the strategic importance of reframing

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abstract

Software industry has been expanding and spreading its influence over a huge number of products and services. Parallel to that, the industry as a whole has been more exposed to challenges complicated enough to be faced with simple solutions. Due to its very dynamic nature, based on technological advances, software companies are perhaps one of the most exposed group, creating issues, internal and external, that were not present some time ago. Meanwhile, design has been more recognized as strategic, and for possessing sets of tools and methods to deal differently with problems in comparison to, for example, traditional managers. One of these practices is 'reframing'. Hence, this study aimed to investigate how strategic design may contribute with organizational challenges faced by software companies through the use of reframing. Based on an initial challenge received, a qualitative study inspired by ethnographic methods was conducted, and then Kees Dorst' Frame Creation Model was applied over the findings. The initial challenge was then reframed into a process that should be embraced by the company, instead of generating a single solution. It was concluded that reframing and the Frame Creation Model can be valuable for solving organizational challenge, as much as it is for social challenges, the main area of application of the model. Also, some insights about how designers can act strategically within software companies are revealed (for instance, being a 'bridge' between businesspeople and developers), together with findings about the behavior of the organization. This can serve as inspiration for other companies with similar issues, spreading the possibilities for designers to perform in this field, both as practitioners and as researchers.

Keywords: reframing, frame creation, strategic design, software industry.

preface

The story of this master thesis started with a challenge received from a Swedish software company. As someone that grew up witnessing the development of the personal computer and video game industry, software and its construction always fascinated me somehow, even reaching the point that my journey as a university student first started in a bachelor program of Computer Science (which I never concluded). Despite the fact of giving up of the career as a computer scientist to be a designer, the interest about the software world and its possibilities is still there, and nowadays this knowledge is growing in relevance since software is not anymore confined to a personal computer standing over a desk, or big centers of data information owned by countries. As a business designer, it is interesting to explore how the field of design could cooperate with software companies beyond what is already done in relation to User Interface (UI) and User Experience (UE), thus, to be within a company of this niche seemed to be a very good opportunity to obtain/develop this knowledge.

As explained before, everything started with a challenge, and here it is resumed in few words:

"In our company, the development of software is done by overlapping projects run by many teams, in many different codependent – and independent, areas. In order to identify where in the development plan we are, we need to be able to understand holistically these connections and interdependencies between teams work."

This challenge came together with the question "is this suitable for a master thesis?", which took me some time to be able to provide an answer for due to the complexity of the issue. Hence, the presented problem was only the first of

several layers I had to uncover, for instance there were still the need to understand more about what surrounds the issue, how to approach the challenge, and if this was indeed the proper challenge to tackle, among others. Therefore, this thesis was built over the question exposed, and the next pages contains the exploration and development of this very particular challenge.

table of contents

list of figures

introduction

1

1.1 Background

It is easy to notice that the world is getting more complex, advances in technology are opening new possibilities (Axon, Friedman, & Jordan, 2015), jobs that were stable are disappearing while others unimaginable years ago are being created. Stimulated by the environment, people are also changing and consequently the way they feel and interact changes too. It is possible to exemplify it through the changes that happened in last years in relation to how people consume music: in the 90's one had to have a stereo or a discman and buy CDs to listen to selected music. Nowadays both are not necessary anymore, since having a smartphone, an app to stream music, and a Bluetooth speaker are enough to organize a party.

The growth of the influence exercised by computers and software on our lives is obvious through the example proposed and, considering how much this industry has been expanding, probably it will be even more present in the future. Changes enabled by computer and software industry influenced and provoked modifications in how people behave, react, and interact with products and services. Still using the example of music, when one had limited access to a couple of albums the tendency was to listen to them more often, allowing the brain to get used to that music and giving more chances to artists that, perhaps, did not make a good first impression. Nonetheless, when all the action needed to skip a song or an artist is to press one digital button, why bother in listening to this again? Why push the brain in a quest for the nuances of the song if it is so easy and quick to change for a new option? Behaviors like this culminates in consumers that are more demanding since as soon as they get tired of what they have, they can easily obtain a new experience.

This is, of course, a big challenge for companies in different levels, and software companies are obviously included on this. The offers (it does not matter if they are products or services) will probably be better received by people if they are very 'catchy' and easy to grasp, moreover the need to 'predict' what will be the next 'big thing' in the industry (or to

influence people so much that a new offer can steer behaviors towards the vision predicted by the company) is faster than ever. To be successful in reaching this, companies need to have outstanding employees and to attract them is not that easy, which perhaps is even harder for software companies due to the high number of employment opportunities available for developers. Then, companies need also to consider the well-being of employees, how to captivate and keep them happy to avoid seeing competitors taking important people away. To do it involves a whole new set of actions regarding organizational culture in comparison to some years ago (Axon et al., 2015). Therefore, for organizations to succeed it is not only about designing new products or services anymore, it is about designing new strategies in different levels, and understanding the real problems that should be tackled.

The new level reached by organizational challenges opened the doors for design to be perceived as more than styling/ form-giving by companies: Design, especially through design thinking, started to be understood as a strategic resource with potential to contribute in different stages of the process, not only for the final delivery. Different levels of design's participation within organizations are demonstrated by the design ladder developed by Danish Design Center in 2001 (figure 01). Then, design has been more and more incorporated as strategic by organizations, being promoted from 'the sauce' to one of the core ingredients of the recipe, as said by John Maeda, former MIT professor and president of Rhode Island School of Design, in a social media platform. The designer's mindset, or the 'designerly' way to approach problems, is said to possess a different attitude when compared to what is commonly found in managerial world, demonstrating more curiosity, openness, and willingness to play. These characteristics caught the attention of companies (Dunne, 2018), opening room for strategic design, a discipline that brings design methods to the core of businesses as part of the strategic decisions of organizations. Through this "insertion" within management, it is expected then that designers are able to approach complex problems from different perspectives, recognizing and bringing to the surface different possibilities

of understanding and solving challenges, instead of relying on the more obvious and straightforward ones. One of these possibilities is the practice of reframing to reinterpret challenges, a practice that aims to reach the roots of problems by adopting different perspectives obtained through methods used by designers.

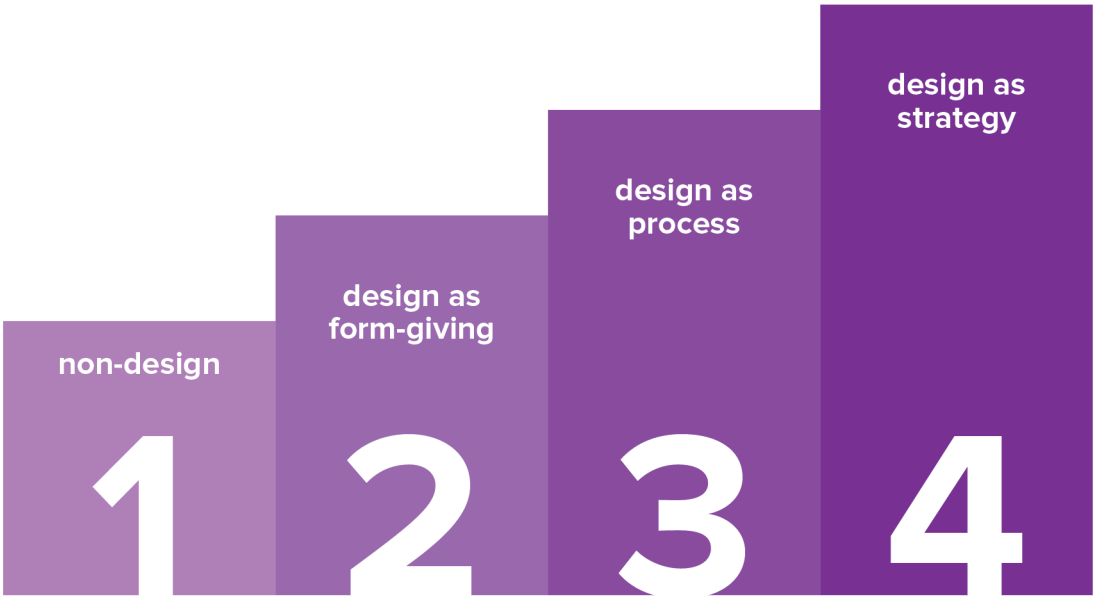

Figure 01: Interpretation of the Design ladder, by Danish Design Center

1.2 Problematization

The dimension of changes on general organizational environments is very broad, ranging from simple (the use of colorful walls and boards with motivational quotes, for instance) until very complex things (like the structure of the business as a whole). Software industry is in the middle of these constant changes since it is very dynamic due to advances in technology, with growing number of competitors, high level of competition for talents, and the need to have a good product in order to beat the competitors.

Meanwhile, design has been increasing its participation and value as strategic within companies, then it is interesting to investigate how and for what it has been utilized. The software industry demonstrated to be a very promising case to embrace strategic design, and since there is many challenges in this field that are not easy to frame (for instance, how to attract and keep employees? Or how to keep an innovative spirit facing the constant evolution of technology?), the practice of reframing can also fit in this context. The literature reveals examples of reframing being used in social contexts, where the challenges usually involves communities and cities (Dorst, 2011; 2015a; 2015b), and in managerial context where the issue involves the interaction between the organization and external actors (Dorst, 2015b; van Leeuwen et al., 2016). However, references demonstrating how strategic design, through the utilization of reframing, can improve internal processes of software companies to generate not only revenues, but also benefits for employees (for instance, feeling of ownership) were not encountered. Therefore, it was decided to explore how reframe can be applied within a software company and how valuable it can be.

This thesis then aims to investigate the following question:

How can strategic design be used to contribute with the reframing of organizational challenges in a software company?

Therefore, this research aspires to understand and foster reflections for the design field, the researcher, and the company studied, about the roles of strategic design and the practice of reframing acting upon internal challenges of software organizations.

1.3 Research context

The story of this master thesis started with a challenge received from a Swedish software company, that will be anonymized in this thesis and receive the fictitious name of Horizon. The challenge received can be resumed by this short quote:

"In our company, the development of software is done by overlapping projects run by many teams, in many different codependent – and independent, areas. In order to identify where in the development plan we are, we need to be able to understand holistically these connections and interdependencies between teams work."

In order to contextualize, information about the company are going to be provided. Horizon has its focus on developing high-end industrial software for its clients, that are normally based in very competitive industries and need to have good products in order to overcome their competitors. The company is co-owned by two other businesses (50% of the ownership for each) from different industries, being officially founded in 2017 and it is almost 2 years old while this thesis is being written. Thus, it is a young company, but even so it can be considered large since it possesses more than 550 permanent employees and some temporary ones. These employees are divided in more than three offices, located in different countries, the Swedish office being the biggest one with around 400 employees.

In relation to the structure, the company is divided in three main sectors: Product, Strategy, and Business Support, however there are few layers separating developers from the CEO, which makes the company to be perceived as a flat organization by most of the employees. The development of projects takes place inside the product sector by several product areas, and few supportive areas. Internally, Horizon is organized in teams, where each team has at least one Product Owner (PO) and one Group Leader (GL), and product and supportive areas also possess one or two Area Product Owner (APO). Nor-

mally people are involved in more than one team, being developers the exception, and some teams are cross-site, which means that part is in one office, and part is in another.

theoretical background

2

In this chapter the theories used to support this thesis will be presented. A briefly introduction about design, concepts of Strategic Design, Reframing, and Frame Creation will be explained, as well as their relevance and contribution to this study.

2.1 Strategic Design

This thesis contributes to the literature on strategic design. As explained previously, the increasing understanding by managers in relation to the strategic qualities of design as part of business decisions provided an impulse for strategic design. Therefore, this discipline will be discussed, starting with its definition and then contribution.

2.1.1 Design background

Design has been present and constantly evolving throughout the human history. What started as an activity to improve basic tools in the humans' quest for surviving changed into an activity capable of creating completely new outcomes, and influencing the habits and behaviors of people due to that. The Industrial Revolution and the mass production were important milestones for design, expanding the reach and changing the practice considerably. The use of machines, new materials, and the increasing division of labor were some of the factors that ended up in the separation between design and manufacture, instead of concentrating the whole development in the hands of only one craftsman (Bürdek, 2005; Heskett, 2005). The development of design from industrial revolution until today is explained by Buchanan in his 'four orders of design' (figure 02). Buchanan (2001; 2015) argues that the first order started in the beginning of the 20th century, with the introduction of graphic design as we understand it today. It first started addressing mass communication issues, used to create symbols and graphic works to convey information, initially intended for printed publications. In the same period, industrial design was born, aiming to develop physical artifacts for mass production, raising the production

of factories and cooperating to change the relation between people and objects, meaning that it influenced how people consume goods.

	Symbols	Things	Action	Thought
Symbols	**Graphic design**			
Things		**Industrial design**		
Action			**Interaction design**	
Thought				**Environmental design**

Figure 02: Four orders of design

Around the middle of 20th century, the third order spread design's activities to new practices, going beyond symbols and products. One of these new practices was focused on interactions between humans and products, having a more prominent beginning with interface design and then moving to interaction design. The other practice was service design, exceeding the tactility often present in other practices, focusing more on the experiences that affects the interactions between humans and service providers. The third order opened more possibilities for design, facilitating the entrance in governments and non-governmental institutions, adding to the field possibilities to work directly with the society. The fourth and last order of design focus on systems, environments, and organizations. Other orders coexist within this one, and the purpose for this is to understand what is behind complex systems, what they entails, how they relate with human systems, and what experience they generate for people.

Wicked problems

It is noticeable in the four orders that the level of complexity of the challenges progresses while it moves towards the fourth order. Challenges to deal with systems or with organizations are difficult, or even impossible, to address with a simple and straightforward solution, therefore due to their extreme complexities these issues are classified as 'wicked problems'. Problems classified as 'wicked' have some special traits: they are difficult to formulate; cannot be solved with a simple solution; do not have clear indications of how to solve or when they can be considered finished; possess stakeholders with different views; are unique on their essence (which means that a wicked problem cannot be equal to another one), among others (Rittel & Webber, 1973).

The concept of wicked problems was firstly described as an ideal approach to highly complex social challenges (e.g. climate challenge, or poverty) that cannot be tackled through a classical scientific method (like methods utilized to solve a mathematical problem, for instance), however due to the increasing complexity of the world, wicked problems are appearing more often within organizations too. According to Camillus (2008), companies are understanding that traditional strategic-planning techniques commonly adopted are not enough for the nature of the challenges they have been facing, which in fact are wicked problems.

Nonetheless, for designers wicked problems are not so exotic, since they often face challenges with similar configuration and nature (Buchanan, 1992). Designers have to "conceive and plan what does not yet exist" (Buchanan, 1992, p.17), this is by nature a wicked problem, and to reach solutions designers use sets of methods and approaches that are quite unique, as examples it is possible to say the addition of stakeholders and users to the process, acceptance of ambiguity, and the embrace of risks (Kolko, 2015). The fourth order of design focus in understanding systems, environments, and organizations in relation to humans, it is already said that wicked problems are being more and more spotted within or-

ganizations and their environments, and design has tools to deal with this complexity. Consequently, new fields of design were developed, among them is strategic design.

2.1.2 Definition

Different authors generated several definitions of design, also a representative number of fields inside design were developed through the years (e.g. industrial design, graphic design, service design, user experience design, among others), which creates difficulties to have a clear definition that suits them all. The purpose of this thesis is not to define design, even so it is important to have a grounding for the forthcoming stages, thus the definition of design described by Simon (1996) was adopted: "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones" (Simon, 1996, p.111).

The skills that designers possess to devise courses of action are well-known, design itself as an operational function (e.g. utilized as form giving or styling) has a very good reputation and it is well-established in many industries. Nevertheless, organizations are increasingly recognizing that design has potential to go beyond its traditional use and contribute in the business context, assuming a strategic role (Topaloğlu & Er, 2017; Stevens & Moultrie, 2007) instead of being relegated only to the operational part of the process. The sum of these contributions of design to business received in the literature the name of 'strategic design' (Stevens & Moultrie, 2007).

Just like what has happened with design, several authors provide different definitions for strategic design. Stevens (2009) says that strategic design is "the effective use of design to improve and maintain performance in business or non-profit organizations" (p.XIV). Similarly, Calabretta, Gemser & Karpen (2016) defend that the term strategic design "refers to the professional field in which designers use their principles, tools and methods to influence strategic decision-making within an organization" (p.9). The authors also state that

to be truly strategic, design should permeate the company culture, guiding not only decisions, but also practices and behaviors.

Freire (2017) propose that "strategic design is a process for creating strategies that generate value for the different actors of a creative ecosystem" (p.92), where 'ecosystem' can be understood as "social organisms in constant relation, with modes of organization with complex nature and dynamics, capable of setting up to survive over time" (p.92). In a similar understanding, Meroni (2008) perceives strategic design as "an approach to problem setting and solving and thus to design decisions in turbulent and uncertain contexts" (p.37), but her argument is broader, stating that strategic design can generate benefits for any kind of organization (public, private, non-profitable, etc.). Freire (2017) also argues that in contexts where complex thinking, uncertainty and interdependencies are more present, strategic design has an important role not only as a 'problem-solver', but also as a 'problem-setting'. This "problematizing vision of the world" (p.92) can benefit businesses when it comes to interpret contexts and recognize aspects arising in different areas (for instance, society, and economy), that can affect the organizations (Freire, 2017).

2.1.3 The contributions of strategic design

Strategic design involves complex interactions of stakeholders and can make significant contributions beyond those visible to customers, nonetheless it might not be clearly perceived within an organization (Stevens, 2011), raising questions over its usefulness and causing it to be underrated sometimes. Lorenz (1994) recognized the strategic importance of the designer for organizations, defending that designers can be the ones who anticipate movements in industries, and also act as 'bridges', both internally (among marketing and engineering, for instance) and externally (e.g. connecting customer's behavior with new technology) of organizations. In this context, Lorenz (1994), in consonance with Calabretta, Gemser & Karpen (2016), says that to reach the full potential

strategic design should permeate an organization. In order to enter the core of organizations, to use design thinking as 'a business card' is probably the easiest option, since it has been spreading in managerial books and magazines over past years.

Design thinking is "a systematic approach to problem solving" (Liedtka & Ogilvie, 2011, p.4) extensively used by designers and that has been attracting the attention of managers due to its potential to create processes of innovation inside organizations. Design thinking can add valuable tools (e.g. scenario planning, and visualization), and approaches (e.g. bring stakeholders to take part in the process; and to embrace the unknown and uncertainty as part of the journey) to the organization's toolkit that are seldom adopted by professionals not familiarized with the process (i.e. not designers). Liedtka & Ogilvie (2011) state that learning the basics about design thinking makes anyone appreciate more what designers do, then if the authors are correct design thinking can be the access point for strategic designers to reach the core of organizations. Once there, strategic design can establish itself and demonstrate its value, for instance bringing to organizations the capacity of adapting and evolving the strategy, consequently increasing the possibilities to keep the business sustainable in the long-term (Freire, 2017, p.92). Also, the capability of design to promote dialogue and cooperation is fundamental to find new paths, new meanings, and generate knowledge to organizations, enabling strategic design to be considered "a process of social learning (...) capable of fostering changes in the culture of organizations and society" (Freire, 2017, p.92).

Strategic design is future oriented, consequently it is connected to innovation, a topic that businesses commonly explore in order to 'stand out in the crowd' and obtain advantages, normally economic or social. However, investments on innovation do not necessarily mean more profit for organizations, which happens because the innovation process sometimes is unstructured, fragmented, and far from understanding what customers need and/or want (de Moura & Adler,

2011). Therefore, organizations would potentially benefit of a more structured approach to innovation, one that considers internal and external factors, and uses methods to orchestrate all the elements that compound the scenario while foster the process to be established as a culture. In this scenario, Strategic Design has a central role, providing support and structure to the innovation process while connecting "unarticulated human needs to solutions that (...) can add value to users and bring profit to the firm in a sustainable way – environmentally, socially, economically, and institutionally" (de Moura & Adler, 2011, p.116).

In a nutshell, strategic design is the use of design methods applied to strategic decisions that impact the future of organizations in several levels, including stakeholders and the environment. It is especially valuable in complex and uncertain scenarios, and it should be inherent in organizations to reach its full potential (i.e. merge with the culture). It can orchestrate innovation through a structured approach, making connections within and outside businesses, and fostering the cooperation. The main strength of strategic design relies on how designers deal with challenges, using an extensive set of tools (e.g. the ones found in design thinking) and approaches not commonly addressed by traditional managers. 'Reframing' can be mentioned as an example of an approach used by designers and connected to innovation.

2.2 Framing and Reframing

2.2.1 Definition

The previous discussion about wicked problems clarified how complex are challenges of this nature, and due to this it is not likely that issues fitting into that description can be tackled without some kind of 'constraint', then there is the necessity of transforming wicked problems in something more graspable. Reframing, thus, can facilitate this transformation. 'Reframing' means a perspective added to a problem, a process to shape a challenge repositioning it in a situation

where it can be tackled (Buchanan, 1992; Kolko, 2010; Dorst, 2011). Frames, used as tools, are complex and mix different elements in order to be constructed. Among these elements it is possible to include the need to identify the views of all stakeholders and actors, the issues which concern them (Buchanan, 1992), and "the specific perception of a problem situation, the (implicit) adoption of certain concepts to describe the situation, a 'working principle' that underpins a solution" (Dorst, 2011, p.525).

When the problem is completely indeterminate, it can be argued that a frame is needed. However, it is more common to find challenges pre-determined, previously framed or at least with expectations to achieve a specific result. According to Buchanan (1992), all problems can be considered 'wicked' at some stages, except the very basic ones or the ones where someone else already removed the 'wickedness' of the issue. In these cases, where the problem was framed previously, it is important to investigate, interview stakeholders, and analyze further the research questions (Patnaik & Becker, 1999, p.42). Doing this one can evaluate how accurate the initial frame was, if it was well constructed (and narrow enough), and check if every detail was considered, which perhaps can uncover issues that were not taken into consideration and were unanticipated before. Facing the confirmation of an inaccurate frame, the scenario then points to a reframing of the initial problem.

2.2.2 The relevance of reframing a problem

Schön (1985) discusses that educators and professionals realized the importance of "indeterminate zones of practice" (p.5) instead of only considering the more rigorous and technical skills, and turn their attention to "dilemmas of practice under conditions of complexity, uncertainty, and uniqueness" (p.5), bringing more awareness to problem-setting and not only to problem-solving. The author explains that to solve wicked problems, competent practitioners go beyond technical solutions through the use of 'non-rigorous skills', like problem-setting. The use of these skills is what enables

the challenge to be later solved through a technical problem-solving approach. Schön considers non-rigorous skills as “the most important components of a competent practice” (Schön, 1985, p.16) and essential skills not only for the most challenging and relevant problems, but also for any work in the real world. This is said due to the fact that real-world problems tend to be wicked and indeterminate, which makes them difficult to be approached using practices that rely one well-formed problems to be successful. A problem focused on where to build a road, for instance, cannot be approached only with technical solutions. It is a complex situation where the professional should consider a broader spectrum of factors, including several stakeholders, politics, finances, and geography (Schön, 1985).

The search for the right problem is therefore crucial to solve most issues, and for designers it is as important as to generate solutions, just as the Double Diamond model (figure 03) clarifies. The model created by the Design Council in 2005 is composed, as the name states, by two ‘diamonds’ in order to represent the design process, where the first aims to investigate what is the real challenge to ‘design the right thing’, while the second target to ‘design things right’ and generate accurate solutions. Attributing 50% of the whole design process to problem-setting is a very compelling way to demonstrate the relevance of focusing on problem-setting, and perhaps it is even possible to argue that its relevance go beyond the 50% of its share: a good problem-setting comes before a good solution, making this part totally dependent on the first. Moreover, when a solution fails but the problem is correctly defined, just to go back some steps and try again can generate a successful solution. However, if the problem-setting is not precise then probably it would be needed to go back to the very beginning, spending more time and resources to reach a suitable and effective solution. As stated in the Design Council’s website, “One of the greatest mistakes is to omit the left-hand diamond and end up solving the wrong problem.” (Design Council, 2015)

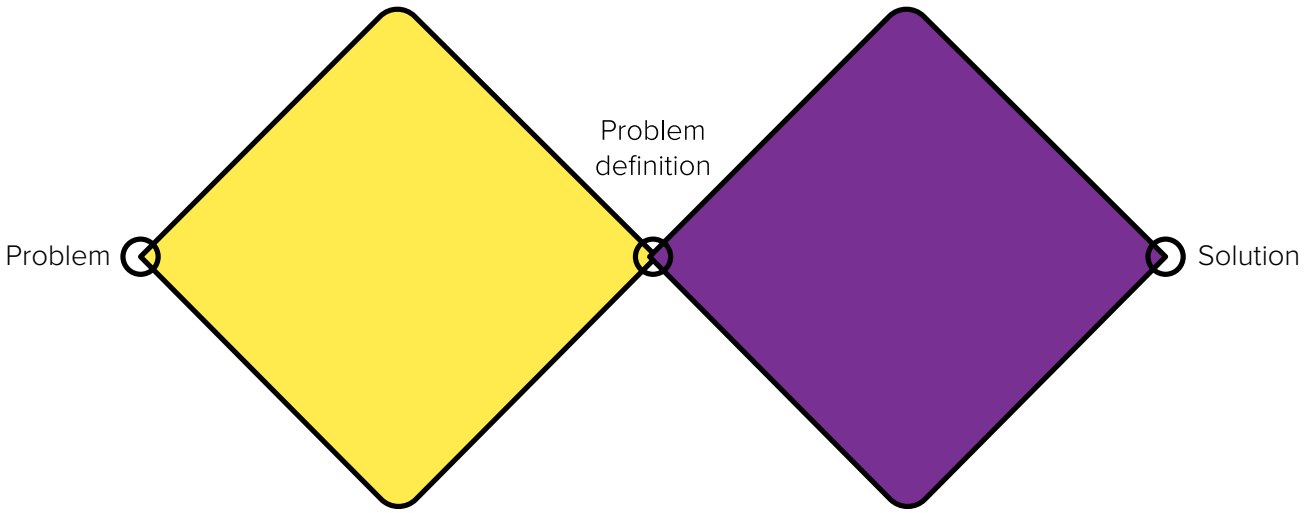

Figure 03: Double Diamond simplified

2.2.3 Frame creation as a core practice of Design

People with different backgrounds approach problems differently, based on the set of tools and skills they developed and learn. Liedtka & Ogilvie (2011) exemplify it comparing how MBA students and Design students would approach differently the same challenge: In short, while MBA students would tackle the issue more objectively and rationally, researching trends, reading reports, benchmarking, and delivering a complete report (or PowerPoint presentation) including Return Over Investments (ROI) and Net Present Value (NPV), Design students would do it very differently. They would probably approach it considering the market, but in a more human oriented perspective. It means not only trend research, but fieldwork too, considering the human experience, creating scenarios, interviewing people, inviting others to co-create in sessions of brainstorming, and in the end the delivery would probably be in the form of concepts to be prototyped. As the authors concluded, “these obvious differences in framing, data gathering, and output signal more fundamental differences in the core assumptions and decision drivers underlying each approach” (Liedtka & Ogilvie, 2011, p.10).

As Dorst (2015a) explains, framing is a practice adopted by expert designers, and companies are now understanding it as being very valuable, or even crucial, for solving organizational problems. It is getting clearer for organizations that wicked problems are part of the world nowadays, and it is not likely that these challenges can be approached successfully in a more traditional way, they should be tackled alternatively, and the design practice of problem framing can be valuable in this context (Dorst, 2015a).

The way people decide to tackle challenges is based on four basic reasoning patterns used to approach problem solving, and the 'knows' and 'unknowns' of a situation are determinant to define which one will be used. The roots of reframing lies in the design abduction, an approach that is in the central challenge of design (Dorst, 2015a), but before explaining about abduction and its ramifications, it is needed to discuss about deduction and induction, the more classic patterns. Dorst (2011; 2015b) utilizes a simple equation to explain the influences of the 'knows' and 'unknowns' in the definition of which reasoning pattern will be used. Below is the equation proposed by him.

WHAT (a "thing") + HOW (a working principle) leads to RESULT (observed).

Dorst (2011) explains that this equation can be applied in different situations. When it is used with Deduction, the missing piece is the RESULT, however since one knows the 'thing' and what is its working principle, it is possible to predict what will happen. To illustrate, the author utilized the phenomena of movement of stars, thus in the end it is:

WHAT (for instance, stars in the sky) + HOW (due to natural laws) leads to ???? (a movement that can easily be deducted).

When approached with Induction, the missing part is the HOW, which means that one knows WHAT (again, stars in the sky) and the RESULT (the movement), but does not

know HOW it happens, then it is possible to test hypothesis and make discoveries about the phenomenon.

WHAT + ???? leads to observed RESULT

These are the more traditional scientific approaches, basic reasonings over problem-solving. However, when the goal is to create value the equation changes: "the end now is not a statement of fact, but the attainment of a certain 'value'" (p.523).

WHAT (a "thing") + HOW (a working principle) leads to VALUE (aspired)

Abduction is the basic reasoning pattern in productive thinking, and it can be divided in two forms, where the first (normal abduction) is more similar to the reasonings in problem-solving, since one knows the VALUE expected and HOW to reach this value, yet the WHAT is missing. In terms of the equation, the 'normal abduction' can be manifested like this:

???? + HOW leads to VALUE

The second form, 'Design abduction' is different though, and more complex. This is a more open form that provides only one information, that is the VALUE one wants to achieve.

???? + ???? leads to VALUE

Since both WHAT and HOW are missing there is the necessity of pursuing them, but the lack of a more established grounding conducts one to a more explorative and less conventional practices. This is where, according to Dorst (2011), a frame needs to be applied. Following the logic of the previous equation, "a frame is the general implication that by applying a certain working principle we will create a specific value." (Dorst, 2011, p.524).

WHAT + HOW _____frame_____ RESULT

Design abduction, thus, is to approach a challenge from the outcome (or values, consequences, or simply the only "know" in the equation), and go back to the HOW and WHY, adopting or creating a frame for the situation (Dorst, 2015a). One example of design abduction is the hypothetical situation of a hospital dealing with an excessive number of patients in relation to the rooms available. In this case, if it is diagnosed that the offer of rooms is constantly lower than the demand for rooms, instead of being an isolated fact, an action should be taken in order to rebalance the ratio between patients and rooms. The first insight is that the hospital should provide more rooms for the patients in order to provide adequate treatment, however it is clear that the value does not lie in the rooms, but in the treatment itself. Then, the equation would be like this:

???? + ???? = VALUE (provide treatment for every patient)

There is no clear WHAT or HOW for this challenge, and it is clearly a wicked problem due to its complexity and number of stakeholders involved, nonetheless there is two obvious solutions for this case: to build another hospital, or expand the size of the current one and hire more health care related professionals, like physicians and nurses. Yet it is important to realize how much time and resources are needed to build and maintain another hospital and more staff, and if it is decided to expand the existent one there is also the problem of moving patients to another hospital (maybe in another city) during the construction. However, as explained before, the value is not in having more rooms, but in making sure that every patient receives an adequate treatment, which open the doors to a reframing of the challenge. The focus can be changed from reaction to action, and an investigation to understand why there is so many patients in the hospital can be organized. Let us suppose that the investigation reveals that many patients enter the hospital due to traffic accidents, then a new investigation can be conducted to discover in what streets the majority of accidents take place and if there are patterns among them. Knowing the roots of the issue allow different actions to be made. In the end, some intervention

in the more dangerous streets, or a program to influence the behavior of drivers, can reduce the number of patients in the hospital, consequently restoring the balance and ending the necessity of constructing more rooms.

The example provided clarifies how reframing can be strategic for an organization, but it demands a 'designerly' approach since "framing is the key to design abduction" (Dorst, 2015a, p.25). Dorst argues that the thinking of design professions is different from fields that are predominantly based on analysis and problem-solving, that are mainly centered on the reasonings of deduction, induction, and normal abduction. Thus, the design abduction is one big factor of differentiation between the design practice from other disciplines, but it is not the only one. Among these differences Dorst (2015b) cites the expansion of the initial concept frame through the use of design process and imagination to reach a definition, the use of experiments and simulation techniques (like scenarios, for example), and the designing of social interactions that carry everyone to an agreement towards a new direction.

2.3 Frame Creation Model

As discussed previously, to reframe a problem is a way to explore it further, searching for different points of view to escape from the initial constraint proposed. Analyzing the challenge initially received for this master thesis, it had only a desired outcome, but there were no 'what' or 'how' to be followed. This configuration classified it to be approached through design abduction in order to reframe the challenge received. Some literatures that deliver frameworks or tools that involves the practice of reframing were found (Hey, Joyce, & Beckman, 2007; Stompff, Smulders, & Henze, 2016; Zhao, Li, & Zhao, 2019), however they are less focused in generating frames, less generic, and not so detailed in the step-by-step process as the Frame Creation Model. Hence, Dorst's Frame Creation Model (Dorst, 2015a; 2015b) was chosen for this thesis. This model is divided in 9 steps (as shown in the figure 04) that are briefly explained below.

Figure 04: Nine steps of Frame Creation Model

Step 1: Archaeology

The archaeology step consists of investigating the problem owner, the problem itself in depth, and also what efforts were made in the past to tackle the same proposed challenge. It is important to understand what other paths could have been taken in the past, why they were not selected, and what kind of results would be possible to be achieved through different paths. This moment of research can be very demanding; however, it generates basis for the project that can be handy not only in this step, but also in others ahead.

Step 2: Paradox

The big question here, as Dorst (2015b) says, is "what makes this problem hard to solve?" (p.74). In this step it is important to find the core of the problem (among several issues that compose the challenge) that prevents the problem owner from advancing. The author suggests the use of 'because'

statements, like in the example that follows:
"Because the Sydney Opera House is such a special place and iconic building, it attracts protesters who seek attention.

Because these protests need to be prevented, the podium section is closed off for everybody.

Because the podium section is closed off for everybody, the Sydney Opera House cannot be fully experienced as a special place" (Dorst, 2015b, p.82).

Step 3: Context

In this stage the goal is to investigate the inner circle of the key stakeholders involved in the problem situation, how they relate with the challenge, how it affects them, and what are their practices to deal with the issue.

Step 4: Field

This step is the moment to go broader and consider not only the key stakeholders, but every player that are connected (or can be connected) with the problem or the solution at some point. Dorst (2015b) explains that while mapping the field it is needed to concentrate on players ""currency," power, interests, values, and in particular the practices and frames they bring that could push the problem in a new direction" (p.77). The author also suggests that the exploration should focus on deeper and universal values that can help with the formulation of themes.

Step 5: Themes

To find the themes, Dorst (2015b) suggests to "identify and seek to understand the deeper factors that underlie the needs, motivation, and experiences of the "players" (p.77). The objective of the theme analysis is to obtain 'universals', that are defined as "a selection of themes that are relevant to the problem situation on the deeper level at which players in

the field have much in common" (p.77). These themes are commonly hidden, being hard to bring them to light, but at the same time it is essential for frame creation to have them exposed.

Step 6: Frames

Frames are based on the themes developed previously. Dorst (2015b) define frame as "an organizational principle or a coherent set of statements that are useful to think with" (p.63), and explains that a frame should be 'actionable' (capable of leading to realistic solutions). Also, a frame has to be 'inspiring and captivating', evoking mental images, generating solutions, and helping the people involved to use it as a "guide for their own mental structuring of the situation" (p.64). A frame can be inserted in the following formula:

If the problem situation is approached as if it is … , *then* … (Dorst, 2015b, p.78)

To exemplify, it should be like the example below:

If the problem situation of the Opera House podium is approached as if it is a problem of providing liveliness and rejuvenation, then the podium should be … (Dorst, 2015b, p.84)

The author explains that frames are totally static concepts, they are tools and "whether some metaphor or pattern of relationships can be called a "frame" is completely defined by its use" (p.65). Thus, it is more interesting to ask, "when something is a frame?" than "what is in a frame?".

Step 7: Futures

This step is a process of "thinking forward", where the goal is to create scenarios to test the frames and check if any of them can lead to viable solutions. The ideas are tested to check if they can guide to a promising direction, allowing the generation of many solutions or not. Simultaneously with the development of new ideas it is needed to bring to surface new

value propositions for the participants involved. Just like frames, solutions also has to spawn interest and commitment in the players that are needed for the implementation (Dorst, 2015b).

Step 8: Transformation

This is the moment to evaluate the ideas developed previously and check which ones are feasible to be executed. Ideas here are deeply explored to have a clear picture if changes are needed on them, and what changes are needed in the problem owner in order to create a good 'marriage' between organization and solution. Besides, this is also the moment to discard ideas that are impracticable or do not possess a good cost and benefit ratio, despite how great they seem to be.
Ideally, "this step results in a "business plan" accompanied by a transformation agenda and a strategy for achieving results" (Dorst, 2015b, p.79). The strategy generated is usually divided in short-term components (to be applied quickly in the organization as it is in the moment) and long-term components (that requires complex changes in the practices of one or more stakeholders).

Step 9: Integration

The final step is the moment to make sure that the new frames and solutions are going to be successfully integrated in the broader context of the problem owner (being one or more than one). Also, the new frames may have generated new opportunities that can be explored by the organization in terms of network or even new projects, and the integration is a possibility for the organizations to add the new skills and discoveries as active knowledge, incorporating as tools for the future (Dorst, 2015a; 2015b).

2.3.1 The principles of frame creation

The frame creation model proposed by Dorst is very solid and indeed useful, the division in nine steps makes it easier

to follow and graspable, while provides a good understanding of the whole. However, as Dorst (2015b) points out, “a disadvantage of this process model is that it looks deceptively linear” (p.99) when in the reality the process is intertwined, and the different steps often interacts among each other. The author recognizes the need for flexibility in frame creation, explaining that the starting point can be at any of the steps and it should be defined by the challenge to be accomplished (Dorst, 2015b).

This is good for practitioners, scholars, and anyone else who wants to utilize this model, since there is no need to feel ‘locked’ when the author himself encourages people to approach the frame creation model based on its principles, not on its steps. The ten principles, or ‘golden rules’, are divided in three ch unks: the first four determine the frame creation approach to problem-solving. The following three, according to the author, “describe what “quality” is in the most important frame creation stages” (p.100), and the last three principles are related to strategies for the implementation of frame creation (Dorst, 2015b). Therefore, the 10 golden rules (figure 05) are briefly explained:

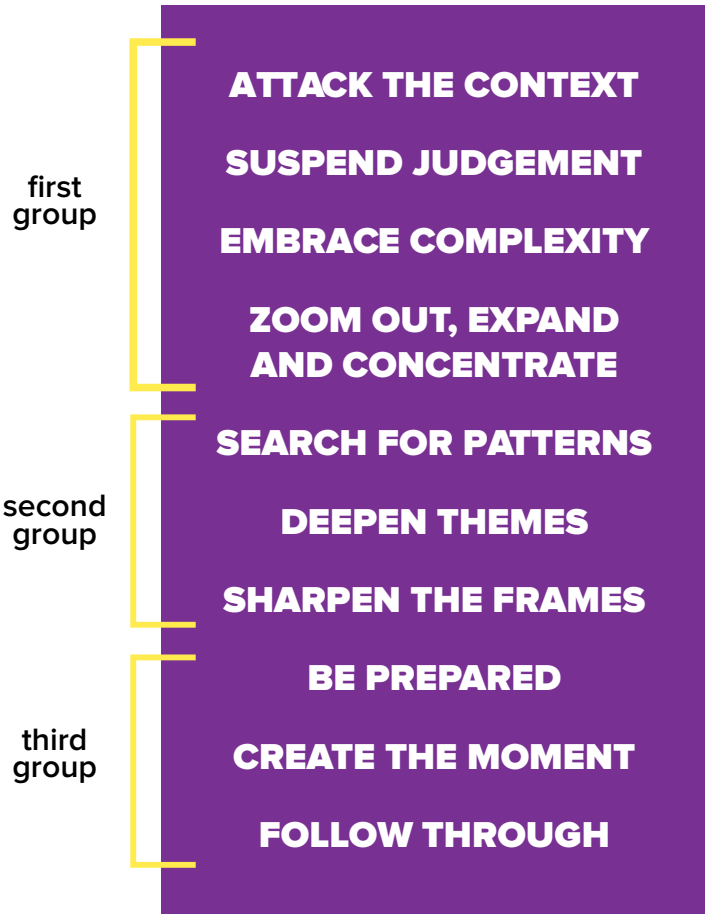

Figure 05: Golden rules of Frame Creation Model

Attack the context

Wicked problems can seldom be solved as they are presented, which means that it is highly recommended to investigate them deeply in order to reach their specific context and true roots. The context "needs to be critically appraised and altered before the problem itself can be attacked" (p.100), then is possible to go beyond the symptoms and reach the core of the challenge (Dorst, 2015b).

Suspend judgement

The name of the principle is more than a hint in this case. According to Dorst (2015b), to criticize the former actions of the problem owner and other stakeholders is not part of frame creation. The investigator should just take the information as given and work with or around them. The judgement is only well received in the last steps of the process, when it is aimed at new frames, solutions, and value propositions. As the author states, "the deferral of judgment and preservation of ambiguity are precious qualities of the frame creation process" (Dorst, 2015b, p.102).

Embrace complexity

Through frame creation the initial simplification of a problem is questioned, and the complexity of the problem is what the process brings to light. The goal is exactly to question what is considered correct in the beginning of the problem solving and expose the complex and rich part that were hidden below the initial simplification. Even not possessing a formula that can solve all the issues, the process does helps the proponent providing "a distinction between diverse layers of context, which limits the number of elements and relationships that need to be kept in mind at any one time" (Dorst, 2015b, p.103). Thus, similarly with other design models (e.g. Double Diamond), the frame creation initially expands the problem situation before converging to a solution.

Zoom out, expand, and concentrate

As previously explained, there is some movement in the frame creation process, since it expands and converges in different stages. The first expansion (or zooming out) explores the players involved in the problem situation and how was the interaction between them and the challenge. Then, the second expansion is toward the wider field, classified by Dorst as a change from "the study of the behavior patterns of stakeholders into the realm of speculative thought" (p.104). The speculation goes around who will be involved with the issue and how these players will interact and understand it. Also, speculations facilitate the creation of common themes, that are the grounding for the development of "new frames for the problem situation, leading to proposed actions that can be critically appraised" (Dorst, 2015b, p.104). Therefore, the model of nine steps explained before is demonstrated by the author as "two sets of nested circles" (p.105), as shown in figure 06.

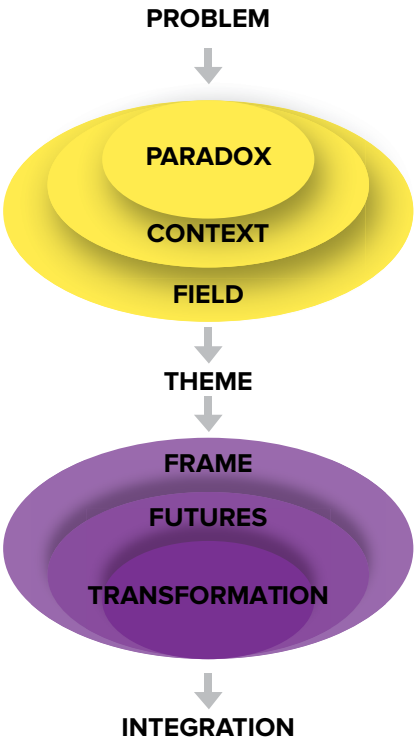

Figure 06: Divergent and convergent phases of Frame Creation Model

Search for patterns

Being a practice based on recognizing patterns, it is important to focus more on what the players do instead of opinions or theories that they might have about the subject of the study. According to Dorst, “is the patterns of behaviors that are key” (Dorst, 2015b, p.104).

Deepen themes

Themes are one of the most relevant steps to determine how good the result will be, then it is very important to have a deep understanding of the themes developed and explored. Dorst argues that a deeply understanding about the themes can generate improvements not only for the following steps of the frame creation process, but also for the identity, flexibility in dealing with the environment, and core philosophy of the organization. Therefore, the themes generated from the expanded problem shall be exposed to an extensive examination that “can be supported by the extensive methodology that can be found in hermeneutic phenomenology, by design-based practices, and by the analysis of the “history of ideas” around a theme” (Dorst, 2015b, p.105).

Sharpen the frames

Narrow and well-grounded frames have more chances of suggesting actions for the following steps of frame creation. Thus, they should be polished and improved as far as possible to create clear pictures for the stakeholders. A good possibility to reach this ideal level of quality for the frames might be combining different ideas (e.g. mixing themes or blending different frames).

Be prepared

This principle reflects the fact that one should be ready to face a frame creation process, then it discusses of what could be done before the process start. The problem shall be analyzed in order to understand if it is a case for using frame creation.

If the result is positive, then it is expected a broad research involving people from different positions inside the problem owner. The goal is to have a complete overview of the problem situation, being this an essential part of the archaeology of the problem situation. Dorst suggests that this activity can be understood as a 'map-making' of the whole situation, and the map itself can be part of the deliverables since they are useful for the organizations outside the specific project too.

Create the moment

In this principle, the team reunite in a frame creation workshop, where a facilitator guides the team through the frame creation steps. Since this process is based on the information collected but also on the participants' experience, it is easier to go broader and deeper with a diverse group. Thus, it is important to be selective and strategic when choosing the participants for the group.

Follow through

Centered in the implementation, this principle suggests that after the whole frame creation process, the proponents should work deeper into themes, frames, and explore more options of solutions, to then compare against the previous one. This principle is supposed to end up in a delivery of an extensive report and series of consultancies, where the implementation should take place. According to Dorst, it is needed to support the problem owner mainly due to the difficulties that the adoption of the new frames can bring to an organization more used to traditional problem-solving approaches.

2.3.2 How Frame Creation Model has been used

Several authors quote Dorst's work as reference when discussing about reframing or frame creation, however this number is not that high in relation to the number of examples from different authors adopting the Frame Creation Model.

There is not a large body of application of Frame Creation Model described on the literature yet, and the examples found are not very diverse in terms of scope or field of application. The majority of examples found are applications on the field of social design, and within this group it is possible to say that mostly come from Designing Out Crime (DOC) research centre, located in the University of Technology, Sydney (UTS). Frame Creation Model is in the core of the approach used by DOC, however it is only part of it, being the full framework composed by other steps too (Watson, 2013; Dorst, 2015b). According to Dorst (2015b), in DOC projects normally Frame Creation Model is tackled in a workshop session, where the nine steps are followed by designers and stakeholders. Nonetheless, it is not exactly mandatory, as it is possible to see in the work by Lulham and Kaldor (2013), one of the few academic sources found where Dorst's model is applied in a project involving a private company. In this paper, the authors applied the Frame Creation Model in 13-week course, together with three master students, and the client was a department store.

Wenngren, Ericson, and Holmqvist (2014) tested the Frame Creation Model in academic settings, utilizing two groups of students to understand how framing and reframing can contribute to determine the constraints of design problems. However, the model was mixed with another process, and the steps were not exposed clearly, making it a bit vague to evaluate. Still in academic environment, Gray (2019) utilized Frame Creation Model as the groundings for a workshop with students, where the goal was to understands how design students deal with reframing and ethics in these outcomes. As a result, the author stated that students demonstrated evolution in their skills of reframing a problem, however he reserved critics to the second stage of the framework, the paradox: "Students were forced to recognize their own limits in digesting complex information and using paradoxes as generative 'jumping off' points, often resulting in reductionist problem frames that removed vital constraints from consideration." (Gray, 2019).

Huh (2016) also criticizes the second stage of Frame Creation, paradox, arguing that it does not offer a logical way to deal with this step, asking “what is a logical principle behind the interplay among complex meanings?” (p.47). The argument defended by the author is that if design reasoning is not random, then it should have a logic behind it to deal with paradoxes. Also, the process of understanding complex paradoxes and reframing is difficult for novices, being a practice natural for expert designer. Thus, a logical approach could make it easier for novice designers to use Frame Creation Model to deal with complex problems.

Frame Creation Model is evaluated by Wendt (2016) as more rigorous than the traditional design thinking, that was ‘popularized’ in order to have more commercial acceptance. The author bears his opinion stating that Frame Creation Model “refuses to decontextualize design decisions from their complex environments, choosing instead to take the necessary time and effort to understand both internal and external contexts in effort to integrate design solutions into them ethically and responsibly.” (p.12).

methodology

3

3.1 Research approach

There are different approaches for one to choose in order to conduct a research, for example quantitative, qualitative, or mixed methods. In order to fulfill the goal of this thesis, the perceptions of employees need to be uncovered. Additionally, their experiences and points of view need to be unveiled, therefore pointing towards a qualitative research.

Creswell (2014) explains qualitative research as "an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem"(p.4), then "in this situation, the researcher seeks to establish the meaning of a phenomenon from the views of participants" (p.19). Thus, qualitative research involves the collection of data (commonly obtained from emerging questions and procedures, and from the participant's setting), and data analysis, to make sense of the information gathered (Creswell, 2014).

To decide what approach is the most adequate, the researcher should take into consideration several factors, like the research design; specific methods of data collection; analysis; interpretations; the nature of the research problem; the researchers' personal experiences; and the audiences for the study (Creswell, 2014). Therefore, considering the nature of this thesis, its research problem, and my personal experiences, a qualitative approach inspired by ethnographic studies was adopted.

3.2 Research methods

3.2.1 Interviews

According to the challenge approached by this thesis, to be in contact with people at the company studied and to listen to their voices are definitely good ideas, therefore it was decided to do interviews. Fetterman (2010) point out the great relevance of interviews as a data-gathering technique, and Cook & Crang (2007) conveyed a similar opinion, explaining that

interviewing has been, together with participant observation, "a primary means through which ethnographic researchers have attempted to get to grips with the contexts and contents of different people's everyday social, cultural, political and economic lives" (p.60).

Interviews can be approached in different ways, and it is part of the researcher's work to know which one fits better in each assignment. Among the different possibilities, the two main types of interview used in qualitative research are the unstructured and the semi-structured interview (Bryman & Bell, 2011). Semi-structured interviews refer to a context in which the interviewer has a series of questions, an interview schedule, but can vary the sequence of questions. Also, the questions are frequently not very specific and open-ended, and the interviewer can ask further questions based on significant replies. On the other hand, in unstructured interviews the interviewer normally has only a list of topics/issues that will be covered in the interview. Also, the style of questioning is usually informal, allowing for more variations in the phrasing and sequencing of questions from interview to interview. In both cases, the interview process is flexible, and the emphasis must be on how the interviewee perceives and understands issues and events (Bryman & Bell, 2011).

Bryman & Bell (2011) recommend the unstructured interview when the researcher wants to understand genuinely how people from a certain group perceive the world around, since the freer approach can be beneficial for the interviewer to "see things as the participants see them". However, if the researcher has a fairly clear focus in the beginning of the investigations instead of a very general notion of wanting to do research on a topic, then "it is likely that the interviews will be semi-structured ones, so that the more specific issues can be addressed" (Bryman & Bell, 2011, p.472).

In this thesis a semi-structured approach was adopted, however it is common that different types of interviews mix and overlap during the practice (Fetterman, 2010), therefore being natural that some questions were more open and al-

lowing room for improvisation and a more “conversational” setting. For this thesis, 30 semi-structured interviews were conducted with employees. The initial contact was by email, where participants received a brief explanation and an invitation to collaborate with the study. Due to the internal system of the company, it is possible to access the schedule of each employee and instead of sending a regular email, it can be directly an invitation for a meeting. This procedure allowed to be fast to book meetings. Then, all meetings were prearranged and each one lasted approximately 30 minutes. Before each interview, permission to audio record it was asked and the participants were explicitly informed about the content of the study, as well as the name of the supervisors of the study, and about the confidentiality in relation to the content of the interview, being me the only one to have access to it. In total, 27 interviewees accepted to be recorded. Together with the recordings, notes were also taken, and this was the only tool used for registering the interviews that were not recorded. Almost all interviews were conducted face-to-face, in the Swedish office of the company (the only exception happened through audio call), in private rooms where the interviewee could feel safer to share information. Only two interviews were conducted in an open area due to the fact that there were no rooms available, however it was possible to secure a spot distant from the most crowded part. Even so, the two participants were consulted about being comfortable in having the interview in an open space and both agreed. English was the language used in almost all interviews, and the only exception was executed in Portuguese, since both interviewer and interviewee share this one as mother language.

The technique used to select the interviewees was snowball sampling, which consist in contacting an initial group of participants and through them reach others, generating a broad network of participants (Greener, 2008). Since this technique provided a good amount of names, the participants were also filtered by diversity, opting to choose people from different areas and with different roles within Horizon, to have perspectives from different angles. To ask for recommendations ended up being very productive to spread the network, and a

positive element of confidence when talking to the next person. As far as I could note, people in general felt flattered when they heard that they were recommended by others. This is a simple strategy that I felt it was helpful to generate connection with the interviewees and contributed to a more open mood. The same is true when it comes to compliments (i.e. “I heard that your team is doing good”).

The interviews started with a short presentation about the thesis, with a general explanation of the topic to avoid biasing the interviewees, and then asking them to explain about their roles in Horizon. Then, the following questions were open-ended and focused on listening from the employees how they perceive the interaction between teams, the culture and structure of the company, the interaction between different roles and areas, and the general understanding of the strategy and alignment of the company. The main goal was to develop a bigger picture of the company and its mechanisms, in order to understand the nature of the challenge proposed (and if this was the real challenge), the company, and get to know how different employees perceive Horizon from different angles. Due to that, it made sense to invite as much people as possible from different areas and roles. In the first interviews it was asked to the participants to draw or write how they understand the structure of the company, simulating that a new client has just hired Horizon. The objective was to see if all of them know all the layers that form the company and the sequence of them. However, after some interviews this procedure was discontinued because it was taking more time than expected (the interviews were supposed to last only 30 minutes each), and also due to some discomfort presented by many interviewees when it came to drawing, which resulted that in most cases they prefer only to talk. Another aspect to touch on is the fact that some interviewees provided answers that were short and straight to the point, which required a certain level of improvisation in order to keep the pace, keep the interviewee interested, or even steer the topic to a direction that was more interesting for this study. So, flexibility was an important element applied to the interviews.

3.2.2 Extra aspects from the interviews

- Three people asked to not be recorded at all, and three participants asked to turn off the recording at some point near to the end of the interview.
- Some interviewees seemed to be uncomfortable with the recording, even having agreed previously with it. These situations motivated me to pursuit a more complete explanation about the use of the data, the secrecy, and the process of evaluation (by the supervisors at the company) that this thesis will be submitted before being published.
- Some interviewees hesitated and reflect before agreed with the recording. Also, in some situations it was possible to realize some extra thinking by the interviewees, that usually was followed by sentences like “I am not sure if I should say this” or “maybe I should not say that”. In one case, the interviewee was excited and talking, and after a specific answer he remembered about the recording and said “oh, you are recording”, but even so he did not ask to have this part removed or not considered. These actions and reactions made me think that even when people agree with the recording, not all of them are really relaxed and open in the same way as they would be if the interview was not being recorded.
- One person contacted my supervisors to make sure about the credibility of the study.

3.2.3 Observations in the fieldwork + impressions of internal events

Fetterman (2010) argues that to be present in the site of research is a very relevant stage of fieldwork, since being there one can observe, ask questions, and write down what is valuable. Indeed, to be based at the company’s office during most of the research period was helpful to feel and understand the environment, to get to know the people, interactions, culture, and how is the daily routine there. To be present also helped to blend in the company, to have informal conversations, and to participate (as an observer) in some internal events, namely Company Demo, and Product Increment. These events

were constantly mentioned during the interviews and they are formal touchpoints for everyone in the company to get to know what is happening in other teams and areas, then it was important to be there and have my own impressions. Every information considered relevant in the field work was written in different medias, being on a notebook, on a smartphone, or on a laptop. The media used was chosen accordingly to the situation.

In relation to the events, Company Demo (figure 07) is the moment where teams have the opportunity to show what they have been working on for the last six weeks. It is not mandatory to present or to attend the event, but it seemed to be a good moment to receive feedback. Company Demo generally happens in one or two floors, where the representatives of the teams receive one television to run the presentation and explain orally about their projects. Teams are spread around the space and the audience can move from one team to another freely. Each presentation lasts approximately ten minutes. Product Increment (figure 08) are global events (meaning that a virtual link is available for employees in other countries to join) where the product areas show how much they have developed since the last sprint, using presentations to demonstrate what they prioritized and why. These events are mandatory for Product Area Owners to present, but it is not mandatory to attend as a participant, even so it is highly recommended since this is the major event if one wants to know more about what has been developed across the company. Both events happen on the same day, generally with Company Demo being followed by Product Increment. There is also another event called Release Train Community (RTC), that is an informal meeting that happens three times per week, and it is mainly attended by developers. The objective of RTC is to put together teams that are working with the same customer to share information relevant to the project, for instance to share timelines, common bugs, and how is the process being developed.

Figure 07: Company demo

Figure 08: Product Increment

3.3 Analysis methods

After data-gathering it was the moment to explore and make sense of it. The first step was then to come back to the audio records and notes taken on the interviews. All the recorded material was listened carefully and compared with the notes previously taken to double-check if they were all in the same context. The audios were partially transcribed, which means that only the parts considered more relevant for the research were written and attached to the material already collected.

All the information uncovered was summarized, transferred to sticky notes, and randomly attached to a wall. The same process was executed in relation to the notes taken from the observations during fieldwork and the events attended.

It is very hard (or even impossible) to avoid having ideas, insights, assumptions, or developing impressions during the period of fieldwork, thus when these situations happened the outcomes were written and put aside. These notes were reached again for the next step, when all the notes previously written were put together, analyzed, and clustered with the goal of finding patterns. The Frame Creation Model (Dorst, 2011; 2015a; 2015b), previously explained on chapter 2 was particularly important, being used as a guide to find themes and form new frames, that in the end characterized the reframing of the initial challenge.

3.4 Ethics

Before starting the field work a nondisclosure agreement was signed by me and my thesis supervisor, where we compromised ourselves in keeping the confidentiality of information that could be sensitive for the company. Moreover, the original company's name was preserved, being adopted a fictitious name to represent the original one. In order to discuss the findings, the progress, and ask questions, each 15 days a meeting was conducted between me and my supervisors at the company's office. Also, the company provided me a laptop to be used during the thesis, since through this I could have access to the corporative email and to the tools used for internal communication and organization of tasks.

As explained before in this chapter, the interviewees were informed about every detail related to confidentiality before the conversation begins, and all of them had the chance to decide if they wanted to be recorded or not. The invitations happened through email in order to avoid any kind of pressure that a personal invitation could generate, and the text

sent to them made clear that this study was academic and not organized by the company. Both men and women were interviewed, nonetheless, to keep them anonymous, fictitious names were attributed to all. The company is composed mostly by men, and it could be easy for readers that took part in the interviews to eventually identify a woman quoted, even with a fake name, if I keep the ratio. Due to this, all the fake names were equally divided, being 50% male and 50% female, and randomly distributed. Moreover, every information that was disclosed to me outside the interviews or observed in the field was not mentioned separately in this study, being included in a specific cluster or excluded.

3.5 Limitations

The software industry is a prominent field worldwide, however, it is clearly not possible to have a research so broad, involving several cultures, markets, and policies. Thus, in order to be more specific this master thesis is limited, focusing in studying the influences potentially exerted by strategic design and reframing and how both can contribute in one specific internal challenge provided by the Swedish office of Horizon. As a consequence, other topics found inside the company (being them related to business, design, or strategy) were not taken into consideration, as well as the other Horizon's offices in different countries. Also, this study is exploratory, and although it is possible to understand the eagerness of some participants in having a 'ready-made' solution to be instantly applied and produce quick fixes, this is not the goal of this thesis, and therefore will not be pursued.

empirical findings

4

The empirical findings of this study were extracted from the immersion in the company, where I had the chance to be an active observer (and sometimes participant) of the daily routine. It is important to say that the company had others master students besides myself, as well as PhD students, but instead of being all together in a 'students' team", each person or pair was part of different working teams, which collaborates to the integration with other employees. Having a corporative email allowed me to receive invitations to take part in several events organized by the company, ranging from educational and professional ones until afterwork to celebrate some specific achievement. In the beginning it was not easy to connect with people, but as soon as the interviews started it turned out to be more natural, since after having one conversation it would not be awkward anymore to start a spontaneous dialogue in the kitchen area. The interpersonal connection reached after overcoming the barrier of the first contact was helpful in the sense that I could discuss corporative and personal subjects in a more relaxed and welcoming situation, without the pressure normally present in an interview. Therefore, for me the experience was very pleasant and rewarding. The findings below are clustered in order to facilitate the understanding by the reader. Every quote in this chapter was extracted from the interviews.

The environment

The organization has its office in a building located in a very inspiring and vibrant area of the city, easy to access by public transport. Within the building the floors have the same configuration: two large open areas where teams are located, four to five meeting rooms with variations in size, several small rooms for the ones who prefer more privacy, kitchen, printing room, toilets, shower, and lunch area. The upper floor is the exception, since one of the large open areas for teams is dedicated to presentations and conferences, and there is a rooftop. Each kitchen has a different color, and a fun and geek side of the company is represented on the names chosen for the meeting rooms, since they were inspired mostly by characters of comic books and movies. This, however,

might generates a bit of confusion due to the randomness of the names. After visiting the company constantly for three months, and booking the rooms more than 30 times, there are some that I still have to confirm in what floor they are located.

People and teams

In general, people seem to enjoy their time in the company, and the atmosphere made a good impression on me. When it comes to teams my overall impression, based on observations and dialogues, is that most teams have a good internal dynamic. It is common to see members of the same team having coffee breaks (the famous 'fika' in Sweden) and lunch together, and sometimes attending to events within the company as a group. Obviously, it does not happen in every team, but the ones who does not fit in the description are definitely the minority. Teams also have different ways of working, meaning that they have freedom to organize how they prefer to work. This internal bond transforms some teams in 'small families', influencing the overall culture, as said by Barbara: "I do not think we have a company culture, I think we have teams' culture". On the other hand, if autonomous teams are successful, there is the risk of them showing a bad behavior. "Successful self-empowered teams can become arrogant, overconfident, and maybe closed to cooperation too" (Sue).

The wish of having autonomous teams by the company also generates a paradox, that is self-empowered teams and the dependencies (and interdependencies) among them. At the same time that the company wants to provide maximum freedom for the teams to organize themselves, teams also have to cooperate in order to develop the projects, which impairs the self-empowerment desired. "We have tried to create working groups that should be able to work independently, but the system and our product is complex (…) and this work requires a lot of interaction." (Kurt). It also develop in challenges for the organization, that is to balance "how much autonomy and freedom for the teams to self-organize, versus how much leadership and direction do we need to fulfill peo-

ple's need of stability and security, but at the same time make them feel empowered" (Jessica).

The autonomy desired is also expressed on teams' names. In general, they possess names that are fun and probably with some meaning for the groups, but in some situations the names do not resemble what is the core task of the teams. This topic was addressed in some interviews, as said by Wade: "Someone decided that the teams should have anonymous names, (...) so you have no clue what the team is doing by just looking at the name. So you need to dig deeper to understand what the team is actually doing" and "all the teams' names are weird and stupid" (Barbara). According to one interview, the reason behind these very particular names are that "someone thinks that the teams should be cross-functional, they should be able to do whatever in the company" (Wade). Despite of liking it or not, for some it is said that it impacts the clarity of information. For instance, when one receives an email from an unknown colleague, and it says there that the person belongs to team Stellar (hypothetically), it demands a research to understand who is that person and team.

The events

During the period of field work I had the chance to attend to four official company events, namely Company Demo, and Product Increment (more information about them can be found on chapter 3), two times each.

Company demo, in my opinion, is a more relaxed event, where people attend to understand what others are doing and how they are developing their projects. The presenters are from different areas within the company, so there is a large variety of topics being exposed in the same room. Generally, there is around 10 to 15 people around each presenter, which creates a more informal space to quick discussions before moving to the next presenter. People are commonly interested about the demonstrations, normally asking questions, and the general mood is positive. As an outsider (i.e. not from the software world and not used with some jargons) I felt that the

presentations are commonly filled with data and hard to understand, but when videos are used to demonstrate what the software does in practice, then it is easier to follow.

When it comes to Product Increment, I felt the environment different, with more 'tension in the air'. This is natural, since this is the major event to share how the areas have been performing on the last six weeks, what they achieve, what they could not achieve, and why. Instead of having an informal style like the Company Demo, Product Increment is more formal, with no space for questions, having a more 'top-down' feeling. In the events that I attended there were a good amount of employees watching, but unfortunately there is no official number of how many were there. My impressions about these events is that the presentations are tiring, they demand too much attention to grasp, and normally they are more focused on being more informative than understandable. Just as in Company Demo, videos are really helpful to make the information graspable when there is the need to show exactly what was improved in the software.

Events were mentioned in some interviews, normally highlighting aspects that could be improved. One critic lay over the excess of acronyms used. It is understandable that acronyms were adopted to make the communication faster, however not all of them are shared and commonly used for everyone in the company, thus generating lack of understanding when used in official presentations. "Acronyms should be banned in company presentations" (Wade). Another point raised is that presentations should have a storytelling where the progress is clearly shown, since sometimes the evolution is easy to understand by the ones from the same area of the presenter as they know what happened before, but this information does not belong to people from other areas. The excess of technical details was mentioned as one reason to prevent people from joining the events.

Based on the interviews it is possible to infer that developers are the group of employees who misses more the company events, sometimes due to lack of time, or because some of

them consider the events boring, or due to the fact that in some situations they do not understand the information being presented. More than once, after mentioning something that I witnessed in a Product Increment people said that they did not attend to that. Still in relation to the same event, sometimes the information being presented does not mean anything for the ones watching. They do not know what to do with the information received and what is the real meaning of that, suggesting that they do not grasp the relevance of the information. “I don’t know what it is, but you didn’t do that bullet (pretending that he was pointing to a screen). Was it bad or good? I have no idea. Are we gonna lose money? Or shut down the company? I don’t know” (Hal). On the other hand, it is worthy to mention that employees demonstrate a bit of guilt by missing company events, which implies that they actually would like to go more and, apparently, they do not attend because it seems to be a waste of their time. When it comes to Release Train Communities (RTC), the employees, especially developers, seemed to enjoy attending (or just like the concept).

Knowledge about the company

One of the aspects of the interviews was to understand how much the participants know about the company. As explained in chapter 3, in the firsts interviews it was being asked for participants to sketch how they understand the flow of a project inside the company, and even discontinuing this practice after some try-outs, this topic was still addressed, but indirectly. In general, participants have some knowledge about the flow of a project through the company’s layers, but in most cases, it is limited to a certain extent. “In general, teams don’t have a clear view up the PO” (Hank). However, it was noted that employees with higher positions usually have more knowledge about this topic than, for instance, developers. The same argument is valid for the ones that are working in the company since its foundation. Nonetheless, the level of trust put on the company is high, and people in general believe that if they really want information, they can have it.

It was mentioned the challenge of defining a direction that is good for the company and for the parent's companies simultaneously, then the organization works with two different products simultaneously, that deals with distinctive issues, like specific time lapses, urgencies, customers, and interests. This is understandable from the business point of view, but at the same time it creates difficulties when it comes to have everyone making efforts to reach the same objective. "Teams are not necessarily grasping, connecting the short-term steps they are making with the long-term ambition of the company, or perhaps they don't even know about it" (Elizabeth). There were mentions regarding the alignment among different levels within the company and how it can affect the overall performance, as well as situations where developers do not have full understanding in relation to the meaning of what they are doing. Nonetheless, this issue is understood by some people in the organization, and it seems that some attitudes has been taking in this regard. "We have to work much more on this question (the overall goal and what is means) and get further understanding in the teams where are we heading, so that they feel they know why they are contributing too." (Arthur).

The majority of employees consider the company flat and self-organized, but this is not a 'one voice speech': While some people perceive the company as flat, others see it as more traditional (hierarchical). The ones who perceives it as flat usually argues that there are few layers separating the top from the bottom layer within the organization, the freedom conceived for people to 'come and go' (and even decide on what they want to work, in some cases), and the friendly and open environment (where anyone can share the lunch table with someone from the C-level, for instance). On the other hand, the ones who consider it hierarchical argues that 'gatekeepers' along the way prevent some employees to have a clear picture about the company.

It is interesting to cite that there are employees who consider the company horizontal in structure, but they think it should be different. They argue that the company would benefit of being more hierarchical while it is young and be flatter after

being more established. “For the first years I think you need to have a more like…’you do this’… a bit more hierarchical.” (Donna). In this regard, there were also mentions in relation to lack of clear definition for roles.

The culture

As an observer it was easy to notice that the company wants to convey an informal culture, with several spots where the employees can sit and have a relaxed conversation, and freedom for everyone to decide the hour to start and to stop working, for instance. Part of this informal culture are the names of the rooms and the teams (discussed previously in this chapter) and the easiness to develop a contact with anyone within the company. My experience at least is very positive, since I could introduce myself to people in high positions in the organization just meeting them spontaneously in common areas. “There is a new culture we have (…), which is quite unique, (…) you can easily talk to people. (…) there are no boundaries (…) If I want to discuss something with my CEO, it is not a problem at all.” (Reed).

What creates a counterpoint to this culture is the level of confidentiality that the company demands (at least demanded from me), and how limited the access of data is without having the hardware provided by the company. As a quick example, during the whole period of the study I had to use the visitor’s network (that demands the filling of a short requirement every time before login) in my smartphone, since the network for employees is only accessible through hardware provided by the company. This example is presented not as a complain, it was not a problem for me, but it is a practice that is not common in my experience in other companies and created a curious paradox in my opinion. Another example is that to circulate inside the building, an identification badge is needed, without it is impossible to change floors. However, my assumption is that software companies in general might have a similar posture of protection in relation to data and accessibility, so my objective is not judging, but instead it is aimed to expose findings and impressions.

The culture of the company is interpreted positively by employees, but it does not mean that everyone grasps it in the same way. This lack of full understanding was commonly demonstrated by the interviewees, both when they talked about how they understand the culture or when they explained regarding how much they think that their colleagues grasp about it. There is a desired culture aimed by the company, but it has been influenced by cultures and way of working inherited from other companies and countries, which makes the process of establish its own longer and more difficult. Also, as said before in this chapter, there are cultures developed inside teams, that sometimes turn to be more important for the group that owns it than the overall one. “Some parts (of the culture) maybe are clear, there are introductions and so on when you start here, but I think that sometimes maybe it is needed to repeat things to remember it” (Scott).

Also, part of the organization’s culture is to embrace people from different nationalities, since there are collaborators from several countries. There are also events to praise relevant dates for specific nations celebrated at the company’s office, like the Chinese and Iranian New Year’s celebration. There are also special seminars organized as a way to increase the knowledge of people in the company. These seminars usually address topics that are of general interest within software community, or subjects related to health (e.g. how to manage stress), lasting between 30 and 60 minutes, and they are presented by some specialist that can be an external guest or an employee. These special seminars expose that the company care about employees and stimulate them to keep learning.

Communication and interaction

Due to the initial challenge proposed by the company, both topics were addressed directly on the interviews. According to the participants, the company would benefit of better communication. Some decisions, specially about goals, strategy, and how the company is improving are not being evenly communicated to the whole company, which generates impact on

teams' understanding in relation to the value and relevance of what they are doing. When it comes to interaction among different teams, most comments points that it is not that good as it could be. "The interaction is not in a way I would like it to be (...) unfortunately I think that the teams are more islands, more like silos" (Dinah). In general, employees appreciate to use Slack (the main tool used for internal communication), but even so there is a large understanding that to talk to people directly and develop a good network are still the most effective ways to get information. However, it does not happen as often as it should. According to the interviews, teams tend to be resistant to go out and talk to other teams, relying much on the Product Owner to make the connections, thus the lack of interaction can also be understood as a behavioral issue. Problems mentioned are that teams do not have much time to interact with each other, and since they know that others are also as busy as themselves, they do not interact to avoid disturbing the colleagues. Some answers indicate that better communication and interactions have the potential to boost the company and make it even more efficient. "The problem is that we don't speak enough (...) we are missing things because we don't speak with each other" (Scott).

Another issue mentioned as a hinder for communication and interaction is lack of understanding regarding to hierarchy and roles. It was mentioned that it is not clear from whom information should be obtained in different situations, also teams have different priorities, which demands a negotiation to find out which team has the priority to decide what should be done first when in a collaboration. These issues are said to have the potential to diminish the effectiveness of the organization, thus it was understood as very relevant by the interviewees. Developers commonly are not very interested in more meetings, since sometimes they consider it counterproductive due to high demand of work. Thus, it is even more important to understand how to convey information and orchestrate interactions efficiently.

Due to some issues of communication some interesting opportunities are not being fully explored. As an example, one

short and informal event was organized by the company to create a moment where employees could ask questions about the leadership and organization, nonetheless there were no email informing about it. It was promoted only through another medium, and as far as I know others also miss this invitation.

In summary, several aspects of the organization where exposed as points that should be improved, however it is important to quote that the company is young, is learning, and is in fact progressing, making adjustments along the way. Almost all interviewee recognized that efforts have been done to address some of the topics discussed, thus apparently it is the case of a promising future.

analysis

5

In the next pages the empirical findings discussed in chapter four will be analyzed accordingly to the frame creation model, discussed in chapter 2. Wendt (2016) states that designers should not feel constrained by a method and feel obligated to follow it in its totality, instead they should take the aspects considered relevant and adequate it to the context. Hence, rather than following the frame creation model step-by-step, the aim was to adapt it to the needs and limitations of this master thesis. Furthermore, Dorst himself made clear that projects rarely can be fit within a so linear process, thus it is important to have flexibility within frame creation projects and let the challenge guide the steps that should be taken. Hence, the steps selected for this analysis are (1) archaeology, (3) context, (4) field, (5) themes, and (6) frames. Before starting the analysis properly, let me bring the initial challenge back. In order to understand the next pages, it is important to remember it:

"In our company, the development of software is done by overlapping projects run by many teams, in many different codependent – and independent, areas. In order to identify where in the development plan we are, we need to be able to understand holistically these connections and interdependencies between teams work."

Step 1: Archaeology

Agile methods are based on constant interactions and close collaboration between team members, and it relies on a set of practices that aim at creating an environment in which teams are able to respond rapidly to customer's needs and to deal effectively with changing situations (Khalil, Fernandez, & Houy, 2013). In situations where the product or project is small (or not very complex), it is more common to have one single team working from the beginning until the end to solve a challenge, and having the self-organization within the team as, probably, the biggest interaction among individuals. However, when It happens that a project is large and highly complex, it is very unlikely that one single team can work alone without taking years to finish it, which means

that companies in this situation need to allocate more teams to work on the same project. Then dependencies and interdependencies among working teams are created.

Dependence can be defined as “a state of needing something or someone, esp. in order to continue existing or operating”, while interdependence means “the fact of depending on each other” (Cambridge Dictionary, 2019). In an agile setting, the increased number of actors, interfaces with existing systems, and unexpected interdependencies are the main factors that distinguishes large-scale from traditional projects. (Rolland, Fitzgerald, Dingsoyr, & Stol, 2016). Also, these interdependencies are often not completely clear or understood (Rolland et al., 2016), and as the number of interdependencies increases, the more complex is to coordinate it, from inside and outside teams (Stray, Brede, Sintef, No, & Hoda, 2018), which makes the “work across boundaries at least as important as work within teams” (Rolland et al., 2016). Then it is possible to infer that in large and highly complex projects the dependencies and interdependencies will result in interactions among the self-empowered teams involved. This is the scenario of Horizon, the case company of this study.

Lack of interaction among working teams and lack of understanding of what is happening inside and outside teams can expose the company to many risks, for example: less efficiency (executing the same task twice by different teams, for instance), losing track of new opportunities, wasting resources, taking longer time to reach the market, and miss delivery deadlines. Consequently, the company might lose reputation, market share, and money. Being aware of this scenario, the corporation feel the need to improve the interactions among teams, and consequently their view about the whole in relation to projects and the company itself. Some efforts were made in this regard before, however none of them was successful. There was an attempt to have people responsible (‘ambassadors’) for the internal communication located in different offices, however it did not work because none of these ambassadors had the proper knowledge about the subject they were supposed to deal with. There was also the idea

of hiring someone specialized to do the job of the ambassadors, nonetheless it seems that no one was hired until the moment this thesis is being written. The other initiative was related to product roadmaps, and this one was problematic since there were no general agreement about who should be the owner of the product roadmap. What was interesting to note is that these initiatives were not necessarily connected among them nor even communicated to the whole company, having been launched by different areas within the company without being aware of each other. Thus, it seems that the traditional problem-solving approach reach a limit for this case, making room for reframing and rethinking the problem.

Steps 3 and 4: Context and Field

Since this challenge is within the organization, the stakeholders and players are basically from inside too. The main stakeholders are the company itself, and its employees. As explained previously, the company is divided in three main sectors: Product, Strategy, and Business Support. For this study, most of the interviewees are from the product sector, which can be explained due to the nature of the initial challenge, and because this is by far the largest sector in the organization. Regarding to positions, the majority of interviewees are from product sector (Developers, Product Owners, and Area Product Owners), and from business support (Group Leaders). The main positions cited are very shortly described below:

Developers – Responsible for developing the product of the company, sometimes they have more than one role within the team, like scrum master, for instance.

Product Owners (POs) – They are the ones who prioritize tasks within teams and keep track of the development. All the POs interviewed had more than one team to manage.

Group Leaders (GLs)– While POs deal with the technical coordination of teams, Group Leaders manage the human side, meaning that most of them also have the function of

team coach. Setting up teams, creating better conditions for work, and helping them to develop individually and collectively are part of the tasks. Just as POs, they usually have several teams to manage.

Area Product Owners (APOs) – Responsible for managing all the POs of a certain area, establishing priorities and goals, distributing tasks, keeping track of the progress, and managing the whole area. Also, they have contact with customers and are responsible for bringing the information for POs.

Other participants of this study from Business Support and from Strategy will not have their roles described, firstly because they usually participate in more than one sector, and secondly because some of them are the sole representative of a specific position in this study.

The two parent companies that together created the one this study focus on can be considered players, because they are outside the problem's context but inside the broader area, as well as the families of employees of this company, because some depend on the money coming from the company. Even having players in the broader field, it was understood that the issue should be explored from inside out, then the focus was on the main stakeholders.

Step 5: Themes

The interviews and the observations made in the fieldwork resulted, as expected, in a very rich source of information (explored deeply in chapter 4) and some fruitful patterns were revealed. These patterns were put together in clusters, that were refined, and the most relevant ones were turned into themes. All the themes addressed in this section were chosen because they are relevant for the company's context, for the initial challenge (being able to be used as solutions, at least partially, for the problem), and also because they were constantly addressed in the interviews as topics that are not totally clear for most of employees. The themes selected are broad and in practice overlap each other often, creating some

extra layer of complexity when it comes to observe and identify them separately. Nevertheless, in order to make it graspable the themes are going to be explained individually below.

Culture

A characteristic that has been gaining more importance over the years, culture cannot be considered only how the company operates and what are its values anymore: Culture can also be used to attract and retain employees. Especially in fields where the job offer is high, people consider if their personal purposes, happiness, and values are similar with the ones possessed by companies before accepting a job offer, thus it is important to have an alignment regarding the organizational culture. In the company studied, the culture is perceived positively by the majority of employees, however it is also interpreted in different ways, which means that it is not homogeneous within the whole organization. The quotes below can exemplify it:

"Different company cultures that need to find their way and how to coexist" (referring to the situation within the company due to heritage and o lot of new people coming from other companies) - Kyle

"The culture of the company is not clear for everyone yet" – Hank

"Culture is something that are evolving, that changes slowly." - Jessica

As mentioned before, this organization is very young and it has been influenced by several different cultures before have its own well established, thus it is understandable why the culture is not totally aligned within the company. Findings of this study indicated that this company was probably born to address (at least initially) the interests of its owners, thus automatically the culture was more based on the heritage received than developed from the scratch. It takes time to develop the culture and people are aware of it in the company but making the culture clearer for everyone might put some

barriers down and enhance communication and interactions desired in the initial challenge.

Strategy

As explained in the methodology chapter, the organization is divided in three main sectors and the strategy team is responsible for the development of the whole strategy of the company. The issue found in this research is that not everyone has a good understanding of the strategy, to where the company is navigating to, therefore it means that the strategy is not being evenly spread around the organization, and as a result some employees do not have a clear and full picture of how they are contributing and where is the company aiming to. Due to this, it is possible to infer that the company would benefit of increasing the efforts of communicating clearly the strategy within the organization.

"We lack understanding of objectives and strategy" – Rachel

"There are some miss alignments in the company, like roadmaps" – Kara

"I haven't even seen a business plan" - Clark

Structure

The structure of the company is perceived differently by employees in different positions, but not necessarily they share the same vision inside a specific area. According to the interviews, it happens that people in the same position (for instance, Product Owners) can have different perception and understanding of the structure. It seems that the structure is somewhere in between horizontal and vertical, which causes some confusion and miss alignments in determined moments. I could sense that people like the freedom they have, but not everyone knows how to use it effectively, and in some situations they wait for new commands, or do not know how to reach others since there is no official channel to do that besides through someone in an upper position, for instance. A better understanding of the structure might indeed cooperate for better interactions.

“There is pros and cons. Having so much freedom sometimes makes it harder to know what your mandate is and what you can do” – Barry

“The company is very much self-organized, sometimes it works good, sometimes it creates a lot of confusion, and no one knows who is saying what” – Kurt

“For me anyone can talk to anyone and this is a strength of the company (…) but I get the impression that people feel those barriers, even though there should not be those barriers” – Janet

Communication and behavior

Communication and interaction were mentioned consistently in the interviews and it is almost a consensus among employees that there is room for improvement in both. The perception of hierarchy mentioned previously influences the communication, creating for some the feeling that communication outside the team should occur via the Product Owner. There were also critics in relation to ‘filters’ (gate keepers) that fragment the information along the way. The critique is based on teams receiving it ready instead of being part of the construction and discovering (e.g. talking with clients) of information.

Also, it was noted that teams commonly avoid interactions even when they believe that this is the better option to get information. Based on what was disclosed in the interviews, I believe that some people feel uncomfortable when they have to exceed the boarders of their own team (and maybe area) to reach others and start or reinforce interactions. There are several reasons for that, like lack of time due to deadlines, lack of understanding about what are the limits for them, the pre-assumption that they will bother others, etc. Fundamentally, it seems to be a behavioral issue, where one gets so used to his own team that to step outside of it is so hard as leaving a comfort zone.

There were almost no comments about problems of interaction among people in higher positions, however there were topics raising questions in relation to the quality of communication among them and their alignment. Better communication and interactions have the potential to boost the company and make it even more efficient, and perhaps a changing on behaviors can be the way.

“There is resistance in teams to go out and talk to another team” – Wade

“Everyone just develops their own tools. There are still teams developing for tool development, but no one knows” – Chay

Clarity

Clarity (and its synonym ‘transparency’) were mentioned constantly during the interviews, being always connected with some of the other themes already described, and how it generates impact over different systems inside the company. One example is the impact on ‘roles’. Some positions have task descriptions considered a bit unclear, generating consequences on hierarchy and communication (it is not evenly communicated who has the mandate to decide, or if one should be or not the ‘channel’ for communication). Another example is regarding the internal events promoted by the company to spread knowledge and increase awareness among employees. The critics they received from the interviewees were connected to lack of clarity on how the information is conveyed, which demotivated people to attend even though they consider the events relevant. Clarity could also be improved in a broader level, since the details of the whole business strategy are not obvious for everyone. When it comes to transparency, it should be defined by the company what is that it means. As said by Barry: “Transparency is not to have all the information available (...), but it is also to facilitate the access to what is really important”. One example of this statement that appeared in some interviews is Jira, since the information is available there, but it is not easy to use and takes time to find what is needed.

“Transparency is important (...). I have a limited holistic view” – Natalia

“the better the teams know the value they create, the less governance they need” – Janet

Step 6: Frame

To observe the initial challenge from a different angle and embrace its complexity as a wicked problem opened new possibilities, and several different themes were obtained from the research. Having the themes explained, the next step would be to create new frames, however the complexity of this problem asks for a more complete solution. Based on the previous failures of targeting this challenge and on the investigation did for this thesis, a single intervention (or a frame that focus on only one of the themes presented) would probably not solve the problem for the long-term. It can indeed provide a quick fix, a short-term solution, but I believe that without a major context it will not have a lasting effect.

Instead of a single frame, my suggestion is to approach the challenge with a process that involves all the themes, creating what Dorst defined as a ‘meta-frame’. Meta-frame is a process that combines all the themes generated, creating a flow (or a cycle) where each one is addressed particularly each time, generating individual improvements that together shape the final outcome (Dorst, 2015b, p.115). The process developed based on themes is visually demonstrated in the figure 09.

According to the image, the proposed process starts with the strategy. The intention is to spread evenly the strategy, the goals, and how the company is performing across the whole organization. If there are issues related to the alignment of the strategy, or if it is not well defined, then it shall be targeted before in order to spread a solid message throughout the company. After finishing this step, the next one is to clarify the structure of the company for everyone, what encloses actions like clarification the roles, who has the mandate for

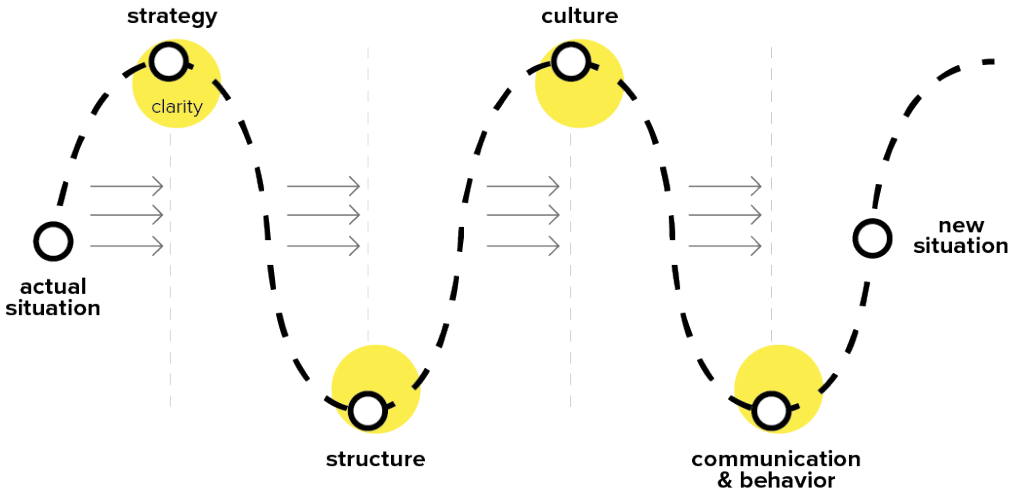

Figure 09: Process generated

what, what is expected from each position, etc. Third step is connected to the culture of the company. Having clarified the strategy and the structure, it is easier to clarify the culture of the company, thus people should know what to expect from the company and what the organization expect from them. The fourth stage, communication and behavior, can benefit of every step constructed through the process. Having a clear set of expectations plus the alignment of the stages addressed before can create a grounding for improvements in the internal communication and change the behavior in relation to interactions, for instance. According to findings from the research, the network of information has different levels within the company, with actors from different positions taking part, so it is probably not the case that there is only one right solution. It is more likely that several actions will have to be generated and implemented in order to reach a smoother communication and more interactions. Note that 'clarity' (the fifth theme) is presented after each stage, therefore for this process clarity is also a moment to reflect over the stage, and make sure that the goals were achieved, generating alignment among people in the company.

This is a process for medium and long-term, and each stage has several smaller actions that are intended to short-term results (represented by arrows in the figure 09). One example of short-term action is to start having periodically an event to share (and maybe discuss) the strategy of the company and how it has been performing towards the main goal. As far as I know, this type of event does not exist yet and the research reveal that most employees would be interested in learning more about the organization and its strategy. Following this process, it is expected that the company will reach the fifth stage, where it is presumed that significant positive changes will be perceived in interactions and communication, allowing everyone in the company to have a more holistic view over the interdependencies and maybe even anticipating them. Plus, the whole process might benefit the organization in sectors that were not mention in the initial challenge, proving that to reframe a problem can provide wider view and different possibilities.

discussion

6

In this chapter, the outcomes from the analysis (chapter 5) will be discussed in relation to the aim and purpose of this thesis, presented in the chapter 1.

The use of reframing on the initial challenge generated very positive outcomes, proving how flexible this method is. Even being applied within a software company and focused on approaching organizational challenges, the method proved itself as useful as to tackle social issues, the major source of examples presented in the literature and previously discussed. Frame creation is successful with social challenges because it adopts themes and values that are common for different stakeholders to generate alternative ways to tackle problems (Thurgood, Dorst, Bucolo, van der Bijl-Brouwer, & Vermaas, 2015), and the presented thesis applied this same principle but in the organizational context, bringing different voices and finding similar themes to compound the outcome generated. However, it is not possible to state that the reframing obtained will be successful since this study ended before its application. The reframing ended up uncovering more challenges that I was expecting at the beginning, but this is actually a very good outcome because they were mainly uncovered by the interviews, which means that everything was voiced by the stakeholders.

One of the reasons for me as a Business and Design student to experiment this thesis in the software industry is its characteristics. This industry is extremely dynamic, permeated by technological (and fast) advances, highly competitive environment, and it is expanding quickly, since nowadays it is possible to find software connected to products that did not have it before, or even enabling services to work. In this kind of scenario designers can be very useful. Designers able to work strategically (like business designers or strategic designers, for instance) can bring different perspectives, new methods, tools, and approaches for software companies. Designers commonly have a human-centered mindset and could act, for example, as bridges within and without the company, connecting different areas, bringing the perception of different groups (like stakeholders, actors, and clients) to the ta-

ble, fostering and orchestrating co-creation. Also, skills like visualization can be very valuable, especially when applied to roadmaps or for communication, for instance.

In relation to the number of designers acting strategically at Horizon, as far as I know there is no one with this role or even formal education in design among the employees. The closest of a designer, uncovered by this study, are people that attended courses in design thinking during their education. Still in relation to the lack of designers there, it is valuable to cite that one of the parent's company has several designers among its employees, and despite the fact that it is a company from a different industry this aspect could have been part of the heritage inherited, but for reasons unfamiliar to me it was not. Situations like the one cited allows me to make assumptions over why there are no designers in the company, and so I suppose that despite being closer than ever, design and software are worlds, in general, still so far away from each other that people do not realize the benefits both can have merging, or at least the decision makers in the companies are still, apparently, missing it. Considering that I did not dig deeper in this conversation my opinion is a bit shallow, but talking with employees from different positions within the company I could notice that a few understand how design could cooperate in their environment (not surprisingly, the ones that better grasp it are commonly the ones that studied design somehow). As explained before, software companies do a unique job in a very harsh environment, and design can improve how companies navigate, position itself, and deal with internal and external issues, for instance. Perhaps other companies from the same industry are in a similar situation, where their decision makers cannot see clearly the benefits of having designers acting strategically in the core of the company.

It was detected that there are gaps between people in different levels within the company, in general employees dive so deep in their own functions that this could be one (or the) reason for them to miss part of the whole. During interviews, when asked about how they perceive interactions among

teams, people commonly started to answer saying that they do not really know since they are “far from the development teams”. Exceptions for this answer are Group Leaders and Product Owners, but in a company that is considered flat I would not expect this feeling of distance by employees in general, except from the C level. According to the agile manifesto, businesspeople and developers should work together, however in this case it seems that they are not, actually they seem to be very far. Agile is also a topic where the company is not entirely aligned, since there are different voices with different desires and opinions in relation to how agile is the company and how the methods are being applied.

Miss alignments were also detected in the structure and culture of the company, as discussed previously. Regarding to structure, to be horizontal is a trend worldwide, and desired by most employees, thus companies try to position themselves in this group not only because they believe on this system, but also to attract employees (as discussed in chapter 1). Therefore, it seems that companies do not want to be on the ‘other side’ and state “yes, we have hierarchy”, even when people within the company feel that a bit of hierarchy could be actually useful. It is possible to compare it with creativity, where my personal view is that a little bit of constraint is better than to have total freedom. In my opinion, the organization does not necessarily need to be in one of the extremes of structure, but it can be somewhere in between, and it can even promote it as something really unique in the company. In relation to culture, the young age, the rapid expansion and the fact of being co-owned by others are the facts that I believe caused it to be uneven. Nonetheless, this is clear for most of employees, they know how hard is to establish the culture, and there are efforts towards an uniformization of the understanding. On the interviews there were comments about lack of transparency, but then there is also the question of “what is transparency?” or “what does transparency means?”, thus I would argue that to define internally what transparency means for the company is the first step to really be like that.

Probably the topics discussed in this chapter are not exclu-

sive from Horizon, my assumption is that they can be presented in several software companies (or even in companies from other industries), especially in the ones who share the same situation (young, co-owned, rapid expansion) of the one studied. Thus, this can be useful for other companies to use this study as the beginning of a self-investigation. Moreover, based on the strategic role of designers previously discussed, it is possible to infer that software companies would also benefit of having designers among the employees.

About the Frame Creation Model

When it comes to the utilization of frame creation model to reframe a problem, the results of this study are similar with the ones obtained by previous studies (Dorst, 2011; 2015a; 2015b ; van Leeuwen et al., 2016) in different context and fields, thus it is possible to conclude that the practice of reframing through the Frame Creation Model is equally efficient when applied in software company's organizational challenges.

Even being consider a very important part, I chose to skip the second step of Frame Creation Model, 'paradox', due to a personal view of how it could be applicable on this thesis. My perception is that the obligation of entering in a spiral of 'because questions' or look for opposite views in the beginning of the project is counter-productive, which can push the researcher to jump into conclusions, risking converging too early and getting stuck in that dimension (i.e. narrowing for solutions too soon). In the model this is considered a divergent moment, but for me it had the opposite effect. A well-executed archaeology phase can generate much information without converging, on the contrary, keeping the process diverging, and even generate paradoxes along the way (they are easily spotted in this thesis, like in the paradox about how hierarchy is perceived within Horizon, for instance). Perhaps in projects with less amount of fieldwork it is better to use the 'paradox' as the second step, but in this case, I felt that paradoxes came naturally during the fieldwork, especially between 'field' and 'themes', after having all the information gathered.

conclusion

7

The purpose of this thesis was to investigate how reframe can be applied in a software company and how valuable it can be for the organization, answering the question "how can strategic design be used to contribute with the reframing of organizational challenges in a software company?". Based on the initial challenge received, an investigation took place in order to understand if the problem defined by the company was indeed the real one to be tackled. According to the findings, the answer is that the problem previously addressed is indeed relevant, however it is not the only issue that should be solved by the organization, and probably it will not be solved adequately if targeted in a straightforward manner, as the organization itself tried before and did not accomplish the challenge. Through the application of reframing it was possible to obtain a holistic view over the challenge and identify different opportunities that were not explored when it was formulated for the first time. Also, the new path provided by the reframing allowed me to develop a process where different themes were merged to reach a more complete outcome. Therefore, reframing, a practice accessed in the design process, proved to be useful for a software company in order to investigate deeply the obstacles to be overpassed and generate new and creative possibilities. Moreover, since the reframing was applied to solve organizational problems, it also proved itself useful to tackle this specific niche of challenges.

This thesis also demonstrated that strategic design can be used as an element to bring the voices of actors and stakeholders to the table, creating bridges within the organization, while orchestrating interactions towards the goals defined. Moreover, strategic design can propose new objectives, as it happened in this study.

Contributions for the field of Business and Design

This thesis contributed to the width of Business and Design, showing that the field and its methods can be used strategically within software companies. Despite of the size, during the period of this study the company has no designers in their staff acting in strategic positions, then the presence of a Busi-

ness and Design student contributed to provide new methods and different perspectives over a challenge that has been problematic for them. Hopefully this thesis can also influence other companies from software industry to understand why they might benefit of having designers working strategically in their companies. In fact, the topic investigated on this thesis can be present in companies from several industries, then I would argue that this study can also be an inspiration beyond software companies, enlarging the field for business designers both as practitioners and researchers.

Suggestions for future research

I believe that there are several other possibilities for design to be applied strategically within organizations, which varies according to the reality faced by the case company. Specifically, about the case used for this study, it is suggested for further studies to conduct implementation and monitoring to see how precise the process developed was. Also, it is recommended to have a small team working together with the researcher to make viable to do extra tasks, like workshops, for instance. Workshops would be interesting in order to bring stakeholders to co-create instead of only bringing their voices to the project, nonetheless it also uncovers other levels of difficulty, specially in large organizations (for instance, which people should be invited and why? How to avoid power relations among people from different positions to make everyone comfortable?). Another recommendation for further studies is to investigate more companies using the reframing, and then to compare the results in order to understand how the overall result is in comparison to the previous situation, and how the results are perceived by employees (not only in operational terms, but also in happiness and meaning for them). It is also encouraged that other researchers aim to create actions to accomplish successfully each of the steps suggested in the process generated by the reframing in this thesis. When applied in organizational context where there are no numbers to state how positive and valuable is an outcome, it can also be interesting to develop ways to measure the effects of new frames within an organization. This could

be, for example, through the voice of employees and how they perceive the situation before and after the reframe.

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