to that every step is fully completed before moving on to the next one”. All participants agreed that there was no structured design process currently in place to follow, and as such the process steps would never be completed. However, Per (Creative Director) argued that if there had been a process in place, he was critical for each step to be completed in order for the process to proceed, adding: “Design is all about iterations. So it would not make sense to complete each step in the process”. The other participants agreed with Per’s statement. However, they also added that sometimes they use different kinds of design processes, rather than for instance exclusively using design thinking. Mixing methods were sometimes needed depending on the projects. Still, a solid structure to derive from in each project was lacking and wanted by all participants, including Pia-Karin, the CEO. She stated that if there was a process that included the different steps of a project, it could in turn help the company structure their meetings with clients and perhaps also facilitate the previously discussed statement regarding ideation in earlier stages. A more structured process was argued to also facilitate communication within the organization in different ways. The participants suggested that sharing research findings as well as distribute internal information regularly could be part of the design process and something that they could start doing immediately.

The “I have no idea”-card was played more frequently in this workshop, compared to the first one, and was often played by Erika and Per. Similarly to the previous workshop, the phenomena to inform and influence each other’s statements during the discussions, so that everyone had a valued card in the end, was apparent. The knowledge exchange influenced the participants to change to a valued card in multiple instances, except for one during the statement: “We use multiple kinds of metrics to assess the quality of what we have produced.”. Here, Per argued that he still did not have the proper information to change his opinion, and that this was mostly grounded in the lack of processes within the organization.
The quality was mostly dependent on clients’ opinions of the produced products, concepts or services, rather than the evaluation later on. While the company values long-term projects with clients, improving what they have previously delivered after user testing was not as common.

When discussing the statement “What our sales team and marketing team offer, is exactly what we deliver” it sparked a discussion on whether or not it was a bad thing that they didn’t offer exactly what the sales team had offered. While everyone agreed that they of course delivered what the customer wanted, they also argued that sometimes they exceeded the customer’s expectations, making this statement an interesting point of reference for later assessments.

After the assessment, the statement cards were organized numerically according to their individual average score (see Figure 14). The participants were then encouraged to pick out three statements that were considered most relevant and important for the organization to focus on.

![Figure 14: ID Kommunikation, workshop: prioritizing.](image)

After picking the three statements, the participants were given post-it notes and were encouraged to come up with ideas and solutions in order to improve these activities (see Figure 15). In this case, the activities
to improve on were 1) prototype building, 2) user research focused on behaviors, and 3) customer feedback loops (see Figure 16).

Figure 15: ID Kommunikation, workshop: idea-generation

Figure 16: ID Kommunikation, workshop: presentation of solutions
Similarly to the first workshop, the aspect of time assigned to user research was considered to be very limited. Unless it was a requirement from the customer, or an in-house project, the participants agreed that there was no time to conduct research on user behaviour. Per argued that if the teams were presented with a proper brief or clearer specifications grounded in user research, the projects would in turn run more smoothly and the teams would be more effective.

Furthermore, the participants saw that they did not have a proper design process in place to make clear for their clients that user research was needed in order to make their deliverables relevant to the end users. Pia-Karin concurred and added that a solution to this could be to hire people dedicated to only focus on user research, but also that the project managers and sales team needed to be more aggressive in promoting user research to their clients. As an effort to infuse this knowledge, Anna (Project Manager) suggested that stressing their offer of having workshops with the clients in an early stage of their collaboration or partnership, could facilitate this. Furthermore, Per elaborated on the issue from a general perspective, by ironically stating that ID Kommunikation did not really have an identity - something completely unique that they offer to their customers in terms of the processes or projects. It was agreed that focusing more on this aspect, in turn, could further improve the company’s reputation.

Related to the issue of time there was also no real process in place to collect customer or user feedback, which in turn would make their collaborations with businesses more long-term based. Offering to measure the outcome of projects or collaborating more closely with their clients was argued to be solutions to improve this.

The participants also saw a need to focus on creating more prototypes - or rather to communicate that it is okay to show unfinished and raw projects, and that it is acceptable to fail. It was agreed that this had to be communicated to everyone within the organization, but also that it was an activity that should be
driven by the design team. More meetings or presentations where prototypes were showed needed to take place, and it was also suggested by the CEO that internal education was needed within the organization, to explain that prototypes do not need to be an as close representation of the finished product as the designers (or non-designers) might think. This was considered a good plan, and it was unanimously agreed that by lowering the expectations more options and solutions to problems would be created. Furthermore, it was argued that this would help the company spend less time on making useless or ill-designed features in the long run.

Internal communication and collaboration was also considered a challenge. Designers were considered to be siloed in their work with clients, and reluctant to share projects with each other. Anna stated:

“People are very fixed in their projects. They are very focused on solving the problems they are faced with by themselves, as it is communicated to them to be the “owner” of their projects. In turn, problems and possible solutions are rarely shared across teams or levels of the organization, unless it is very much needed.”

Erika agreed with this statement, but added that while it was an uncommon practice to share things from projects with other teams, the teams were still open to ideate and share their insights. The problem was rather that there was no internal process in place that allowed this activity to be facilitated in a more frequent and consistent manner. Per agreed and stated that if there was a process in place for this, the internal design knowledge would probably improve. Both Per and Pia-Karin saw a need for this to happen.

In the end, the participants had mainly positive feedback to give regarding the prototype and the workshop. They expressed that it gave them a chance to elaborate and reflect on current processes, or the lack thereof, and also that the exercise gave them a clear overview of which aspects to focus on, how to solve the issues related to these aspects, and to see who would take the responsibility to make the changes
happen. The only criticism the participants had on the exercise was that the statement cards were not color coded, which would help making the overview more visible. Furthermore, they saw that some of the statements could be further improved in terms of differentiation between clients and users. However, it was also stated that the lack of differentiation was good, as it made the participants reflect on who their main target group really is.

During a conversation with a contact at the firm after the workshop, it was stated that the CEO found the workshop very useful and that efforts to increase the design maturity were being put in motion. The workshop with the model was thus considered a catalyst for change for this company.

4.3.3 Workshop #3: Visma Enterprise

The third, and final, workshop was conducted a couple of days later at Visma Enterprise. Other than a few grammatical changes to the statements, no iterations had been made to the prototype prior to this workshop. Three participants were selected internally to attend; one design manager (Fredrik), one UX lead (Torbjörn) and one UX designer (Amanda). Since the organization is very large and located in more than one country, and in more than one place within each country, the participants agreed on assessing the design maturity locally.

Similar to the other workshops the participants adopted the rules and dynamics of the exercise very quickly, which allowed the researcher to observe and take notes during the discussions. The participants were heavily engaged in the discussions which made the use of the timer essential to the exercise. Topics that the participants felt needed to be further discussed were noted by the participants, so that they could resume the discussions at a later time. Arguably, the three minute time to discuss was considered to short for all of the participants to have a say on the topic.
In terms of customer knowledge the participants were eager to point out the same issues that were presented in the other workshops. Time was an issue in terms of measuring user satisfaction as well as analyzing user behaviour. A reason for this was that Visma’s customers normally are not the end users. This tied back to the interviews with Johan who stated the same thing. However, this was also considered a process issue. The ambition to know more about the users was high, but there was no process established for how to collect that kind of data. Feedback from the customers was, however, frequently conducted onsite. But it was more by chance than a requirement that the designers found out about how the software was used during these meetings. Furthermore, there was no process in place to manage this information.

Moving on to the category of process and execution, the discussions were similar to those facilitated at ID Kommunikation. It was not a requirement by the participants to fully complete each step of design processes, as the processes themselves are iterative. However, clearly standardized processes were not in place from the beginning. As such, the participants saw the need to establish these and to get mandate from upper management to do so.

The focus on constructing prototypes were strongly integrated within the organization. However, Fredrik argued that there is still too little research to make use of the prototypes. Furthermore, he thought the teams moved too quickly onto the design phase instead of focusing on understanding, defining and testing the prototypes first. If the purpose of a prototype is to test ideas, make the work run more smoothly, and make the features more useful, enough user research and more time for testing was considered needed.

Amanda and Torbjörn added that time constraints were also dependent on the unbalanced distribution of time for each phase in the design process. Travel time, formal and informal meetings and focusing on maintenance of older projects and features were factors that needed to be taken into
consideration. They both argued that instead of adding more features to a system, old features should be prioritized. Currently, this was not the way of working, which in turn made projects lack the appropriate time for user research. Projects were focused around problem solving using new features, rather than making changes to already developed features. For some of the software that the organization provides, the approach to stop, break down and rebuild was also argued to be preferable by the participants.

When presented with statements from the design support category, the participants explained that the support from management had improved, but it was still lacking - especially on an executive level. Fredrik stated:

“There is no appointed CXO (Chief Experience Officer) in the organization, and I don’t think design is used strategically at all. Our UX design is based on an old marketing strategy, and this culture is difficult to change.”

He continued to state that design representatives on the middle and executive levels were sparse. There were too few design leads, which he acknowledged to be a determining factor to market competitiveness. The more design representatives on multiple levels of the organization, the more impact design could have in the organization. Subsequently, that could make the company more design-focused and flexible on the market. The other participants agreed to this statement.

In the category addressing competition the highlights of the discussion was centered around the aspect of measuring the value of design. Again, it was argued that there were no processes in place to do this, even though the UX team promotes the slogan “give measurable value”. It was also argued that if there was such a process in place to frequently measure and manage the data, it would also be easier to prove design’s value to the executives.

Another discussion within this category was sparked when presented with the statement “What our sales team and marketing team offer, is exactly what we deliver”. Here, the participants agreed that
this area needed more work. The expectations of the systems that Visma delivers are often very high, but the final products and services are often perceived not to meet those expectations - especially not in-house. This tied together with the statement “We are always proud of what we produce”, which the participants had varied feelings and opinions about. Amanda stated:

“We might be proud of what we managed to produce and deliver given the circumstances, but overall I think that we want to do so much more. Our products can be improved a lot, but the time for this is often not given.”

This statement was agreed upon by Fredrik and Torbjörn. Torbjörn also added that a solution to this would be to work more closely with the marketing or sales team, so that they can lower the general, public expectations, without damaging the positive aspects of their reputation, and instead aim to exceed the expectations for the customer. Underselling a good product can sometimes be better than overselling a product that needs more work.

In the final category the statements that were mostly discussed, focused on environment and the support of the local community. In terms of the environmental impact Amanda was very engaged, arguing that there needed to be an investigation regarding how much the company spends on travel, paper and plastic consumption, and purchases that require long distance shipping. Her perspective on the matter was that this was a very important issue that needed to be further explored, considering the scale of the organization. Fredrik and Torbjörn agreed, adding that it would be good to get tangible results from that investigation and present to executive management. Visma’s products are in and of themselves not affecting the environment per se, as they are software based. However, Fredrik pointed out that keeping the servers cool and the amount of energy that is needed to produce the software has never really been calculated.
Finally the participants discussed the statement “Our company is known to support the local community in one way or another.”. This statement got the participants discussing how they could improve the company image. Amanda stated:

“For example, we sponsor a variety of things. Currently we are sponsoring the She Conference, Women in Tech, different sports events, and educational programs and schools - but I don’t know if we are known to do this. I am not sure we are being associated with these organizations or events, which is sad.”

This conversation, in turn, tied back to how the marketing team could improve the image of the organization, but also who and what Visma choses to sponsor. Unsure of the underlying strategy behind these sponsorships, the participants emphasized that it would be good to sponsor events where the products or ideas that the organization is known to produce or endorse, would help their reputation.

The “I have no idea”-card was only played one time, by Fredrik, during the environment-focused question. As there were no tangible results regarding this matter, he argued that he could not make a good enough assessment of the matter at hand. Even after Amanda’s argumentation, he wanted to stick with the “I have no idea”-card as his answer, in order to make that statement stand out from the rest.

After the assessment, the workshop moved on to the next step. Like in the workshop at ID Kommunikation, the participants got to organize the statement cards and then vote on the statements, to single out the top three things that they saw were the most relevant and pressing matters to address. Their top statements were 1) “Design is well represented in all areas of the organization, including executive management”, 2) “What our sales team and marketing team offer is exactly what we deliver” tied with “We know what financial value design has to our organization”, and 3) “When important decisions are being made, designers are asked to provide their insights” tied with “Designers are given the appropriate amount of time to execute their tasks and projects”. The participants were then encouraged to write down possible ideas and actions on how to improve these activities.
In order to improve the design support in the organization, the participants suggested that they needed to first prove the value of design and make it tangible for executive management. Then the budget for the design team was suggested to increase, allowing the department to hire more design representatives for the team and the organization. In terms of improving the perception of the products and services, as well as the local reputation, it was suggested that better communication processes needed to be established between different teams and departments. To combat time issues Torbjörn suggested that a “UX strike force” should be implemented, which would consist of designers that are not particularly busy in their assigned projects, to help out in places where design would be needed. It was also stated that the tools and resources needed to be evaluated, and that the work processes needed to be more firmly established in the organization.
Another issue that arose during the workshop was the interpretation of the words “we” and “the organization”. The participants stated that it was sometimes not clear if the statements were referring to the team, the local company or the organization as a whole. Amanda, on the other hand, argued that while it was sometimes confusing, it was still a good reflective exercise to imagine the organization as a whole, instead of just the local units. However, the feedback was still important to receive as it hinted that more work needs to be done to further clarify the statements.

During an email conversation with one of the participants after the workshop, it was requested that another workshop would be done at the organization together with people from other parts of the organization. The participants saw the prototype as a valuable assessment tool and the overall workshop as a good way to initiate action regarding organizational areas in which they felt they needed to focus more on. As such, the prototype, again, proved its value as a facilitator for discussion and in combination with the workshop the prototype also supported the organization to mature further in design.
5. Discussion

This study aimed to provide an understanding of how design expands within organizations, and to explore what benefits, efforts and challenges there are for organizations to mature in design. Furthermore, the study explored the use of a boundary object as a facilitator for discussion and knowledge exchange regarding design, as well as a tool to support organizations in their efforts to mature in design. In this chapter, the results of the study will be discussed in relation to the findings of the literature review. Furthermore, this chapter will include recommendations for future work within the field of design maturity, as well as a discussion regarding the limitations and methods used in the study.

5.1 Benefits of maturing in design

Findings from the results suggested that organizations see benefits to design maturity, such as:

- A unified understanding of design which, in turn, would lead to fewer misunderstandings and confrontations with management.
- Processes that emphasize user research and prototyping, which would lead to more structured ways of working, and less time spent on useless features and functions.
- More relevant, useful, and innovative products which, in turn, would increase customer loyalty and revenue for the organization.
- A more flexible and proactive approach to market changes and trends, which in turn could lead to an increased competitive advantage.
- A larger impact on society and the environment.
- An increased sense of pride towards the organization as a whole, but in particular towards the products and services they produce.
To elaborate, by maturing in design the participants in the study imagined that they would cultivate a work environment that better serves the needs, wants and values of the employees and their clients and customers. This, through iterating work processes, cultivating a common understanding of design and what it may offer, and allowing design to take on a strategic role in the organization to make more of an impact on the market, society and the environment. This corresponds well with the findings from the literature. Both Buchanan (2001; 2015; 2016) and Brown (2009) argues for user-centered work environments that includes processes facilitating the making of more desirable, useful and innovative solutions. In addition, design as process is argued to have a positive impact on customer loyalty, brand perception and ROI (Björklund, Hannukainen & Manninen, 2018) as well as competitive advantage (Acklin, 2013; Björklund, Hannukainen & Manninen, 2018).

What was somewhat surprising about the findings regarding the perceived benefits, was the emphasis from the participants on feeling an increased sense of pride for the organization and their work. The initial literature that was used for this study, lacks to convey this aspect in relation to design maturity in a clear manner. Feeling proud about the accomplishments of the organization as well as for the projects that the teams of the organization produces can, according to Gouthier and Rhein (2011), have a direct, positive effect on commitment towards customers and/or users, turnover intention, and creativity. By putting more emphasis on user research, the participants argued that they would feel an increased sense of pride in being part of the organization and what they produced. They also suggested that user research in combination with prototyping would allow them to explore new alternatives and areas. In turn, this could lead to more innovative solutions that potentially could help them secure a more competitive position in the market. However, since these benefits were hypothetical, validating the aspect of an increased sense of pride as a derivative of leveling up in design maturity, could potentially be considered a topic for future research projects.
Furthermore, a longitudinal study that validates the perceived benefits *during the process* of leveling up in design maturity would also be needed. I hypothesize that the benefits increase or *evolve* throughout the process. For example, when an organization make efforts to level up in design maturity the knowledge of design and what it may offer increases throughout the organization. However, this knowledge may also evolve throughout the process depending on external factors such as technological advancements, or through the adaptation of new knowledge and insights from (new) in-house design representatives. As such, organizational change can also be considered an iterative process, and to explore this further an ethnographic approach would be appropriate for that kind of study.

5.2 Efforts of maturing in design

In order to increase the level of design maturity, the findings from the study suggested the need for a unified understanding about design. It was suggested that this would be generated through a number of different activities, such as cross-functional and multileveled collaborations and workshops, seminars and design events, making processes visible, and by appointing design representatives in all levels of the organization. Furthermore, it was argued that by increasing the knowledge of design, a common language would be fostered. This is supported by Liedtka (2010; Liedtka & Ogilvie, 2011), Buchanan (2001, 2016), and Michlewski (2015) who indicate that an increased understanding of design will facilitate clearer communication about the subject, and vice versa.

Supporting design knowledge in the organization through cross-functional and multileveled collaborations and workshops are some of the approaches that IDEO has adopted when explaining and conveying the value of design to non-designers (Brown, 2009; Michlewski, 2015). However, as Liedtka (2010), Borja de Mozota (2003) and Michlewski (2015) state, designers can benefit from learning about business strategies from management too. This idea was only briefly discussed during the interview with
Tommy (The Anonymous Company, March 15, 2019), where it was acknowledged as a necessary step to establish clearer communication with non-designers. However, in addition I argue that creating a unified design language among designers should be acknowledged as the initial approach to cultivate organizational design knowledge. Diversity exists even within teams, people come from different educational backgrounds and have different experiences with design. As such, designers should also share their knowledge and experiences with each other. The steps taken at Jayway by Devoteam are good examples of efforts designed to increase organizational design knowledge. They host events, workshops and seminars about design, and as mentioned in chapter 4.3.1, they have also initiated the concept of “designer therapy”. However, as the participants from Jayway also stated, collaborative work between designers in different teams are also important factors to the organizational understanding of design.

Solutions on how to improve collaboration between designers in the organization were, however, unclear. This issue could, thus, be a topic for future research. A suggestion would then be to juxtapose the solutions to the type of organizational culture and/or organizational level of design maturity, and to conduct several studies in order to validate the findings. This study would of course be dependent on whether or not improved collaboration and communication among designers are considered as needed within the studied organization.

During the interviews it was commonly suggested by the participants from Visma and Arduino that design representatives needed to be hired or appointed on all levels of the organization, especially in executive levels, in order for the organization to mature in design. While this idea corresponds well with the concept and purpose of critical mass (Michlewski, 2015), the participants seemed torn by the idea of fostering design representatives within the organization. As suggested in the literature (Acklin, 2013; Cross, 2001) design representatives do not necessarily need to have a designer background and can be taught in-house by designers. However, the concern regarding the potential consequence of undermining
design education, which was pointed out in the literature by Liedtka and Ogilvie (2011), did also surface in the study. In order to deal with this paradox, promoting design thinking instead of design in general would perhaps be a viable option (Liedtka & Ogilvie, 2011). Still, as argued in the literature, it is of importance that the methodology is taught by someone who is familiar with it (Liedtka & Ogilvie, 2011). As such, designers would be the ones leading the organizational change towards an increased understanding of what design may offer.

Furthermore, the idea that everybody in an organization do not need to know about design or design thinking (Johan, Visma, May 15, 2019) is also an important aspect to consider. Acknowledging and respecting the fact that there are other, preferable ways of working, arguably relates to ethical policies of any organization (as long as the work practices are effective and within the policies of the organization). It is important not to force something onto someone else. However, it is also important to highlight that change is essential for organizations to survive (Junginger, 2006; 2008), and in this process good communication and common understandings are key aspects to effectively succeed (Eppler, 2007; Kotter, 1996). Thus, the balance between openness towards new knowledge, and respecting boundaries and differences needs to be considered. Paradoxically, by acknowledging that everyone has different needs and ways of working, the organization could, arguably, employ the methodology of design thinking in order to compromise or find new common grounds and cohesive processes, wherever these are considered needed.

5.2.1 The need for improved processes

Other than the aforementioned challenges related to the efforts of maturing in design, the participants also discussed challenges that were related to the current work processes and what could be done to improve these. For example, an issue that could be identified within all of the organizations was that the
participants felt like they did not have the appropriate amount of time to conduct user research. The ambition to do this, however, was high, as they all saw a need to obtain this data to produce more relatable and useful products and services. The desire to make useful and desirable things are inherited traits of a designer (Liedtka, 2010; Lawson, 2006). Also, questioning what the client wants, and add user data as a requirement for projects, were considered as ad hoc factors (Viki, Jayway, May 18, 2019; Anna, ID Kommunikation, May 20, 2019; Torbjörn, Visma, May 22, 2019). Redesigning the processes to make time for gathering user research, as well as constructing prototypes was considered to enable designers to spend less time developing products and services that have significant flaws and bugs. This approach can be linked back to the case study at Spotify (Yee, et al., 2017) where designing better processes allowed the employees to become more thoughtful in how they execute projects and what they spend their time doing.

However, to introduce this approach in all processes and to use them consistently would, according to the interviewees, not always be optimal either. Certain projects are sometimes in need of heroic efforts to solve the issue at hand in a quickly manner, where the time for research and prototyping is even more limited. Still, having a database consisting of data obtained from user research, heroic efforts could be justified and become easier to handle. Furthermore, the developed product or service could potentially become more useful to the end user. The participants from ID Kommunikation suggested that hiring people to gather user data would be an appropriate approach, while the participants from Visma suggested the implementation of a “UX Task Force” (Torbjörn, Visma, May 22, 2019) consisting of designers who had fewer stressing tasks at hand. Researching best practices for how to manage time pressed projects in a design-led organization would also be an interesting topic for future research.

Visualizing processes and making them accessible for everyone in the organization was also considered an alternative to convey the importance of user research in the organization, as well as a
motivator to gather user data. At Jayway, the emphasis on user research is rather visible though the 21 user questions hanging on the office walls. This approach corresponds well to Norman’s (2004) research on visceral understanding of information. Even though heroic efforts are sometimes needed at Jayway too, they have still obtained a catalogue of user data to utilize. Viki and Dennis did, however, still see a need to emphasize user research even more in projects with their clients, so that the database would remain updated (Jayway, May 18, 2019). Furthermore, the process is relatively new and localized in only one place in one of their offices. To standardize this process throughout the organization would require more work. As such, this too could be considered as a possible angle to consider in regards to managing time pressed projects.

5.3 Using boundary objects to support design maturity

Using the prototype as a boundary object proved to facilitate discussions which, in turn, led to the exchange of design knowledge among the participants. These general findings are similar to the conclusions made in Keitsch’s (2015) work. However, what differs from Keitsch’s study is the emphasis on the roles of the participants. Keitsch suggests that it is of importance to be aware of the hierarchical structure in the group, since it can affect the discussions during the workshop. However, this issue was not present within this study. Rather, the differences in hierarchies were instead beneficial to the discussions, as they all had different perspectives on design. Designers had a more first person view on how design activities were used in projects, project managers had a holistic understanding of how processes were infused by design, and finally executives had insights into how design affected the organization in terms of strategy, environment and competitive advantage. Furthermore, the participants were all very open and excited to participate in the workshops, and during the discussions they did not seem to feel any pressure to agree with anyone else in the group because of their hierarchical differences.
This may be coincidental or based on the type of organizational culture in each of the visited organizations. A suggestion for future work would be to investigate organizational cultures and structures in relation to the presumed importance of hierarchies.

Another suggestion for future work regarding this study, would be to extend it into a longitudinal one. Even though the game in combination with the workshop was considered useful by the participants, it is still unclear whether or not the workshop was successful in terms of how it supported design maturity in the organization. To investigate this would include conducting follow-up meetings with the organizations to see whether or not any organizational changes have been made since the previous workshop. Evaluating the outcome would arguably provide clearer answers to the research question of how to support organizations in their efforts to mature in design. However, this study was centered around how boundary objects can support organizations in their efforts to mature in design and I would argue that the game by itself can be considered an effective boundary object, as it fulfilled the requirements stated by Carlile (2002).

First, it provided a shared syntax or language for the participants to use by shaping the discussions around the statement cards. While the wording for some of the cards still could be improved in later iterations, the majority of the cards were understood and the discussions were centered around the given topics. Secondly, it provided concrete means for the participants to learn about their differences during the discussion phase. And thirdly, it facilitated a process where the participants could transform their knowledge and apply it to solve problems. The way the participants in the study did this was partially by changing their valued cards at the end of a discussion, but also through the brainstorming session at the end of the workshop. There, the participants used their newfound knowledge about how design was used in the organization, and brainstormed solutions to improve this usage. As such, the
prototype was effective as a boundary object, and facilitated knowledge exchange that has the potential to support organizations in their efforts of maturing in design.

Another interesting aspect to boundary objects are their claimed ability to bridge gaps between different concepts, practices and views. As such, one could argue that boundary objects could potentially help narrowing the identified gap between designers and managers. All of the participants in this study had some form of prior design knowledge or experience with design, even the CEO at ID Kommunikation. What was interesting, however, was that they still exchanged knowledge and explained unfamiliar concepts and terms to one another. It would therefore be increasingly interesting to test the game on an even more diverse group, and include participants with minimum to no prior knowledge about design to see how the boundary object would work then.

5.3.1 A digital boundary object

To combat the scalability issues that were brought to light during the interviews (Katarine, Visma, March 28, 2019), a digital version of the boundary object has begun to take form (see Figure 20). A beta version of this can be viewed on the domain www.designmaturity.se. This domain will be used to test and iterate the digital version in order to either complement or replace the physical boundary object that was developed for this thesis.

In order not to lose the social, discursive aspect and knowledge generation, the tool could incorporate elements from social media platforms or online game mechanics. Exploring the use of this tool could be interesting in terms of researching physical-social vs digital-social interactions. Subsequently, this could lead to interesting questions regarding how social media influenced tools can increase the design maturity in organizations. Furthermore, such a study could raise topical questions such as if and how digital media can be used to socially strengthen organizational cultures.
Figure 19: Digital version of the Design Maturity Assessment Game
6. Conclusion

Increasing the design maturity in organizations is a long process that requires design knowledge, design representatives, an openness to new knowledge and to redesigning existing processes, and clear communication. The process is arguably in and of itself iterative and as such it can require testing many different activities and methodologies in order to find something suitable for a specific organization. It is also important to mention that just because an organization scores high in a design maturity assessment, the organization still needs to work to maintain this level. Furthermore, there are probably additional issues and challenges that the organization might face after having reached a high level. More work is needed in the field of design maturity in order to identify these challenges. Similarly, there could also be more benefits to a high level of design maturity than the ones identified in this thesis. In order to convince management to invest more in design, these benefits need to be clearly justified and validated.

The use of a game as a boundary object to support organizations in design maturity has been evaluated as a potentially useful approach. The prototype for this thesis facilitated discussions and knowledge exchange, as well as knowledge appropriation during the later stages of the workshop. Needed are follow-up meetings with the organizations as well as future assessments to further evaluate the method.
Resources


Appendix

Appendix A: Consent form

MALMÖ UNIVERSITY
Consent form for research participation

This form contains information about the study, how the data is stored, time involvement, information about the use of results, participant rights, and contact information.

Researcher’s name: Emma Larsson
Research title: Leveling Up in Design - Examining the Process of Design Maturity and New Ways to Measure It

Research background
The design discipline of today, inside organizations, have evolved vastly during the past 60-70 years. Design now, is not only concerned with giving form to products. Rather, it has “matured” beyond the borders of aesthetics and has reached strategic-level (and even cultural-level) work, in some organizations. While the process of maturing can be long and challenging, there are several documented benefits for organizations to maturing in design that might be worth the struggle. For example, research shows that design-led companies outperform other organizations in terms of stock value over time1. Furthermore, maturing in design allows for a company to become more human-centered, which ultimately can make people’s lives better - both for the customers and for people working in the organization.2

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In order to measure where companies identify in terms of design maturity, several models have been developed over the past 10 years. One of these models is the DMI Design Value Scorecard (DVS), which identifies the organization’s level of design maturity across three functional areas: design as service, design as connector or integrator, and design as a strategic resource. The model serves as an assessment tool to determine where design currently delivers value and provides a foundation for setting and achieving future design goals. While the model has been proven to do what it says it does, there are no clear instructions of how to actually use the model. This opens up the possibility for interpretation of use, which subsequently allows for the possibility of remediation and redesign of the model.

Research aim
This study examines the process of design maturity for design- or media technology companies, in Malmö, Sweden. The goal of the study is to roughly identify the organization’s level of design maturity using the DVS, gain insights of how these organizations work with design at this current level of design maturity, if and how they plan to level up in design maturity, and if they can identify any issues or challenges within this process. Furthermore, this study aims to gain insights into the experience of using the DVS model, by assessing the model during the interviews with the participants of the study.

Research method
The study is conducted by using a qualitative approach. Individual, semi-structured interviews with participants from the chosen organizations are conducted at the workplace of said organizations. The interviews are audio recorded to ensure that any information given during the interviews are remembered correctly. If the participant chooses not to allow audio recording during the interview, the researcher will take notes instead.

Data storage
The use of any cloud services are, according to the policy of Malmö University, not allowed for storing personal data collected during interviews. The audio files from the interviews are therefore to be stored in a password-protected folder, on the researcher’s computer. Any written documentation that will occur during the interviews will be done on the researchers computer. All the data will be stored in the password-protected folder on the researchers computer until the end of the thesis project, after which the data files will be permanently deleted.

Use of results
The data collected from the interviews will be used in the researchers master thesis, currently titled ‘Leveling Up in Design - Examining the Process of Design Maturity and New Ways to Measure It’. The results will support the research and prototyping stages of the thesis, by providing insights to the process

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3 Please note that the title of the thesis might change during the course of writing the thesis. If the participants are interested in reading the finished thesis after it is published, they can contact the researcher. Contact information can be found on the last page of the form.
of maturing in design as well as the use of the DVS model. The finished thesis will be presented on the 3-4 of June, 2019, at Malmö University.

**Time involvement**
The interviews will take approximately 30-40 minutes (reading and signing the consent form, not included). If the researcher has any questions about the answers given during the interview, the researcher might contact the participant for clarification, until the project has reached its end in June 2019.

**Participants rights**
Participation in this study is voluntary. Participants do not have to answer any question that they do not want to answer. Participants may withdraw from this study at any time, and they will not be penalized in any way for deciding to stop participation. If a participant decides to withdraw from this study, the researchers will ask the participant if the information already collected from them can be used. Participants also have the right to request access to personal information that has been collected from the interviews, at any time. They also have the right to have any errors from the collected information corrected. If the participants find that these rights have been ignored in any way, the participants have the right to lodge a complaint with Datinspektionen. The participant can also contact the Data Collecting Officer at Malmö University for more information and help regarding the collected data.

**Contact information**
Researcher: Emma Larsson
E-mail: contact.emmalarsson@gmail.com
Phone: +46 708 69 18 19

Data Collecting Officer at Malmö University:
E-mail: dataskyddsombud@mau.se

**Consent**
By checking these boxes I agree to the following:

- I allow the researcher to use my name in this study.
- I allow the researcher to use my job title in this study.
- I allow the researcher to use pseudonyms (e.g. “participant 1”) instead of my name in this study.
- I allow the researcher to use the name of the company I work for in this study.
- I allow the researcher to use pseudonyms (e.g. “company 1”) instead of the company’s name in this study.
- I agree for the interview of this study to be audio recorded.
By signing this consent form, I acknowledge that I have read this form and that the research study, as well as my participation in it has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form.

Researcher’s signature:____________________________ Date:_____________________

Researcher’s name (clearly written)________________________________________________

Participant’s signature:____________________________ Date:_____________________

Participant’s name (clearly written)______________________________________________
Appendix B: Statements

These are the statements for the statement cards, used in the workshops as part of the boundary object.

1. **Customer knowledge**
   *This section covers user-centered design and communication - how much you know about your customers and what you do with that information.*

   1. We study the behavior of our clients’ users, which then influences what we produce and how we produce it.
   2. We collect client and user feedback through effective tools and channels.
   3. We do user research on a regular basis, to figure out what the users want and need.
   4. Findings from user research is shared with teams outside of the team that conducted the research.
   5. We stay up to date with current trends on the market and in the industry, that may be relevant to our clients and their customers.
   6. We question our and our clients’ assumptions of what would be the best experience for the users.

2. **Process and execution**
   *This section covers how you work with design practices and processes.*

   1. We ideate and share our opinions before deciding on a solution.
   2. We create prototypes for the things we do so that we quickly can test our concepts.
   3. Prototypes do not need to be pixel perfect.
   4. In a design process, we see to that every step is fully completed before moving on to the next one.
   5. We use multiple kinds of metrics to assess the quality of what we have produced.
   6. We are always proud of what we produce.
   7. During a project designers collaborate with other, non-designer teams and allow them to influence their work.
   8. Designers are asked to do in-house projects with other non-designer teams.

3. **Design support**
   *This section covers how much design methods and processes are supported and encouraged within the organization.*

   1. Designers are given the appropriate amount of time to execute their tasks and projects.
2. Designers are given the appropriate resources and tools to execute their tasks and projects.
3. The environment at work encourages creativity and collaboration.
4. Designers regularly collaborate with other teams or departments.
5. When important decisions are being made, designers are asked to provide their insights.
6. The company trains non-designers in design methods.
7. Design is well-represented in all levels of the organization, including executive management.

4. Competition
This section covers how much design influence your competitive advantage on the market.

1. We concentrate on how we use design to achieve a leading position in the market.
2. We know what financial value design has to our company.
3. Our products and/or services are likely to be recommended to others by our customers.
4. What our sales team and marketing team offer, is exactly what we deliver.
5. Our customers perceive our brand as innovative.
6. Our company values knowledge and expertise in order to gain a better competitive position.

5. Impact
This section covers how your company’s use of design in strategic-level work affects social, cultural or environmental aspects.

1. Our company is interested in exploring new or underserved markets.
2. Our products and services have very low impacts the environment.
3. Our company emphasizes fair and ethical work practices.
4. Our products and services add meaningful value to our customers’ lives, or to the overall business of our business-customers’.
5. Our company is known to support the local community in one way or another.