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Design Thinking for Sustainable Competitive Advantage

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'Not to innovate is to die'
(Freeman, 1982)

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Introduction

Design thinking has gained a lot of importance and visibility within the last decades. Its increasing importance is due to the variety of applications that it has and the realms in which it can be applied – for example, design thinking can be used to design new products, processes, services, experiences, and other intangibles that can be implemented and improved according to users' needs. However, design thinking is not just about creating new tangible or intangible solutions, it can also be applied to solve social and political issues through a user centric point of view. Furthermore, it can be used to design or re-design public policies that are more effective and efficient in terms of their quality and the social impact that they have in our society and in lives of people.

Design thinking is an approach for creative problem-solving and for the opening up of paths that had been previously unexplored or thought as not related to the issues being researched. More specifically, it can be defined as a 'systematic and collaborative approach for identifying and creatively solving problems'. (Luchs, 2015) This process is called *design thinking* because the way through which problems are investigated and solutions are carried out follows the same intentionally non-linear process that a designer would follow. "Designers tend to explore and solve problems through iteration. They quickly generate possible solutions, develop simple prototypes, and then iterate on these initial solutions – informed by significant external feedback – toward a final solution." (Luchs, 2015)

The design thinking process should be thought as an *exploration* rather than as a tool merely aimed at gaining competitive advantage through innovation, for example in the realm of corporates. Competitive advantage can be a consequence of the process but it is not the purpose. Competitive advantage, indeed, derives by the increasing knowledge that companies gain, growth of productivity and decreasing costs due to the value of the innovations carried out. It is crucial that companies keep innovating once they have reached this position of leadership in order to keep their market share or to increase it

even more. Sustainable competitive advantage is something that has to be implemented and maintained through investments in knowledge.

It is important to note that what companies must achieve is design-driven innovation which is what Verganti describes as radical innovation of meaning. Innovation happens, therefore, to a deeper level than incremental and radical innovation because design driven innovation brings new meaning for new unrevealed needs that users were not even aware to have. This is what is revolutionary about the framework of design thinking. Design thinking literally design solutions to previously unknown and unmet needs that users have in their everyday life. The power of this framework is that it can change life of people by making them easier and more meaningful. Solutions must be found through this process through a human-centered approach, which aim to co-create meaningful outcomes in terms of their function, design, ease of use, and so on.

Design thinking can be applied to every kind of problem and it gives a framework divided in four stages and it makes it easier to check on the outcomes of every stage, see if innovators are satisfied with them, and, if not, they will iterate back and forth until the solution is meaningful, the prototype is tested, and the feedbacks gained from the field test are positive. The process is both abstract and concrete and it requires a lot of different skills. This is why it is important, in order to apply design thinking, to design a team with different backgrounds, personalities, and learning skills. To every stage of the process different skills are needed and therefore different people can contribute on different levels.

Design thinking has become more and more widespread all around the world in the last decades, even though it has already started to be conceived and developed in the early 1960s. It started to be mentioned as a “way of thinking”, and in the next decades it has developed until when it first started to be defined as “design thinking”, in 1987 by Peter Rowe, professor of architecture at the University of Harvard. He wrote that designers should act through ‘the lens of inquiry’ (Rikke Dam and Teo Siang, 2019), which is indeed a stage of the process of design thinking. This stage is the one of field research, exploration, ethnography together with people who will be users of the future product or service. Peter Rowe wrote that design has the function to comprehend the surrounding environment through deep field research and inquiry, in order to identify the essence of

things because this is the way to design artefacts that are, at the same time, new, meaningful, and consistent with the needs of users.

Roger Martin, author of the book *The Design of Business*, conceived a model that shows how to advance during the three different phases of innovation, which he defines as mystery, heuristic, and algorithm. He gives this tool to manager called the knowledge funnel which allows them to understand that knowledge has to go through the above-mentioned steps during a period of time which should be as short as possible. Time is an important factor when it comes to innovation, leadership, and competitive advantage. The least time is needed to carry out innovative solutions, the more time the company will be able to keep competitive advantage and distance itself from competitors. Furthermore, during this time of leadership, the company has the possibility to invest even more on research and innovation in order to try to gain even more competitive advantage, consolidating its status of leader in the market. The more the company innovates, the more it gains profit, and the more it can invest in further innovative solutions, and this cycle should keep going over and over again in order for the company to be successful. (Leavy, 2010)

Roger Martin points out two interesting concepts and he states that, in order for companies to be successful, they must find a balance between these two factors, which he defines as reliability and validity. Martin believes that they are the factors that allow companies to reach disruptive and sustainable innovation, if they take place at the same time and with a right balance. Martin states that companies tend often to focus on one of the two aspects, and the result in the end is not as good as it should or could be. Martin writes that reliability and validity are valued in a different way by different innovators. For example, he states that reliability is more valued by managers and executives, while validity is more valued by designers, and this is another factor that shows the importance of design within corporations and how it should be implemented together with all the management activities. In fact, validity is a tool that allows designers to use their imagination to create new, superior, and improved solutions, while managers prefer to develop robust, systemic, and standard solutions that can be repeated. Therefore, what Martin states is that the solutions should be at the same time new, superior, improved, robust, systemic, and repeatable. This is why companies should put their efforts on

developing reliability and validity at the same time and to the same extent in order to create something radically new. (Leavy, 2010)

Throughout the thesis, I will describe theoretical foundations and origins of design thinking in order to give an overview on the concept. I will continue describing it as a factor to create innovation and describing the different paths useful to achieve competitive advantage through design. I will further discuss the importance of meaning in order to create radically disruptive solutions that have the power to satisfy until then unrevealed needs of users, with the aim of changing their lives in a meaningful and deep level by providing them with what they really need. This can be achieved through the human-centered perspective of design thinking. Finally, I will discuss the relationship between innovation and competitive advantage in order to understand the connection between the two concepts and what kind of innovation needs to be achieved to create sustainable competitive advantage.

Chapter 1

Theoretical foundations of design thinking

1.1 The Concept

1.1.1 Design thinking as human-centered process

Design thinking belongs to the field of innovation and new product and process development. This is the reason why it is more and more studied and implemented all over the world by single individuals, private and public companies, governments, and further institutions.

David Kelley, founder of IDEO & the Stanford d. school, explains that design thinking is an iterative approach for creative problem solving. It is a human-centered path for innovation where human needs are indeed put at the center of the creative process. This perspective allows designers to come up in the end with routinely innovative ideas. The assumption here is that everyone can be a designer because design thinking helps researchers to unlock their creative potential to develop innovative solutions for people's unmet needs.

Some other common traits of the approach are: cross-disciplines and collaboration, holism and integration, flexibility and comfort with ambiguity, multi-modal communication skills and growth mindset. (Luchs, 2015)

Cross-disciplines and collaboration refer to the employment of heterogeneous teams with people who have different backgrounds, education, interests, knowledge. During some steps of the process, the team can also involve external users, such as for example

potential customers or suppliers. This allows the team to gather different and external points of view that can create an impact on the research process. (Luchs, 2015)

Holism and integration refer to how design thinkers should look at problems and solutions as whole, not focusing too much on the details. Rather, they should aim to put together many different ideas, connecting concepts to develop connections that were unexpected until then.

Flexibility and comfort with ambiguity, in a similar way, refer to skills that designers shall have to carry out successfully their research. They should always be confident and comfortable with ambiguity, uncertainty, and vagueness. (Luchs, 2015)

Multimodal communication skills refer to the channels that designers can use to carry out their research. A design thinker should think out of the box, and this can be achieved also through the employment of disparate and diverse channels and media. For example, visuals, abstract concepts and concrete prototypes can help researchers to develop their ideas. (Luchs, 2015)

Growth mindset which is related to the eagerness and enthusiasm to explore, test, research, communicate, brainstorm, prototype, re-iterate, call into question, re-make, and so on. (Luchs, 2015)

Design can be thought as a natural human need. It is a process or a plan aimed at creating a product, a service or any kind of concrete or abstract artefact, in order to solve a problem or to satisfy a need. Designers are commonly thought as creators of aesthetic works of art, using shapes, structures, and patterns to communicate a concept. Furthermore, designers also make already existing concepts and ideas more attractive. But, as Brown has written in his paper "Change by Design", innovation nowadays "pulls 'design' out of the studio and unleashes its disruptive, game-changing potential." (Brown, Katz, 2011)

Brown, one of the fathers of design thinking, believes that it needs to move "upstream", even more than it has already moved. By upstream, he means that design thinking should move closer and closer to the decision makers within corporates and leaders of our society to really change the point of view by which decisions are made, concerning private corporates outcomes and public and social issues. Currently, in our society, there is the urge to go beyond the usual schemes and beliefs and here is where design thinking can be applied to redesign systems and structures, as well as products and services. Design thinking is described as "a means of exploring new possibilities, creating new choices, and

bringing new solutions to the world.” (Brown, Katz, 2011) This can be achieved with the process of design thinking that I will describe and explain in the next chapter.

1.1.2 Identification of problems and problem-solving through qualitative research

Michael G. Luchs, an Associate Professor and Founding Director of the Innovation and Design Studio at the College of William & Mary’s Raymond A. Mason School of Business, has defined design thinking as a “systematic and collaborative approach for identifying and creatively solving problems”. (Luchs, 2015) He explains that it is composed by two main stages, which are the *identification of problems* and the process of *problem solving*. What he notices is that in our society there is a tendency to put all the efforts in solving problems, instead than in their identification. As creative human beings, we see problems and we want to find answers, generating ideas and possible effective solutions. Luchs explains, that “we are naturally creative beings, and given any problem – however ill-defined – most of us can generate a set of ideas.” (Luchs, 2011)

He further explains that the problem is that we tend not to generate innovative, revolutionary and radical ideas. This is what is different in design thinking. The key focus is particularly in the definition of the problem, of the real need that has to be satisfied. Indeed, ideas and solutions come only after a deep qualitative research in the field, where real costumers or users are, namely people and their real lives, habits, and their routines, where their needs are not identified and therefore satisfied. (Luchs, 2011) This is the starting point of design thinking – going out to see the real users. When conducting design thinking research in order to identify unsatisfied needs, researchers cannot go in the field and ask users what they need or how they would like to improve their quality of life, for example. Users would mostly not be able to answer. We should find this out through qualitative research. This kind of research works with non-quantitative data, that is to say without numbers.

Field research is represented, for example, by open-ended surveys and interviews, focus groups and content analysis of text documents. When researchers interview users, they do not ask what they would want or like, they would rather ask questions in order to understand how they live, what they do and they would observe their lives. Qualitative research is carried out by targeting a certain segment of population and studying lives of people in a micro-level.

Qualitative research can take long time before researchers collect enough information and observations. It can take months of field work for the collection of different types of field observations – such as notes, video, photographs plus the direct observation of people with which research connects. This qualitative field work is what makes design thinking different from academic or corporate thinking. Contrary to academic researchers, design thinkers aim not at creating additional and new knowledge, verify theories or scientific hypothesis. What design thinkers do is “*empathise*” (Brown, Katz, 2011) with the users and translate observations into insights, and from this stage on, they will start ideating and iterating through the design thinking process, to bring to translate the observations into insights, and these, in turn, in new products and services which will improve people’s lives. (Brown, Katz, 2011)

Qualitative research is a *deep* exploratory process rather than *wide*. Results tell much about the people being interviewed. Thanks to qualitative research, objects and subjects of study can be analysed with more detailed focus. Also, since the samples analysed are rather small, research can be adjusted and adapted more easily than when conducting quantitative research. Qualitative research is also more human, since it is not based on numbers and values used to extract patterns and observations. Therefore, it is more flexible and open-ended in its nature and leaves more space for *creativity*.

A typical example of qualitative research is the focus group. A focus group is a way to conduct market research which concerns a small number of people - usually between five and sixteen. They are guided by a moderator to discuss about certain topics. It is mainly not about formal and direct questions but more about discussions between participants. Therefore, researchers can collect qualitative data, such as preferences and beliefs, based on the discussion. Other methods to conduct qualitative research are one to one interviews, detailed and deep surveys, and observation of potential users directly in their normal life.

1.1.3 - Innovation in a world “overcrowded by ideas”

Roberto Verganti, professor of leadership and innovation at Il Politecnico di Milano, explains how we are living in a world where ideas are not rare, we are living in a world “overcrowded” by ideas. He states that there are more creative people, that there are more and better tools to be creative, such as digital technologies that allow us to access ideas wherever they are. An interesting example that he brings up, is the explosion in an oil rig in 2011 in the Gulf of Mexico. It was the biggest accident happened until then – for a few weeks they could not stop the spill. So, what is the point here? To find a solution to this dramatic catastrophe, experts decided to set up a website where they would ask people for ideas in order to find possible solutions. It took only two weeks to gather more than twenty thousand ideas, for free. He states that it is a real positive thing that we live in a world filled with an unlimited amount of ideas.

The point that for Verganti is key is that this amount of ideas has made dramatically change the nature of innovation. In his research, he has found that there are three different mindsets that can enable us to create innovation. The starting point of his dissertation is that there are two different levels of innovation, the level of *meaning*, and the level of *solutions*. The meaning is what we want to achieve, our goal, when we create innovation. The solution is the outcome of our innovation process – the product, process, service that we create to accomplish and carry out that meaning. Verganti says that meaning is a direction, it is the reason that make people develop new possible innovations. The solution is how to get there.

In this world overcrowded by ideas, it is indeed easy to find solutions for our problems. However, creating and finding new and, especially, meaningful directions it is much harder. Successful innovators are those who change the meaning of things, not the ones that create a better or new product or service. So, the first mindset he identifies is that, when we are in an “overcrowded” world, innovation is not about searching for solutions, innovation is about looking for meaning, which is possibly new and original.

The second mindset Verganti argues is about how innovators should search for solutions. Verganti states that when innovators search for a new meaning, it should derive from themselves. Innovation should not move from the outside in but, rather, from the inside out. He believes that the solutions can come from the outside, from others, but the

direction and meanings should come from the innovators. If innovators do not believe in their ideas, ideas will never be innovative. Innovation will come from the understanding of what can deliver more meaning to users. However, the need for another mindset to counterbalance this inside out approach occurs. This is why if the innovator believes in the meaning of the innovative direction, this does not mean that people will like and welcome the innovation. Innovators should themselves foresee what is more meaningful for the users – it is their capabilities to expand their possibilities.

There is something more to discuss – innovators can believe in what they are seeing and developing but this does not automatically end up in an either incremental or radical innovation. Verganti argues that we need a third mindset in this picture. This mindset is about filtering information in a world “awash with ideas” – within this world, we do not actually need more ideas. Therefore, in order to be innovators of meaning, there is the need to start from one’s self, and, as I previously wrote, this is not enough – because a recurrent bias is that we see what we want to see, he explains. We need and have to start from us, but to compensate this and to make sure that we will not follow this only one direction, we need *criticism*. Criticism helps innovators to go and dig deeper into the ideas, in order to start seeing things in different ways, in order to eventually start taking different directions. This is what in design thinking is the iteration stage of the process.

To summarize, innovators have ideas and this is not enough in a world awash with ideas. Ideas should come from themselves in the first place, and, consequently, they must believe in it – and this has to be the starting point of every innovative process. Consequently, they have to dig deeper, explore more potential meanings, gather feedbacks from other innovators and potential users, iterate – i.e., going back and forth to define and redefine needs and wants and their meaning, always with a critical and questioning mindset.

1.2. Hermeneutics as a framework for investigation

1.2.1 Hermeneutics for radical meaning-innovation

Verganti and Öberg want to find out what is the best and more meaningful way to innovate in order to deliver new experiences and products to users. Innovators should go deeper than previously in a world saturated with every kind of product or service. They should radically innovate the meaning of products. What Verganti and Öberg explain in their paper *Interpreting and Envisioning — A hermeneutic framework to look at radical innovation of meanings* is that there is a lack of theoretical knowledge when it comes to the meaning of new products. Verganti proposes the science of hermeneutics as a possible angle and perspective able to question the radical innovation of product meanings.

Hermeneutics, as a procedure of interpretation, is about issues that emerge when managing significant human actions and activities and the results of such actions, in particular messages. As a methodological method, it offers a tool kit for proficiently treating issues of the interpretation of human actions, writings and other significant material. Hermeneutics glances back at a long tradition, as the arrangement of issues it addresses has been predominant in human life, and has over and over again called for thought: interpretation is a pervasive activity, unfurling at whatever point people try to get whatever interpretation they assume and perceive as significant, namely *meaningful*. Unlike classic creativity theories, where innovation appears to be seen either as a problem-solving method or as an ideation process, hermeneutics provides a framework for looking at innovation as a system of interpretation (developing concrete scenarios rather than seeking an optimal solution) and imagination (imagining things that are not yet demanded, rather than being requested, instead of responding to existing needs).

Verganti states that external networks play a central role in this cycle because they feed a constant conversation of what is important or not. Therefore, hermeneutics becomes helpful for explaining how outside actors might have a significant impact on how a business reframes the understanding of the market environment or gives meaning to reality.

Verganti notices that companies mainly search for opportunities within the scope of the actual and current main meaning in a market or sector, and other companies actually challenge and question the current main meanings in order to create opportunities beyond the existing scope.

The meaning of products is related to its purpose as it is perceived by users of that product, it is not about its features. Innovation of meaning has never been deeply studied because of its nature. Verganti explains that meaning is particularly peculiar: “it involves symbolic, emotional and intangible factors”. (Verganti and Öberg, 2013) Innovation has always been developed for tangible factors. Classical theories, designed primarily to innovate tangible factors, such as technology, utility, operations, and function, thus swaying when used to investigate this type of intangible and abstract innovation. It appears that new approaches are needed.

1.2.2 Hermeneutics as a means to interpret and envision

Hermeneutics is used as an approach to investigate what is indeed radical meaning innovation. According to hermeneutics, innovation comes from a process of interpretation and envisioning, investigating the role of external networks in the process of meaning creation and development. Meaning innovation aims to change the way products are valued and especially in the reason why they are used, instead of focusing in the features of the products or how the product has to be used. The meaning projected in new products can still meet functional and needs for certain features but it will have also components related to symbolic and emotional needs.

Therefore, innovation is often seen as the investigation for an original and flawless solution, based on a specific problem. This means that innovation is often considered as a process of problem-solving, assuming that the exact problem was well identified in the first place. This type of innovation works when problem-solvers are dealing with technical problems but this method starts to fail when the innovation being researched has to deal with meaning. Indeed, there is no optimal meaning because, as already

explained above, meaning is nearly always depending on subjectivity and perceptions, cultural and social environment. Hermeneutics comes here to help because rather than an optimal solution, it offers various interpretations to problems.

Innovation as a problem-solving process deals with the real-world objects and facts, while innovation as ideation deals with more subjective, abstract and emotional elements. These perspectives can be seen as objective and subjective but they do not fully cover the nature of meanings and its dynamics within our society. This is where hermeneutics comes into play to interpret and envision. Interpretation is relevant because we are looking for meaning and envisioning is relevant because our purpose is to look for a radical innovation of meaning. Instead, envisioning involves imagining new scenarios that do not nonetheless exist. It consists in an image of an idea in a context to be conceived. "It is therefore a process of *generative* interpretation." (Verganti, Öberg, 2013) Radical innovation does not exist without considering the role of external networks and all the players relatable directly or indirectly to the research being carried out. Hermeneutics comes into play to offer different interpretations of the context, not to deliver perfect and optimal solutions.

Within the framework of hermeneutics, a concept or idea can only be understood if it relates to the context and the other way around – the context can be understood if the single parts are understood. Both parts and context as a whole have to be understood in an iterative process. New understanding is developed when interpreters act directly in the field. It is a subjective and open-ended process where interpreters observe and infer from real life situations and scenarios and they try to derive insights that can be even better than the ones of real actors within those scenarios. There is no single of definite solution but just understanding of the present scenario that will always change and evolve. The aim of hermeneutics is to offer different points of view thanks to a different approach to identification and resolutions of problems. External networks contribute to offer more perspectives and possible scenarios. And the more different is the network taken into consideration, the more novel will be the interpretations deriving from it.

To summarize, before moving forward with the discussion about hermeneutics and how it is applied, these are the main four characteristics as to meanings: i) meaning depends on context, ii) there is no optimal meaning, iii) radical meaning can be unusual and unconventional in the first place, and iv) radical meaning is co-generated. Consequently,

the four main characteristics of hermeneutics are i) hermeneutics takes into consideration the single parts and all of them together as a whole, ii) interpretation as an iterative process, iii) taking actively a critical position, and iv) building a new understanding based on this process. (Verganti and Öberg, 2013)

1.2.3 Hermeneutics as a framework to redesign users' experiences

Users adopt and use products when they make sense to their preferences, psychological needs, of the context in which they are immersed socially and culturally. Hermeneutics moves its understanding between parts, which are the concrete parts of products and how they are meant to be used by consumers, and the whole, which is the entire social and cultural users' context. As a result, the breadth of research and analysis is expanded. The idea is therefore to move further from the technical features and think from a bigger and wider perspective. Basically, hermeneutics entails that radical meaning innovation has to be designed, at the same time, in two stages on two different levels: the product itself with its technical features and the whole user experience.

The result of the process is basically a *scenario*, in which meanings play the most important role. Indeed, the definition of scenarios is "a sequence of events, especially when imagined. An account or synopsis of a possible course of action or events" (Merriam Webster, 2011). They are parts and whole put together at the same time. A scenario of meaning describes accordingly the new meaning on a general and specific degree. It can be in the form of a report, of a sketched storyboard, of drawings and illustrations of the evolution and unfoldment of the events that are part of the story. Scenarios help to formulate ideas and they allow researchers to develop ideas by looking at a concrete story. It is the starting point to develop ideas worth of being further developed. The purpose of scenarios is catching the core interactions within a system, incorporating at the same time a coherent message.

Meanings cannot be optimised because of their qualitative nature. Meanings take the form of knowledge, outlines, programs, impressions, points of view, and news. We are used to

think about economic theory when it comes to innovation but here the point of view is reverse because there are no models to optimise such subjective measures like the ones mentioned above. Terwiesch and Ulrich, business professors at “The Wharton School” assumed when formulating new models and theories that there is always a solution that is optimal – researchers just need to find it because it is out there. (Terwiesch and Ulrich, 2009) Hermeneutics is revolutionary according to the view it looks at problems and it finds solutions. Hermeneutics is an iterative process and aims to interpret the world going back and forth to bring more and more insights. These new insights reinterpret reality over and over since change takes place endlessly. Therefore, there is not a constant interpretation but different and always changing. This approach teaches us “a new theory of innovation that instead of focusing on convergence towards an optimal solution, is based on a continuous and iterative debate, which firms take an active part in.” (Verganti and Öberg, 2013) External players are a source for new perspectives, exchange, and debate. Different perspectives and an iterative process make researchers come up always with new ideas and unexpected applications.

Criticism for existing cultural beliefs is what has to be challenged in order to create radical innovation. In this sense, hermeneutics is useful here because it helps to think out-of-the-box and it allows to overcome the cultural barriers and the social paradigms existing in the market. Hermeneutics therefore allows researchers to question existing paradigms and patterns in order to come up with the envisioning of radically new scenarios. And again, the role of external networks is compelling here. External networks are not only important as an external source of integral competence and skills but they should also be used as a way to question and criticize the current state of affairs to enter into what has been, until then, thought as peculiar and unconventional. It is more likely that people outside the company environment are critical and ready to question and bring different points of view. They are not employees, suppliers, nor customers, they are completely external people that are not related in any way to the company willing to innovate and they are indeed the perfect source for coming up with unexpected perspectives to change meaning.

The conclusion regarding hermeneutics is that it does not bring solutions or disruptive concrete strategies to radically innovate the meaning of existing paradigms. Rather, it is a theoretical approach that gives researchers a framework to look at innovation from a

different angle in order to develop outlandish solutions by challenging existing assumptions. Radical innovative meanings are hard to develop because meanings are dependent on the context, therefore, they are not absolute, and they need to be generated in an iterative process and in relation with external users and players by way of a design action. Hermeneutics suggests that innovation has to be looked at through an approach of interpreting reality and people's needs and envisioning new scenarios. "Innovation of meaning does not come from users, but from interpretation." (Verganti and Öberg, 2013) The key role belongs to managers of companies, who should not implement existing solutions but they should rather reorganise the strategy of their companies in order to create new visions. It is indeed interpretation that make innovation of meaning possible. Leaders have to be on the front line in order to guide the company with a different strategy. The role of leaders is therefore crucial to catch opportunities and make the company orient towards a certain direction aimed at disrupting the existing frameworks.

1.3 Design-driven innovation

1.3.1 Three different types of innovation: incremental, radical and design-driven

Innovation has always taken two directions – improvement or radical change in product performance thanks to technological improvement and findings, and, on the other end, enhanced products according to the more defined needs of customers. The third strategies introduced by Verganti in his book *Design-driven Innovation — Changing the Rules of Competition by Radically Innovating What Things Mean* is, indeed, design-driven innovation. Through this new concept, Verganti refers to radical innovation of meaning.

Radical innovation is meant in this scenario by Verganti as a non-incremental type of innovation.

Incremental and radical innovation have both advantages and disadvantages and they drive innovators in very different directions. Incremental innovation is less risky than radical innovation because it takes place in existing industries and markets. The uncertainty is low and it is mostly successful when applied but the margin of profit is smaller than in the case of radical innovation. Incremental innovation utilizes the existing technology and the focus is on *improving* the existing product, service, process, business model, and so on. Incremental innovation boosts competitiveness in the existing industries and markets through improvements in features and technical components. On the other hand, radical innovation employs new technologies and explore them to conceive products in a different way or to create radically new products. Products do not exist before radical innovation takes place and they are disruptive, which means that they completely transform the existing industry or market or they create a new one. The risk is higher regarding radical innovation because it is about bringing innovation to a different and, until then, unexplored realm. The margin of profit can be huge but this is also related to higher risk of failure. It is riskier to introduce a disruptive product rather than an incrementally developed product. The reason is that there are no evidence or statistics that tell if the probability of being successful is high or low and if consumers will like the product and will adopt it. Higher risk is one more time correlated to higher profit margin. (QS Study, 2019)

1.3.2 Innovation as a three-dimensional concept

According to Verganti and Öberg, innovation is a three-dimensional concept. The first two dimensions are, as according to economic theory, “markets” and “change of technology” – while the third dimension is “meaning” and why products are consumed, used, wanted, and needed. Verganti and Öberg’s focus is in particular in radical innovation, which is by Verganti defined as ‘design-driven innovation.’ (Verganti, Öberg, 2013) The classic

economic theory consider innovation as a result of technology, where change of meaning is a consequence. Instead, innovation is here driven by the investigation and research for a new meaning, where technology is the instrument used to reach it, not the result of this research. Meaning innovation is related to both already existing markets and new ones.

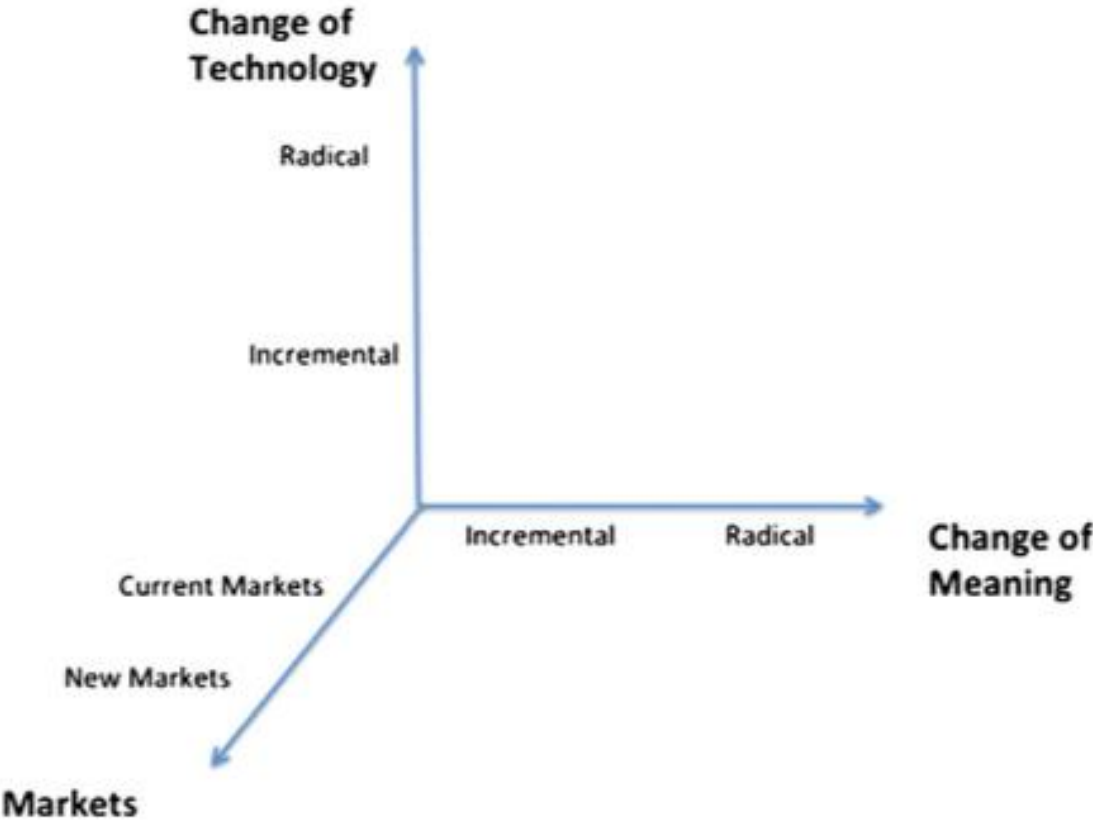


Figure 1 – The three dimensions of innovation (Verganti, Öberg, 2013)

A first element that is worth considering when talking about meaning innovation, is how meaning is dependent on the *context*. What makes sense to consumers depends on the socio-cultural context in which a service is used, which can vary considerably over time and space. And, unlike technology, it is hard to refine the meanings of the material. It can only make sense to them. Second, the focus is on radical meaning innovation as well. And these new radical meanings are peculiar: they differ significantly from the industry's dominant meaning. By challenging their own prevailing assumptions about what makes sense, incumbents can hardly recognize the value of these dominant meanings. Basically, a radical meaning's change is combined with a reinterpretation of the socio-cultural paradigm of the environment taken into consideration, the redefinition of the accepted interpretations of what a product is, what it is intended for.

Radical meaning innovation is co-generated through an iterative process. It is not a mere improvement of something that already exists, but something that does not yet exist and that needs to be created. Co-generation means that the real users immersed in the socio-cultural context give meaning through feedbacks and through use, when they are actually using the products or services developed. Users are, then, interpreters. (Verganti, Öberg, 2013)

1.3.3 Relationship between innovation in meanings and technologies

Research for meaning is not taken into consideration when R&D are carried out. (Verganti, 2009) Indeed, research and development focus particularly on incremental and radical innovation. Design-driven innovation concerns radical change of meaning. The connection between radical change of meaning and design thinking is that design thinking is a tool that can be used to design radical change in how products are conceived and used. Design thinking is a framework, it is not a solution. It is a means to explore new solutions and scenarios with the purpose of designing meaningful experiences.

It is important to define the strategy to successfully innovate beforehand, and the usual two strategies are market-driven innovation – “market pull” or technology driven

innovation – technology push. As it is shown in the picture below by Verganti, there are two axes when it comes to innovating. The vertical axis shows technological innovation, which can be incremental or radical, while the horizontal axis regards meaning, which can be, as well, incremental or radical. In the lower left part of the diagram, Verganti places “market pull” and user-centred innovation. This corresponds to incremental change both in technology and in meaning. Innovation is therefore pulled by the market and there is no disruptive innovation. Market-pull innovation means that the market is lacking something, which means that there is an unmet need, and this provokes the creation of a new product. Therefore, it is the market that “asks” for the innovation to be carried out. Incremental innovation takes place within the existing market and it is, for example, an improvement in the product features or in the user experience.

In the upper part of the diagram, we can see “technology push” innovation. Technology push innovation corresponds to radical change in technology, which can be linked either with incremental change or radical change in meaning. Technological push is related to technical problems and issues of existing products. This lack of quality makes researchers investigate for new solutions and improvements in the technical features of the products both internally, thanks to the R&D department within the company, and externally, throughout external sources for technical knowledge. R&D or technical knowledge, alone or together, give the company a starting point to further implement the existing technology and create new solutions. This is what technology push is. As shown in the diagram, technology push can be connected both with incremental and radical meaning innovation. This means that technology push can change the meaning of how products are used just by creating radical change of technology. This is very interesting because, here, technology push overlaps design-driven innovation in this sense, as it can be seen in the upper right side of the diagram. Technology push might enable disruptive innovation, which happens when a new technology changes the market or industry in a relevant way. The new technology disarrays the existing structure and this is why it is defined as “disruptive”. (Twin, 2019)

Eventually, design-driven innovation corresponds to radical change of meaning, which can be associated with both incremental and radical change in technology. Companies propose a new meaning, which is what people will be attracted to and the reason *why* people buy the product.

Users often buy products for fulfilling deep needs for the product's function and for "intangible psychological satisfaction". (Verganti, 2009) This is a natural human characteristic – people buy products to fulfil needs, and every product has an intrinsic meaning. The knowledge lacking, indeed, within companies nowadays is that meanings can be found through the R&D department. Meanings are not a marketing strategy to sell more or a way to persuade consumers to buy more – meanings are what people are looking for because they need them to have a more meaningful life. Meanings can be developed within R&D departments, and innovation can be achieved through *design*.

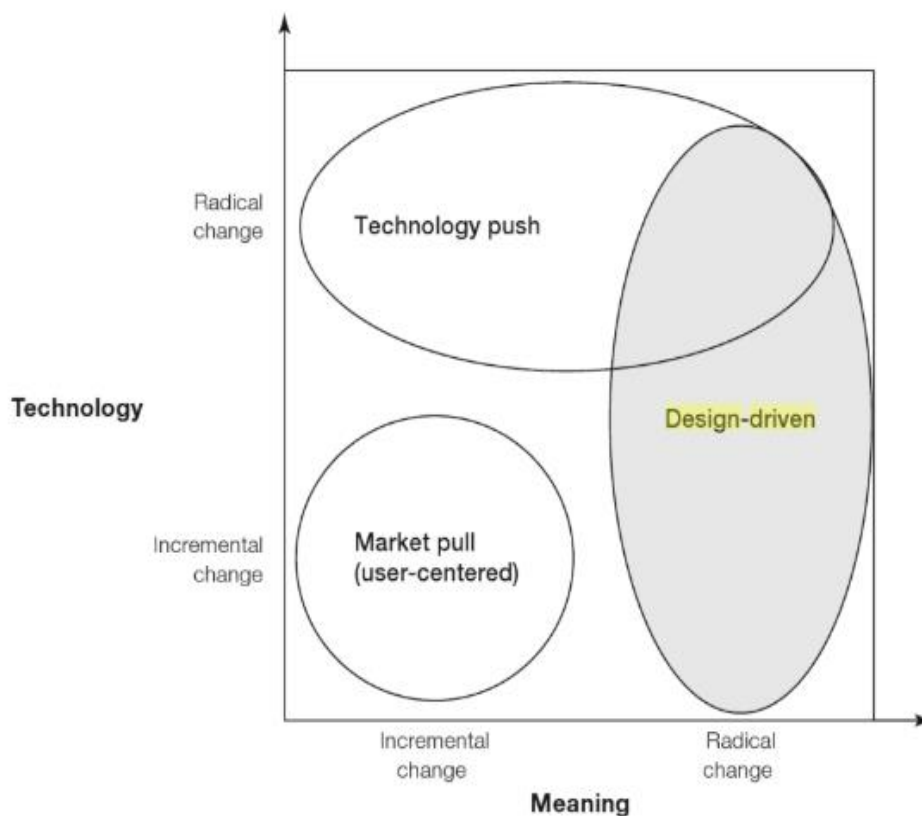


Figure 2 – Design-driven innovation (Verganti, 2009)

1.4 Origins of design thinking

1.4.1 Design as “a way of thinking” in the 60s

In order to have a comprehensive view on design thinking we need to explore its origins and how it developed over time in order to become spread worldwide. In the last decade, design thinking has become very popular and it is gaining more and more importance within corporates but also for social and public issues in order to design solutions that are better meeting consumers' real and deep needs for meaning. There have been citations and references of design thinking already in the Second World War time, in the 50s and 60s, even though design thinking was meant to be used at that time in technical fields, such as engineering. The Second World War is seen as a trigger for the development of new strategies and approaches to re-think the at the time current society and paved the way for a new approach to innovation and new applications within the industrial field. (Rikke Dam and Teo Siang, 2019)

Design is by definition the “realisation of a concept or idea into a configuration, drawing, model, mould, pattern, plan or specification” (Business Dictionary, 2019) which allows researchers to accomplish the pre-defined purposes and intentions. Design aims at creating new solutions and innovating current ones – what matters is the progress and the evolution of existing states of affairs starting from concepts and research in order to end up with new concrete solutions. Designers are visionaries – they picture new futures and possibilities to themselves and they respond to needs that they perceive as, until then, unsatisfied. Design is the process of conceiving new scenarios and finding a way to develop the plan in order to create a new product or service.

In the 60s, there was the urge to define design with a scientific approach in order to well delineate and specify it. Translating design into a scientific approach would have also signified that design could have been applied to every scientific field and this would have been a great development for research in every industrial and non-industrial field. Nigel Cross, design professor at the British Open University, in his dissertation “Designerly ways of knowing: design discipline versus design science” analyses the attempts made in

the 60s in order to make design fit into a scientific scheme and theory. In the above-mentioned paper, Nigel Cross argues about a necessary revolution to happen in the 60s in order to spread *design science*. Design science is meant by him as a tool to defeat human issues and unmet needs. This newly defined form of design takes place from reasoning, techniques, and technology. When he states that design is a way to defeat existing human needs, Nigel Cross is assuming that economics cannot fix them, while design or, rather, *science design* can. (Cross, 2001)

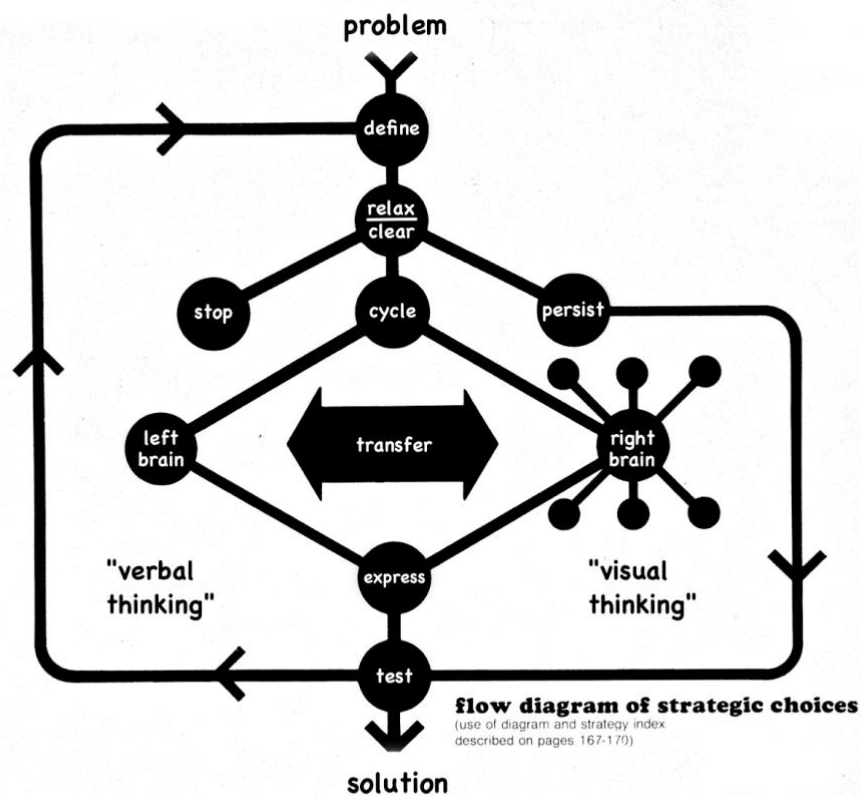
The notion of design was for the first time referenced in a scientific book by the end of the 60s. In this context design was considered as a way to do science and a framework for *thinking* innovation. The author was Herbert Alexander Simon who was an economist and political scientist particularly interested in the decision-making process. His has given a relevant contribution to the development of design, thought as a science.

In his paper *Sciences of the Artificial*, Simon was already mentioning the prototyping and the testing phases that characterise the design thinking process. He mentioned these processes when he was studying artificial intelligence. These studies brought him to write that, in order to understand contexts and processes, researchers must construct a system, in order to study and observe the behaviour of users directly from that. Through this sentence, Simon was already describing the importance of prototyping and observation. Simon, with this statement, wants to communicate that prototypes have to be constructed in order to test them. The final purpose of prototypes is to observe their applications and behaviours in real case scenarios; he refers to prototyping as the construction of the system, namely the *scenario*, as the current design thinking definitions assert. Eventually, according to Simon, designed was defined as 'a way of thinking'. (Rikke Dam and Teo Siang, 2019)

Robert McKim, PhD student in 1957, was hired by John Arnold from the Massachusetts Institute of Technology to carry out studies on human-centred frameworks and creative engineering. McKim was the founder of the "Joint Program in Design", which was putting together different disciplines, such as creativity and art, problem solving, and engineering. McKim in his book "Experiences in Visual Thinking" wrote about the importance of relaxation in the creative process, as an activity for developing *visual thinking*. In the book, McKim analyses the process of thinking to understand how to use its potential. His

approach aims to understand how the visual thinking works, thanks to tools like conception, visualisation, images, and sketches of ideas.

McKim created a diagram describing the process of problem-solving according to two different perspectives – verbal thinking and visual thinking – according to different practices and processes. In the first picture below, McKim illustrates the functioning of the brain and the different stages of thought. Starting from the problem, the first step is to define it. After the definition, researchers should make it clear and understand if they want to go further. If they do so, they can decide to “cycle” and iterate between left and right brain, the first is responsible for verbal thinking, while the latter is responsible for visual thinking. After iterating between left and right – *transfer* – researchers can express their solution and test it, and, if the test gives positive feedback, it is accepted as a solution.



Robert McKim's Flow Diagram of Strategic Choices

Figure 3 – Verbal and Visual Thinking for Problem Solving (Thinking of Design, 2017)

Furthermore, in the following diagram, McKim illustrates the strategy for visual thinking, bringing his observations and understanding through the following visual diagram. The process starts in the middle, putting together three visual activities: imagine, see, and draw. These three abilities make it possible to transform, manipulate, concretize, time scan, modify, and abstract. All abilities that enable to researchers to solve problems through this strategy of visualisation, which ends up with the expression of the solution, or with the cycle and transfer between “left brain” – for verbal thinking – and “right brain” for visual thinking, in order to come up with a solution.

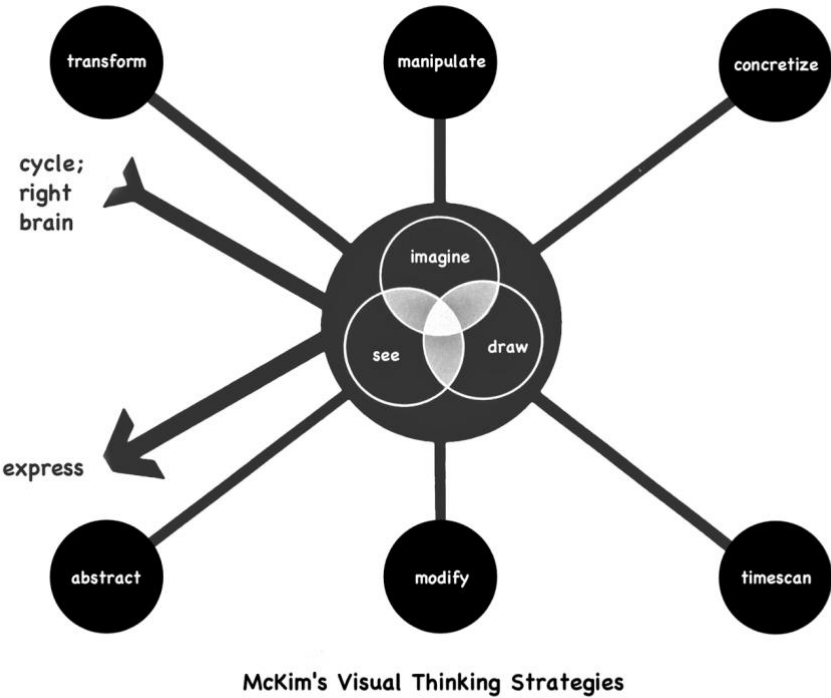


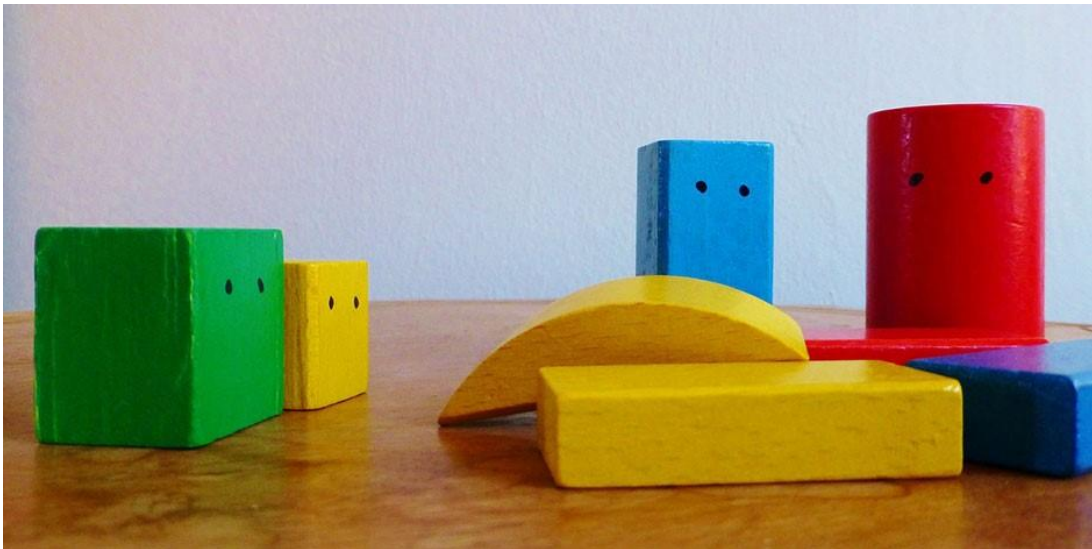
Figure 4 – Verbal and Visual Thinking for Problem Solving (Thinking of Design, 2017)

1.4.2 Design applied to architectural discourse and education in the 70s

Later on, in the 1980s, Nigel Cross, argued about the process of problem-solving. He had a new and interesting approach in order to fully understand the how to solve existing problems. His approach was to study problem-solving carried out by designers and problem-solving carried out by non-designers. This was a starting point to analyse what is exactly the role of designers for problem-solving activities. Nigel Cross believed, indeed, that design is a great tool because it allows to create suitable and valid possible solutions in a rather short amount of time. The reason behind this is that problem-solving activities are not intended to analyse the problem with theoretical methods and hypothesis but they rather focus on a variety of possible solutions and scenarios. Research for solutions is in this sense a way to find suitable and satisfactory solutions and it is not a research with the purpose of finding the optimal one. According to this view, it is easier to find good solutions among multiple ones because the probability is higher, rather than looking for an optimal solution that in the end may not be satisfactory or creative for the final users. (Cross, 1982)

Bryan Lawson, professor of architecture at the University of Sheffield, translated into practice what Cross stated. Lawson published a book about design called “How Designers Think” in the 1980. It is interesting to see how deeply he went into the topic of design already in the 1980, after forty years spent studying the topic of design, and this means that he started in the early 1940s. His thesis was that everyone is a designer and that everyone can rely on his or her own creative mind. He wrote the book after observing how designers work, indirectly, through mere observation, and directly, through interviews. An interesting experiment carried out by Lawson was aimed to observe how scientists and architects approach problem-solving activities and how they generate solutions starting from the same unexplored problem. And the solution is exactly what Cross stated. For the experiment, Lawson selected a group of graduated architecture students, which are in the research the *designers*, and a group of graduated science students, which are the *scientists*. Lawson gave the same problem to solve to the two groups. What the students had to do, was to organize dyed blocks and the students had to follow some rules, even though they did not know some of them. The point of the experiment and what Lawson derived from it is the approach adopted by the two groups. Scientists had a

systematic approach and they were trying to analyse every potential combination, in order to infer a theoretical hypothesis which would give a theoretical means to solve the problem. To the contrary, designers were faster at arranging combinations of blocks and, in front of the different combinations, they were observing if they were fitting the given rules. The results of the experiment show that scientists are oriented at the roots, at the problem itself, while designers, on the other hand were oriented at analysing the possible solutions, creating a lot of different solutions and then selecting the good ones. (Rikke Dam and Teo Siang, 2019)



*Figure 5 – Scientists and designers facing the same problem
(Rikke Dam and Teo Siang, 2019)*

1.4.3 First significant use of the term design thinking in 1987

It was Peter Rowe which for the first time used the term *design thinking* in a significant and meaningful way. Rowe, professor of architecture at the University of Harvard, published in January of the 1987 his book called “Design Thinking”. The book belongs to the architecture field – particularly, Rowe applies design thinking to urban planning and architecture, and he shows how the architectural designer “approaches his task through the lens of the inquiry”. (Rikke Dam and Teo Siang, 2019) Peter Rowe wrote about his book on design thinking that it “is an attempt to fashion a generalized portrait of design thinking. A principal aim will be to account for the underlying structure and focus of inquiry directly associated with those rather private moments of ‘seeking out’, on the part of designers, for the purpose of inventing or creating buildings and urban artefacts.” (Rowe, 1987) According to Rowe, design thinking has the role to understand and make sense of the roots of concepts and after this process of deep understanding and questioning, researchers should focus on trying to find the underlying essence of things in order to create artefacts that are at the same time meaningful and new. (Rikke Dam and Teo Siang, 2019)

1.4.4 The development of design thinking from the 90s up to the present time

In 1991, IDEO was founded in Palo Alto, California, in the United States. Actually, David Kelley, co-founder of IDEO, had his own design company named David Kelley Design (DKD) back in the 1978 – and IDEO came to life only in 1991, when David Kelley decided to merge his company together with the ones of Bill Moggridge and Mike Nuttall. IDEO, nowadays still one of the most innovative design companies on a global scale, was the first company to employ design-thinking to create innovation. This was disruptive in the 90s and IDEO, not only was applying design to reinvent reality and existing products, but the

result of their way to adopt design thinking brought them to adapt this framework to business. They started then applying design to every kind of problem and issues, redesigning the way of looking at innovation. IDEO developed human-centred language and vocabulary, stages of the process of design. (Rikke Dam and Teo Siang, 2019)

One year later, in 1992, Richard Buchanan published the paper “Wicked Problems in Design Thinking”, describing how design thinking was originated. His approach is interesting because he describes the development of knowledge from the Renaissance to the present day. The point of the paper is to show that from the Renaissance on formalised knowledge and procedures became more and more disconnected from each other. Instead, according to his view, design thinking is an approach that puts together deeply specialised knowledge under one approach, in order to apply a wide range of knowledge to problems, according to a holistic perspective.

Later on, in 2005, design thinking was for the first time taught at the Stanford University of Design, now called Stanford “d. school”. This university has always been focused on the development, schooling and enhancement of the design thinking approach and its, since then, one of the main purposes of the school.

Nowadays, IDEO is still playing a central role with regards to design thinking, as well as the d. school. They are spreading design thinking more and more, applying the framework to a wide variety of subjects. Thanks to their work of formalisation, many prominent universities, business schools and innovative companies have started to apply design thinking, with different extents, and also interpreting the methodology to employ it in other fields and contexts, according to their specific needs and problems. (Rikke Dam and Teo Siang, 2019)

Finally, Richard Buchanan, another relevant contributor to the development of design thinking, is a professor of design at the Case Western Reserve University. He started to address human concerns with the approach of design thinking. He published the paper *Wicked Problems in Design Thinking* in 1992, where he described four different orders of design thinking and the different levels they reach regarding disruption and innovation. The first order of design is *communication*, which is characterised by the combination of signs and symbols in order to communicate the intended meaning, for example through graphic or visual design. The second order is *objects and artefacts* and it is about the production of systems or platforms in order to deliver the intended meaning.

Furthermore, the third order is *interactions* and it is about using design for human-centred reasons and in order to deliver outcomes and experiences. The means to deliver experiences is, for example, through user-experience (UX) design, instructional or process design. But the fourth level is what interests us because it is the level where usually *disruption* takes place. The fourth level, indeed, involves systems and environment and employs design on a wider perspective. Design is, on this level, and according to Buchanan, enterprise design, business design and organisation design. Design is produced combining enterprise, business and organisation through the implementation of technology and information designs. At this level, design goes beyond communication, artefacts and objects, and interaction, and this is the reason why it is disruptive. Design lands in systems and environment and this is indeed a much wider perspective that enables design to deliver meanings and to design taking into consideration a wider perspective. Disruption takes place because the impact of design is on a larger scale here, and, therefore, the impact is stronger. Designing systems means designing the public policies, public services, system design infrastructures, public service, and the environment in general. The following picture, that belongs to the paper the *Wicked Problems of Design Thinking*, illustrates the four levels of design thinking.

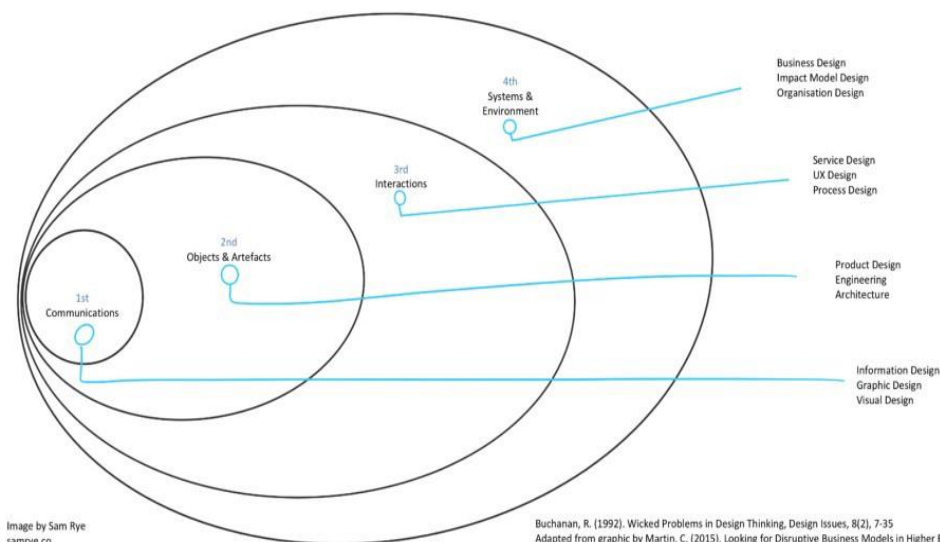


Figure 6 – 4 levels of design (Sam Rye, 2018)

Design thinking is, therefore, the evolution of a way of thinking that has transformed the way we conceive innovation and design itself. The approach is emerged as the convergence of different branches of knowledge combined and put together with a human-centred approach, driven by people with heterogeneous background, such as designers, architects, engineers, and scientists. They have, indeed, brought design to a human-centred perspective and this has allowed the research for new ways to face and develop problem-solving activities.

To summarize, Simon created the concept of design as a *way of thinking* back in the 1969. A few years later McKim developed the topic of visual thinking, describing how the design process takes place in our mind and how it can be implemented throughout visual thinking. Later on, in 1980, Lawson applied design to architecture and urban design, namely, he applied design to concrete problem-solving for the first time, and he published the book called *How Designers Think*, which brings together architecture and design. Then, Cross published a paper about the peculiar and underlying characteristics of design thinking and, with this paper, he began to spread design thinking to a broader public, bringing design to education. The first significant use of the term took place in 1987, when Peter Rowe published *Design Thinking* and it applies the framework of design to architecture and urban planning in order to carry out deep and qualitative research to create meaningful solutions. Afterwards, in the 1980s and 1990s, Rolf Faste started from the research of McKim and, at the University of Stanford, he started teaching design thinking as a framework for creative work. In 1991, David Kelley co-founded IDEO, adapting design thinking to business, and the company is still one of the pioneers in design thinking nowadays. (Creativity Innovation EU, 2017)

1.5 The Process

1.5.1 Theoretical foundations in the process of design thinking

The process of design thinking is characterised by four stages. The process is intended to identify the problem and solve it. There is a tendency on focusing on the second part, problem-solving, and the reason is that this makes the process faster and enables companies to go to the market in a shorter period of time with a new solution. Humans are by nature creative and it is natural to come up with a lot of ideas for a given problem. The issue is that, when researchers do not focus deeply in the definition of the problem, it is unlikely that ideas will be disruptive and able to solve the problem at the same time. Differently, design thinking focuses especially on the identification and the definition of the problem to be solved, or need to be met, before going further with the development of the process and the identification of the solution. This is a salient difference between usual approaches and design thinking. We can say that the identification of the problem and its definition is half of the whole process of creation. In fact, the process is composed by four phases: discover, define, create, and evaluate. (Luchs, 2015)

Design thinking employs a new perspective on problem-solving, involving people from different fields. Design is a framework for creation of meaning. Charles Owen, professor at the Illinois Institute of Design, explains that 'the design process has both analytic and synthetic elements, and that it operates in both the theoretical and practical realms.' (Owen, 1993) He further explains that the analytic phase is mostly about discovery and understanding the context, while the synthetic phase is mostly more creative and focused into making. Iteratively, researchers move from the realm of practice to the theoretical one, translating concrete sources into ideas, and, afterwards, converting them, again, into practice, as artefacts.

To summarize, problem-solving is a learning process that involves researchers in order to approach the problem iteratively, moving back and forth between the concrete and abstract realms. This approach is a learning process that enables researchers to deeply understand the context where the problem stands.

The innovation process is composed by four main stages which are observations, frameworks, imperatives, and solutions. As the diagram below clearly shows, the process starts with *observation* of the context which lays in between concrete and analysis. The second stage is *frameworks*, which aims to derive insights from the observation stage. And this second step starts with analysis of the observations and moves towards the abstract realm, where the process goes on with the phase of *imperatives*, which consists in the generation of ideas, starting from an abstract realm towards a process of synthesis. Here, the process of synthesis entails the transformation of multiple and abstract ideas into a clear and meaningful concept. The next and last phase of the process focuses on *solutions* through experiences. This stage starts from synthesis in order to land into a concrete outcome. This means that from the synthesized ideas deriving from the previous stage of the process, solutions are carried out through the experience of the new concept within the reference context. Ideas finally take a shape and they are translated into prototypes, which are real and tangible, in order to test and derive feedbacks from them. (Beckman & Barry, 2007)

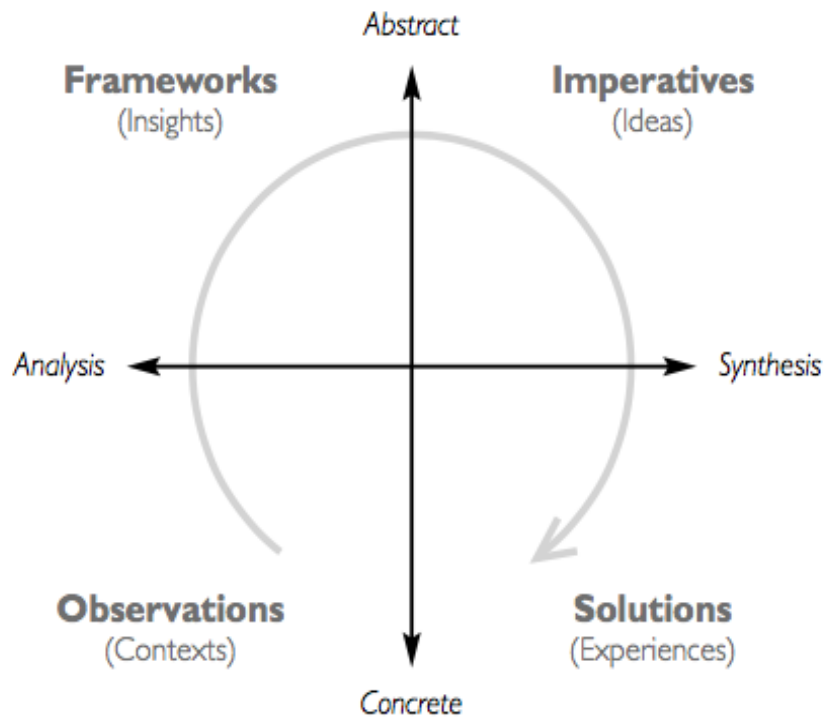


Figure 7 – Design thinking process and its phases, between concrete and abstract (Owen, 1993)

Source: Words in parentheses are Owen's. Charles Owen, "Design Research: Building the Knowledge Base," *Design Processes Newsletter*, 5/6 (1993) and Charles Owen, "Design, Advanced Planning and Product Development," (October 26, 1998) and *International Symposium: Nuevos Metodos y Tecnologias para el Diseño de Productos*, Santiago, Chile (November 12, 1998).

1.5.2 The importance of understanding and discovering the surrounding environment

Discovering is the first phase of design thinking and the key focus of this phase is to understand the challenge to solve. This phase is the beginning of the process and,

therefore, it gives the basis for all the rest of the process. Understanding the problem is 'imperative to identifying and creating a solution, and the degree of understanding goes beyond that of conjecture or your previous history with challenges of a similar nature'. (Ingle, 2013) This means that problems have to be tackled from a totally new angle, without the influence of previous work and researches. It should be like a new start where researchers should be open to explore new perspectives, mindsets, and attitudes. Most of the times, teams who want to innovate and create new products, are immersed in a reality full of products and technology. The risk is that this reality makes them think in a certain limited perspective, not allowing them to look for disruptive innovation or for delivering meaningful and original solutions into the market. Often, it happens that research is biased because of the influence of the existing products and beliefs, and this make researchers end up with incremental innovation, instead of radical innovation.

The goal of the discovering phase is to derive customer insights that will further developed in the following phases. (Luchs, 2015)

Michael Luchs, professor and founding director of the Innovation and Design Studio at the College of William & Mary's Raymond A. Mason School of Business (Luchs, 2015), wrote in his paper "A Brief Introduction to Design Thinking" that 'a quest for breakthrough ideas often begins with an open exploration of customer needs – especially latent, undiscovered needs that may be difficult to articulate – also referred to as customer insights.' (Luchs, 2015)

Meaningful and original insights can be generated through qualitative research which make researchers to immerse in the reality in which they want to explore new problems and solutions and this, as well, enables them to get to know the users better and to carry out original insights, thanks to empathy with users. Empathy can be achieved through the involvement of designers in the context, which is the environment and the people all together, with their beliefs, experiences, cultures, behaviours, perceptions.

The first phase is therefore data collection through qualitative research directly in the field. After collection, designers have to synthesize the data in order to make sense of them and see what they lack or if they have enough already. A particular feature of design thinking is that, once the team has gathered information during data collection and has synthesized the information, the process of data collection and synthesis is not done.

Design thinking is characterised by iteration between these processes, going back and forth to derive always improved and expanded data to derive from them always more accurate insights. Data synthesis is, indeed, the process of deriving insights and make sense of data that have been collected, summarizing them. Since data collection is in its nature qualitative, the process of synthesis is meant to translate the material, in form of surveys, photos, recordings, videos, into specific and meaningful insights. Some tools are for example 'coding transcripts, drafting personas and empathy maps of archetypical customers, and journey maps that describe the customer's current or ideal experience. The process relies on the team's flexibility to research because of the variety of data that they collect and the time span during which data are collected. Once the team is satisfied with the insights collected, they can go further with the process to the next stage. (Luchs, 2015)

'The time, place, conditions, and circumstances within which aspirations are conceived, decisions are made, and product usage takes place have an impact on the levels of satisfaction experienced in the aftermath. Research practice that ignores context is doomed to misunderstanding and misrepresentation.' (Mariampolski, 1999) Context can be understood through ethnography, observation and research in the field, among other methodologies. Researchers should go at the roots of products and consumer's needs in order to understand how the product is used and which benefits consumers are looking for in a specific context. And what should the observer do when actively researching? He should listen to stories from people, that 'involve contradictions or workarounds, spoken and unspoken norms'. (Beckman and Barry, 2007) And, in order to evoke the stories, the researcher should be 'naïve, ask probing questions, and strive to understand why.' (Beckman and Barry, 2007)

1.5.3 Process of synthesis: frameworks and insights

After the first stage of data collection, researchers move on to the next phase from concreteness to analysis, in order to connect the information available shaping and

reshaping the information in order to determine models and behaviours, with the purpose of developing the understanding of what consumers value and how they make senses of the product. A big volume of information needs to be processed and this allows to see if some relevant data are missing and if the quality of information is sufficient. Researchers start having a clearer idea of the context and how the problem is defined, and this brings them to developing new features that may give them new perspectives and angles on the context, which, in turn, will give the basis to end up with an original solution. (Beckman and Barry, 2007)

Researchers, in this *framework* phase, are looking for patterns and interesting stories and anecdotes told by the users, they observe their behaviours within the considered context, in order to find unmet needs and potential meanings to deliver to the users for a more meaningful consumer experience and use. According to Beckman and Barry, the team of designers 'must develop a narrative or story about how users solve the problem in question today, how they incorporate the present solution in their lives, and what symbolic meanings that solution holds for them.' (Beckman and Barry, 2007) Once researchers have without any doubt understood and made sense of the story, they can move on within the process with the domain of synthesis.

There are a lot of tools in order to derive insights from collected data. One is, for example, the identification of interesting anecdotes. Stories can indeed bring up feelings and emotions of the characters, and, therefore, insights can be derived in terms of emotional bond between people and the context. Another method is to outline needs of people. The purpose of this approach is to spot new dimensions of behaviours and practices, in order to draw two by two diagrams, that are a useful visual tool for designers about how relevant elements observed are scattered in the diagram. Another approach is to start from the data to draw timelines. The time span might differ depending on the needs of designers and it can represent a day, or a year, or any other time span that makes sense to researchers.

These are some examples of tools that can be employed to carry out stories starting from collected data. This part of the process is not so easy because it calls for the analysis of a big amount of data that need to be processed and the point is that they are not quantitative but they are qualitative and they take very different forms. This takes, in turn, flexibility,

abilities to think out-of-the-box, understanding of the context, in order to derive patterns and models to derive, in the end, valuable and original insights.

According to Sarah Beckman and Michael Barry, in this part of the process, the learning technique is the *assimilating* one, as shown in Figure 8. The diagram shows different ways of learning that are needed to carry out the identification and solution of a problem. Assimilation lays in between *reflective observation* and *abstract conceptualisation*, and latter is, indeed, the purpose of this phase of the process of design thinking. One of the characteristics of design thinking is to employ people with different learning style so that they can complement each other during the different phases of the process. (Beckman and Barry, 2007)

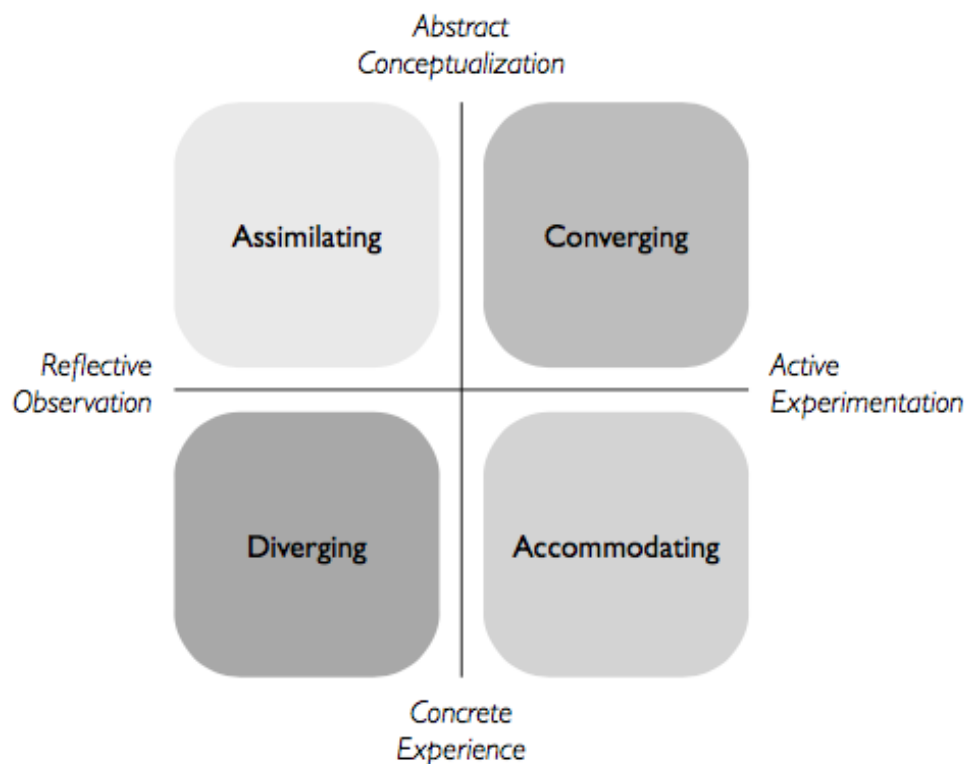


Figure 8 – Learning Styles between experience, observation, conceptualisation, experimentation.

Source: Drawn from D.A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (New Jersey: Prentice - Hall, 1984); Alice Y. Kolband David A. Kolb, *The Kolb Learning Style Inventory* (Hay Group, 2005).

Assimilating learning style involves people that have skills for logically processing data, seeing them from different angles, drawing diagrams and visually and creatively seeing what the patterns are. Kolb, who defines the four leaning styles, stated that assimilators have a tendency to be 'less focused on people and more interested in ideas and abstract concepts.' (Kolb, 1984)

After this part of the process is carried out, the team has gained enough insights to move on with the process. The insights identify the need that users have, and they must express original understanding of the environment, before the team moves forward with the next stage, which consists in the generation of ideas.

1.5.4 Process of creation: imperatives and ideas

After the collection of insights in the previous stage, it is time for the innovators to use them in order to generate ideas. In this phase, the purpose is to gather *imperatives*, which are the synthesis of the insights. In other words, they are the value proposition of the innovation process. The value proposition is the assertion of the intention that innovators want to achieve thanks to their ideas and it is the promise that the outcome of the innovation process will have certain characteristics. The value proposition must promise benefits that are new and original in order for it to be valuable and effective. The value proposition should be the 'description of the tangible benefits customers will derive from using a product or service.' (Beckman and Barry, 2007) Therefore, this proposition is

different from the description of technical features that the product must have in order for it to be innovative.

The learning style is here the converging one that lies in between abstract contextualisation and active experimentation. Indeed, in this phase of the process, the purpose is to converge from insights about the problem and the context to imperatives and ideas. It is in this phase that innovators establish the most relevant targets and aims that will have to be achieved through the design of the final solution. This is a crucial phase that paves the way for the remaining part of the process. This phase is according to Sara L. Beckman and Michael Barry focused on determining the *imperatives* which come from the awareness of what is lacking in the context for the users involved. They can be in form of principles and rules that need to be followed, or they can represent specific needs of customers that have to be met through the innovation process, and they should show the understanding of what they are missing within the context. (Beckman and Barry, 2007) Imperatives must provide precise information and guidelines for the development of ideas and solutions and they can be in form of sets of specified user needs or in form of design guidelines or, in the end, as value propositions. This phase is the outcome of a deep qualitative understanding of the context and, therefore, the research team will start from this phase to immerse in the problem-solving phase, while the previous phases were about understanding and problem-identification. The previous phases were focused on divergence, that is going out in the field to live the context and gather data through direct and indirect interactions with the users. Converging means going from the wide realms of data and insights to the ones of defining specific rules for the process. The style of learning is here the converging where the 'dominant learning abilities of those with the converging style are abstract conceptualisation and active experimentation'. (Beckman and Barry, 2007) People with converging style of learning are good at matching practice with theory and they can easily solve problems for abstract problems. They are mostly goal oriented with a drive for pushing the process forward and to move on to the next phase which is the one about solutions and experiences, which determines the outcome of the process. (Beckman and Barry, 2007)

1.5.5 Process of evaluation, solutions, and experiences as last phase of the design process

Eventually, the process comes to an end with this fourth phase of evaluation. Evaluation represents the phase of finding concrete solutions to the problem and researchers, therefore, need to move back to the concrete realm in order to generate solutions to the problem, responding and fulfilling the imperatives. After the solutions has been created in form of a prototype, they need to be tested with potential users in order to obtain feedbacks directly from people interested in the product and that are willing to give advices and impressions about the trial. The team of researchers can come up with several solutions and then test them in the market to select, in the end, the one that is worthy to be taken forward. Furthermore, feedbacks need to be generated through disparate mechanisms so that they can give a general idea about what potential users think. The mechanisms to generate concepts and solutions can be both rational, spontaneous or perceptive. For example, rational and logical procedures generate a set of ideas according to the different functions of the innovation that needs to be carried out. Then, researchers create ideas for each of the function and, in the end, solutions are put together to create a set of possible alternatives. On the other end, the perceptive approach can, for example, incorporate brainstorming, which can provide researchers with a broad series of solutions.

The next step is the choice for a specific possibility. This part of the process is rather informal and, most of the times, it changes according to the type of organisation at hand. The easiest way to carry out this process is to arrange of the criteria that, at least, must comprise the imperatives, and possibly further criteria, which can be internal and external (additional services). The next step is to rank the concepts according to the stated criteria. This process is important because it brings up ideas, problems and conversations about the whole process and its outcomes.

Subsequently, next comes the testing phase, which is aimed at assessing the concept. Researchers should understand what they want to derive from the test of the prototype and, according to this, they should design it, in order to gain the feedbacks that they need. This expects researchers to generate a prototype, which will be assessed with potential

users of the product or service. Prototypes can be quick and crude and they should serve just to communicate the idea of the new product or service. If they are good enough to communicate the concepts to potential users, and, users understand and are able to interact with the product, then researchers are able to collect valuable feedbacks and the process can move forward.

A particular feature of design thinking is that the process is exceedingly iterative. This is why researchers must not stop at the first outcome they achieve but they must keep iterating in order to enhance the product more and more, to meet the needs of potential consumers at their best, creating always different combinations and arrangements between options. The process ends when researchers are satisfied with the results of the testing process and they have a solution to the initial problem. Iteration means also that researchers might need to move back to redefine insights and imperatives, if needed. Eventually, we can interpret this part of the process of testing and finding out. (Beckman and Barry, 2007)

Within this part of the process the style of learning associated is the *accommodating* one, which stands between active experimentation and concrete experience as learning abilities. People with these skills are able to learn from communication events, involvement, and background, and they tend to behave and make choices through their feelings.

1.5.6 Associations and implications of the design thinking creative process for companies, organisations, and teams

As Sara L. Beckman and Michael Barry wrote in their book *Innovation as a Learning Process: Embedding Design Thinking* that there are four different learning styles that people own and implement in their learning process and these styles are mostly related to how people think and how they process information, given a context, a formula, a picture, a story, and so on. In the abovementioned book, Beckman and Barry integrate the

learning styles with the process of creative and disruptive innovation and this provides managers with insights on how to arrange the team according to the different skills that team members have. Often, teams are organised with a combination of people with knowledge belonging to different fields, such as management, engineering, mathematics, design, business, and so on.

Several studies show that combinations of people with different skills and knowledge are very relevant for innovation, and, more specifically, teams should be heterogeneous. Research has found evidence that within teams where there is a combination of people with the four different learning styles, then they have abilities to be better than team members with more homogeneous skills. This result is interesting and it must be taken into consideration when it comes to creating a new team or adding new people to an existing one that maybe lacks some of the learning styles, and these results are not only related to innovation studies. (A. Kayes, D. Kayes, Kolb, 2005)

Design thinking is a chaotic and iterative process and researchers cannot just jump straightforwardly from problem-identification to problem-solving. They must consider the context in a wide perspective, and the key point here is that the team must have heterogeneous skills in order to be able to catch different layers within the context and solve the problem with different sets of skills, since the process has very different phases, which require combinations of different abilities and experience. This can be achieved through the employment of people coming from different countries, with different cultures and backgrounds, and with heterogeneous educations and learning background. Nevertheless, the four learning styles are not the only approach for designing a team. There are different approaches that give importance to different personality traits. For example, another approach gives importance to 'tolerance for ambiguity' and 'need for closure' (Beckman, Barry, 2007) People who do not have much or enough tolerance for ambiguous situations, consider these situations as a menace and they cope with this looking for positive assurance by relying on past information that was stated as correct and not unquestionable. Correspondingly, people who are comfortable with closure, because of their nature or because of the situations where they are in, tend to grab the information that first come to them in order to fulfil their desire for safety and they close themselves in front of additional information, choosing the first that come to their hands. (Jost, Kruglanski, Sulloway, 2003) According to C. K. Joyce, who wrote in the book

“Cognitive Style Diversity and Culture Formation in Team Innovation”, he explains that there is evidence that team of researchers who have both these traits, high and low tolerance for ambiguity, perform better than teams with less diversity among members of the team. (Joyce, 2006)

Another approach for designing a team is by combining people who have completely different approaches with regards to how they process information, which can be through an abstract approach or to an approach based more on feelings and natural instincts, rather than through rational or conceptual approaches. People deal with information in many different ways, and even people who tend to use a specific approach have, indeed, different ways to process with a tendency for one of the four abovementioned learning styles.

People might process information by means of symbolic depiction or through an abstract approach, or, on the other end, they might process information through straightforward sensations and feelings. Furthermore, there are people who prefer to observe from the outside, and other people who prefer to put themselves inside contexts and experience it. These are all different frameworks that can be employed and people tendentially move towards one of the two alternatives. Therefore, when teams are working throughout the innovation process, at some point they have to choose which approach to employ, and they can change and adapt themselves during the different phases of the process, when maybe there is the need to move to “the other side” for certain desired results.

Another approach to design a team might be according to the different roles that members of the team have in the innovation process. D. McMurray in his book *Learning Styles and Organisational Behaviour in Japanese EFL Classrooms* wrote that ‘assignments on teams might be best made based on learning style: leader (concrete experience), artist (reflective observation), writer (abstract conceptualisation), and speaker (active experimentation). (McMurray, 1998) Therefore, according to every different phase of the process, different members of the team take management and bring the team forward by using their technical and personal assets. This makes the hierarchy flat because the leader changes at every step of the process according to the different skills required.

The need at the foundation of the innovative process is to understand how it works and how to involve team members in this iterative and versatile process that is design thinking. The innovation process requires flexibility and a deep understanding of the

framework of design thinking. Flexibility entails the 'need to move between the abstract and concrete and between analysis and synthesis to execute that process.' (Beckman, Barry, 2007) Furthermore, the process needs to be understood in order to put together the right arrangement of people with heterogeneous salient skills, according to the approach that the innovation team employs. Finally, the leader of the team must be able to deeply comprehend the process in order to incorporate and consolidate the different skills of the team members. This is a valid approach that innovators can employ in order to design the team and manage it through the different phases of the process (Beckman, Barry, 2007)

Chapter 2

Design thinking for competitive advantage

2.1 Hierarchy of different types of innovation

Design thinking is a tool for innovation, as it aims at meeting needs that were previously unmet and unseen. Innovation can be incremental, radical, or design-driven. The aim of design thinking is to achieve design-driven innovation, which is innovation of meaning. In this sense, design thinking is disruptive because it changes the concept of existing things or it creates an artefact or service that is especially meaningful for the user. In any case, every type of innovation, as long as it has a value for the market and the economy, leads to growth. Design thinking is key to innovate because it represents a resource to make companies gain competitive advantage which is most of the times sustainable over time. Liedtka, professor at the Darden School at the University of Virginia and writer of the book “Designing for growth: design tool kit for managers” together with Ogilvie, states that design thinking ‘is a process of continuously redesigning a business using insight derived from customer intimacy. It’s an approach that addresses product, process, and business model innovation.’ (Liedtka, 2011) He states that design thinking has many different possible applications for innovating and innovation has to be sought repeatedly over time, it is not something that must be achieved once for good. Furthermore, another key fact that Liedtka points out in the sentence is that the framework of design thinking approaches customers in their intimacy because the aim is to deeply explore needs of potential users in order to come out with the identification of problems that will be solved

during the process of design. Liedtka and Ogilvie wrote about successful managers using design thinking as a tool to redesign their business and they show how continuous innovation driven by design is a tool for sustainable competitive advantage. (Liedtka, 2011)

Roger Martin, specialist in design thinking, in 2006 stated that there is an urge for a revolution of design in the management and business field. He stated in his book *Design Thinking and How It Will Change Management Education: An Interview and Discussion* that nowadays people do not have to comprehend designers and their activity better, but they, on the other end, they have to be designers. He writes 'today's business people don't (just) need to understand designers better. They need to become designers.' (Dunne, Martin, 2006)

Brian Leavy, professor of management for strategy at the Business School of Dublin and co-author of *Strategic leadership: governance and renewal* wrote a "masterclass" paper about strategy and leadership describing the different ways to innovate and the hierarchies involved when managers want or need to innovate a business. He states that innovation is a compelling matter for managers, especially in the last decades, and he explains this and the reasons why innovation is so important through a hierarchy of innovation. The concept of hierarchy of innovation was developed by Gary Hamel in the book *The Future of Management*. (Hamel, 2007)

Gary Hamel shows that there are four types of innovation ordered in a hierarchical way where the upper levels designate higher levels of value creation and sustainable competitive advantage, as it is shown in the following figure. The figure shows the different levels of innovation that have different impacts on business and management because they affect the business to different extents.

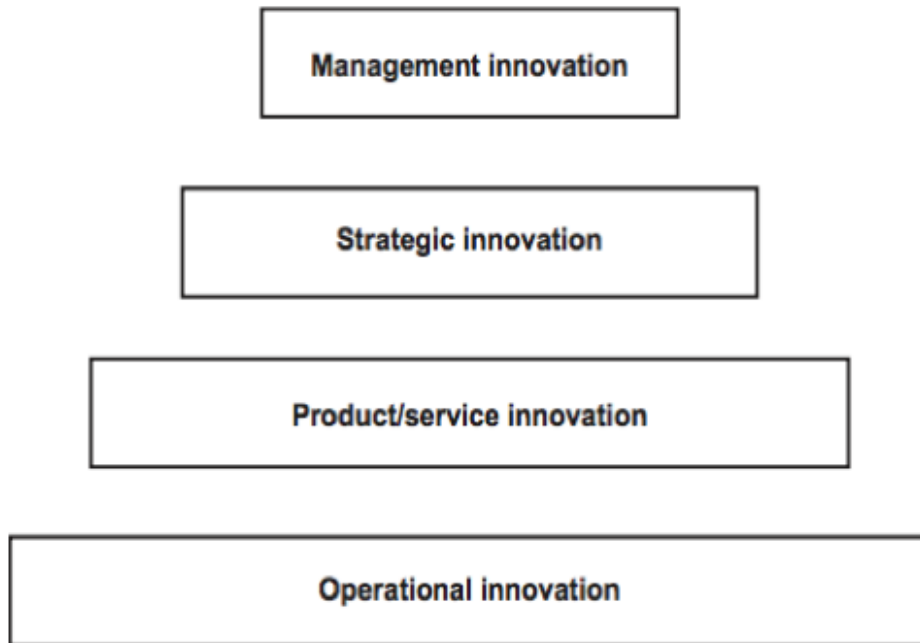


Figure 9 – Stack of different kinds of innovation (Liedtka, 2011)

At the lowest point of the diagram there is operational innovation, which consists in innovation in the ways to accomplish better degrees of performance in operations within a business or organization. Operational innovation is not the enhancement of operations or the optimization of them, it is rather a framework to find new methods and techniques to supply products and services of highest quality at a moderate financial value. Strategies are supervised at the company level, and, differently, systems are controlled at the level of organization, which is closer than the company level. An example brought by Maurice Spann in his book *Business Process Management*, is the innovation process carried out by

Wal-Mart. The company adopted in the late 80s the strategy of cross-docking, which consists in the unloading of products from the coming supplier and the direct loading of these products in the departing trucks in order to skip the process of warehouse and storage. The cross-docking method has a lot of advantages for a business that can implement it, because it reduces the costs for warehousing, organizing the material, and for employees storing the products, and all these reasons result in a relevant saving in terms of expenses. (Spann, 2015)

Therefore, we have seen that operational innovation is at the lowest level in the hierarchy of the different types of innovation. The next type of innovation is product or service innovation, which leads also to a short-term competitive advantage compared to other kinds of innovation that I will describe later, and the favorable outcome within the market or industry does not necessarily belong to the innovator. Product innovation can consist in the enhancement of an existing product in terms of technical features or the enhancement of the performance of that product together with new features, or it can consist as well in the advancement of a new product itself. Product innovation can be incremental or radical and the drivers for this kind of innovation can be technological developments, alterations in users' needs, or out-of-date design look. On the other end, process innovation is about the innovation of processes within the company, which can be incremental or radical improvements. Processes are, for example, the technologies adopted by the company, the machineries, the abilities of workers, and the combination of these assets all together. The more processes take place in a company, the more they can be optimized overtime, and the more a company depends on them, the more it should focus on constant innovation of every process existing within the company. Process innovation can consist in the adoption of new assets or machineries used to produce, improvement in the mechanisms, techniques, and processes related to suppliers and purchasers. Also, improvement in processes can be carried out through the adoption of new software, new skilled workers, and other intangible assets. A difference between product and process innovation is that process innovation takes place within the company and it is not visible from the outside and, also, it is an optimization of the activities of the company. Process innovation has a lower risk than product innovation because it takes part within the company and it does not take into consideration customers behaviors. On the other end, product innovation is something visible from the

users and the consequence is that there is an increase in sales and in the profit of the company, if it is successful.

Hamel ranks at the second place of the hierarchy strategy innovation, which is more sustainable than the abovementioned types of innovation, of operations, products, and services. Strategy innovation is harder for competitors to copy, and, therefore, it has more sustainable advantages. Strategy innovation is crucial in order to accommodate the always changing development of technologies. It is important to understand that strategic innovation does not only refers to improvements in goods and services, but it takes place especially at the level of the innovation of projects at the level of executives and managers of the business. Strategy innovation is, for example, about the choices made in terms of redesigning and reinventing products, keeping up in competition, developing new business models according to the changing needs of the business in the market, optimizing systems and techniques, positioning the brand of the business according to the different needs of users, improving the effectiveness in relation with suppliers and the market. These improvements and choices can create a competitive advantage that competitors can potentially imitate in a long period of time.

At the top of the hierarchy, Hamel positions management innovation. The definition of innovation management is the following: ‘the systematic promotion of innovations in organizations and includes tasks of planning, organization, management and control’ (Hengsberger, 2018) Management innovation refers to different aspects of the company activity and it can take place for example by getting in new markets with new products or services, improving them to stick out from the rivals, enhancing internal processes in order to optimize the internal activity, reducing costs and being more competitive in the market, or, finally, innovating the business model in order to gain more competitive advantage by changing strategy. (Hengsberger, 2018)

Hamel places strategy and management innovation at the top because they have the power to change the position of the company in the market in a long-term perspective. According to Leavy, these types of innovation lead to disruptive innovation, blue ocean strategy, market-busting, co-creation of value with users, design-driven innovation, and innovation of management. Disruptive innovation has, as an outcome, the formation of additional demand, ‘by trading-off traditional dimensions of performance, such as features and functionality, for others like accessibility, convenience, affordability or

simplicity of use' (Christensen, 1998) The blue ocean strategy is instead a strategy to create new space and demand within the existing market, it is the creation of new space where there are no competitors. Moreover market-busting is a strategy to create 'new growth opportunities through redefining an existing market's traditional profit drivers.' (McGrath, MacMillan, 2005) Another strategy is the one of value creation together with the users or, better, co-creation, and this approach leads to more solutions for the users that are more user-friendly and more in accordance to their needs. Another approach that I have deeply described in the section of chapter one on design-driven innovation is through this type of innovation, which consists in changing the meaning of product at an emotional level. Finally, the last strategy described by Hamel is the one of management innovation that aspires to create sustainable competitive advantage 'through the creation of high-engagement, high-performance organizational cultures.' (Hamel, 2007)

2.2 Development of innovation through existing knowledge

Brian Leavy in his paper *Design Thinking – A new mental model of value innovation* describes a series of notions that give managers tools for innovation. The notions are 'the knowledge funnel, the distinction between reliability and validity, and abductive reasoning.' (Leavy, 2010) It was Roger Martin to develop the concept of the knowledge funnel in his book *The Design of Business* to show the function of design in the context of innovation. As it can be seen in the picture below, there are three subsequent steps in the funnel, which are mystery, heuristic, and algorithm. The aim is to bring knowledge from the first stage of mystery to the next stage of heuristic and then to the final stage of algorithm, and through these stages information changes and is selected step by step to bring value in the end.

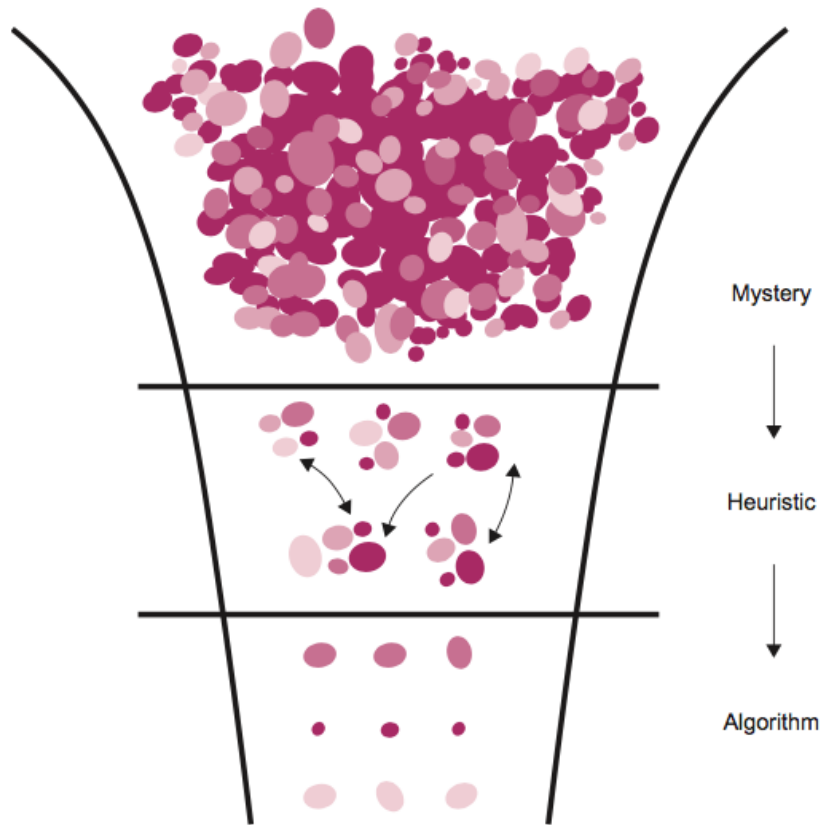


Figure 10 – Knowledge Funnel (Martin, 2009)

Roger Martin explains the concept through the company of the brothers McDonald's, which started out as a drive-in restaurant in the 1940s in the United States. The restaurant started like this and then it has been optimized in order to reduce costs and time of waiting and they were able to offer cheap food quickly, this was their value proposition. The innovator was a supplier that saw a lot of potential in their idea and he made the system of production and sale smoother and more efficient, by organizing it with a strict series of rules that would allow them to end up with an efficient way to make hamburgers, manage workers, pick places for the activity, and to transform the single business into a

franchising. Martin describes this story as an example of application of the knowledge funnel. Why? The story of McDonald's shows how the innovator, identified the opportunity to potentially enter a new market, by solving a "mystery", as it is defined by Martin. The mystery was 'in this case, what the impact of the postwar car boom might be on American eating habits?' (Leavy, 2010) The mystery is the starting point of the process and it consists in the market opportunity. The next step is to conceive a concept for solving the mystery, which consists in turning the idea or concept into a heuristic experimentation. A heuristic approach suggests that the process is made of experimentation, iteration, exploration and going back and forth to define and redefine the problems that need to be solved, through trying out and making mistakes. In the case of McDonald's, the heuristic assertion was that Americans were looking for food that was cheap, fast, and rich in taste. Consequently, the next step is the algorithm, which consists in the codification of the problem with algorithms or formulas in order to make the solution for the problem repeatable and easily solvable. In the case of McDonald's, the supplier did this by systemizing the mechanisms to produce and sell the burgers in a standardized and very efficient way, optimizing every part of the process.

The competitive advantage of McDonald's was that their service was fast, convenient and tasty, and this was indeed their value proposition, which allowed them to reduce costs, and therefore prices, achieving more and more efficiency. In his paper *Design Thinking – A new mental model of value innovation*, Leavy raises the question about why companies worldwide are not able to copy McDonald's way to triumph thanks to the knowledge funnel of mystery, heuristic, and algorithm. Design thinkers have answered that disruptive innovation is not just about that but it comes when two extra processes come into play and these are *exploration* and *exploitation* and, in order to create innovation, they have to be applied at the same time. Exploration is the process of looking for new knowledge, while, on the other end, exploitation is about managing every step of the process and exploiting the information belonging to each step. Leavy explains that exploration and exploitation have to be carried out at the same time and this requires a set of different skills. 'Exploitation is associated more with analytical thinking, while exploration tends to be more intuitive'. (Leavy, 2010) If the focus is only on exploration, then the outcome is not stable and not able of being used in a large scope. On the other end, a focus on exploitation ends up with inactivity and "stagnation". (Leavy, 2010) It is

here that Martin gives a solution that is design thinking as a tool able to help companies 'both hone and refine within the existing knowledge stage and generate the leap from stage to stage' (Martin, 2009) on a regular and steady basis. (Leavy, 2010)

2.3 Reliability and validity

Two very important concepts for understanding what Roger Martin explains in this paper about successful innovation are reliability and validity. He explains that, in order to have disruptive and sustainable innovation, reliability and validity must take place at the same time, and this is what is tricky about the innovation process. In fact, there is often a tendency to focus too much on one of the two aspects, neglecting the other, and the result is not as satisfactory as in the case where they are implemented together and equally. Martin believes that the differentiation and understanding of these two concepts are fundamental to implement the design thinking process for radical innovation. In his book *Tough Love*, Martin states that, in order for an organization to be successful in the long-term, 'a company needs to succeed at both', validity and reliability. 'It must mesh the classical workings of a traditional organization with the prototypical features of a design shop.' (Martin, 2006)

Reliability and validity tend to be present together at the same time when it comes to organizational processes. According to Martin, reliability is more valued by executives, while, on the other end, validity is more valued by designers. Designers have a bias for validity because they use their imagination for creating something new, improved, and superior, while executives tend to prefer something robust, systemic, and reproducible. In fact, a process more conforming to reliability has as a result something easy to foretell and that can be replicated over and over again. On the other end, a process more conforming to validity is for example related to the comprehension that design thinkers have about consumers and their environment, and they derive ideas from this that they cannot empirically test. The two processes have two very different approaches and this is

why they should, according to Martin, be developed at the same time and to the same extent. (Leavy, 2010)

Design thinking allows companies to go through the knowledge funnel and to develop an innovative outcome through reliability, rather than validity. What reliability allows companies to achieve is the creation of coherent, logical, and easy to foretell results. On the other end, validity aims to create results according to specific objectives. For example, the R&D department concerns validity because of its exploratory nature, while many companies do not have a department for reliability. Martin explains the reason, which, according to him, is related to the fact that companies are not able to successfully implement reliability and he explains that companies are good and willing to create and develop reliable outcomes because they are well-known within businesses. And, on the other end, businesses are not experienced to deal with other thinking approaches that are more creative, such as brainstorming, which could lead to valid results, but these approaches are underestimated within the nowadays markets.

Leavy describes three kinds of approaches that should be applied by managers. The most common are deduction and induction. Deduction is the process of using logic in order to move from the general to the particular. Differently, induction goes the other way around starting from the particular to end up with the general. Deduction is the process of foreseeing results starting from existing premises, while induction starts from existing scenarios and facts to derive a valid rule that applies to them. Deduction and induction are both related to the 'exploitation of existing knowledge.' (Leavy, 2010) However, these approaches are not enough because they are not able to focus on the exploration of new knowledge. Leavy explains that a third type of knowledge should be implemented and it is the abduction type of approach. Abduction is a way to reason that focuses on what something potentially could be, and not on what it is or it used to be. Potential solutions can be visualized through the origination of new information, and with the visual help of prototypes and applications in the field. The idea is to work with new concepts and applications, instead of focusing on previous abstract or concrete scenarios, artefacts, and data, and this is the reason why this new approach of thinking that is abduction comes into play in order to create radically new solutions. It is Martin that states that abduction is what designers need to apply in order to use design thinking and he connects this view to the description that Tim Brown, chair of IDEO, gave about design thinking, which is 'a

discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity.' (Brown, 2008)

2.4 Procter & Gamble and its design strategy

Procter & Gamble, one of the most successful companies in the market nowadays, has not always been at the top of the market competition over time but, indeed, it has struggled to find its way out of a crisis that was making it constantly lose market share. In fact, the company faced in the last decade of the last century a crisis that kept taking place until the early 2000s. Procter & Gamble is a diversified company in terms of brands and most of them were, at that time, losing power in the market. Furthermore, growth was really slow, profits were not increasing, and this stagnation was taking place more and more over time. Subsequently, in 2000, Alan G. Lafley became chief executive officer of the company and he brought the change that the company had needed for several years by then. It did not take long until the company started flourishing again, as never before in its long history. Lafley made it to change the whole approach that was adopted until then to manage the business. In 2003, profit started increasing again by 15 per cent per year and the leading brands were gaining more and more market share. At the time, managers were foreseeing a steady and sustainable growth. Later on, until 2008, 'revenues grew by 94% from \$42B to \$81B, with net profits from continuing operations growing by 140% from \$4.6B to \$11.8B.' (Leavy, 2010) Growth was very fast and it restored the market share that the company had previously lost and brought P&G even to a better position than ever before.

Undoubtedly, many factors occurred for such a growth and it is not attributable to a single one because this outlandish growth can only be the result of different reasons. In any case, Martin, which took part actively in the organization at the time as a consultant, assumes that the main reason of such a successful change was because the company changed its approach into a *design organization*. In fact, only one year after Lafley was CEO, he chose

Claudia Kotchka as the first chief executive for innovation and strategic design. She was responsible for changing the old approach into a new one that would embrace design as a fundamental approach. This was a real transformative process that changed the company radically and made it succeed in the long term.

Leavy, in his paper, describes the most important aspects that made the company be a design thinking organization. Lafley made sure that design would be one of the main pillars of the new P&G organization with the awareness that was something to be developed over time. Another factor was to create and implement a team of freshly graduated designers who could master design within the company, and, furthermore, they would be part of the business team and would develop connections with external organizations and agencies in order to have external feedbacks and contribution with always updated strategies and new knowledge. Martin and other collaborators of him created the project *Designworks* in order to spread the approach of design thinking to all the people working for Procter & Gamble on a global scale.

The innovation strategy of P&G which was called “Connect and Develop” was a way to move ideas within the knowledge funnel from the stage of mystery to the heuristic one, in order to move then to the algorithm stage where innovation is scalable and widely spreadable, by gaining ideas in order to allow opportunities to take place in the last stage of the knowledge funnel. Furthermore, another project which was named *Brand Building Framework 1.0* and it was carried out in order to bring design and projects to junior younger managers so that costs on professional designers could be cut just by giving these tasks to junior managers.

Considering the success that Procter & Gamble has had mainly for shifting its strategy to design, most of the companies should adopt this perspective as well in order to have a bigger impact in the market. Martin explains that companies tend to success in the short-term when they stay in the same stage of the process, which can be the heuristic or the algorithm but, on the other end, companies oriented towards reliability, in the end, are more likely not to grow and they are not powerful enough to overcome the new competitors in the market. Leavy explains that to be successfully innovative companies must apply reliability and validity simultaneously and that managers have to employ a new perspective on three essential aspects and structure is one of these. ‘As a rough rule of thumb, when the challenge is to seize an emerging opportunity, the solution is to

perform like a design team: work iteratively, build a prototype, elicit feedback, refine it, rinse, repeat'. (Leavy, 2011) In fact, for example, operating a supply chain, or creating models to predict and determine possible outcomes, or cover financial and organizational functions can be carried out by employees that have stable roles and functions, and this is the best fitting framework for reliability. Companies should embrace a new structure even if in the beginning it might sound like a contradiction. Successful corporates like Google have embraced this structure, which can sound odd in the first place because it used not to be common that a company has normal departments like finance and accounting and other departments that create and collaborate 'like a design shop.' (Leavy, 2011) However, it is what the unusual that changes the state of the affairs and brings change, and this is a clear example.

2.5 Defeating cultural and educational boundaries through design

Leavy wrote in his paper *Design Thinking – A new mental model of value innovation* that in order to be successfully innovative companies must apply reliability and validity simultaneously and that managers have to employ a new perspective on three essential aspects and structure is one of these, while the other aspects are process and culture. Within a big number of companies, internal processes are usually leaning to operating an already existent algorithm or heuristic and, in order to develop a better equilibrium, it is important that these processes are changed in a relevant way. It is very important to recognize old patterns and modes of operating that are related to cultural norms and patterns but that can be changed for achieving better results that are accomplished through design thinking. This approach shows how reliability and validity oriented cultures have different ways of looking at constraints. When companies are more aligned with reliability, then they tend to consider constraints as antagonists and the managers of these companies tend to be more likely to apply analytical thinking, not putting efforts in activities like design. Differently, on the other end, companies more aligned with validity tend to consider constraints as favorable circumstances.

There are different strategies that an executive can employ in order to make the company be like a design organization. He can be a design executive himself or he can delegate design activities to other departments involved in design so that he can focus on the creation of processes that are beneficial to design. For example, the chief executive officer of Procter & Gamble believed that there are two alternatives in order to create “design friendly organizational processes”. These two alternatives are either importing design thinking from external design competence sources, such as agencies or freelancers, or the second alternative is to shape this kind of design organization from the inside.

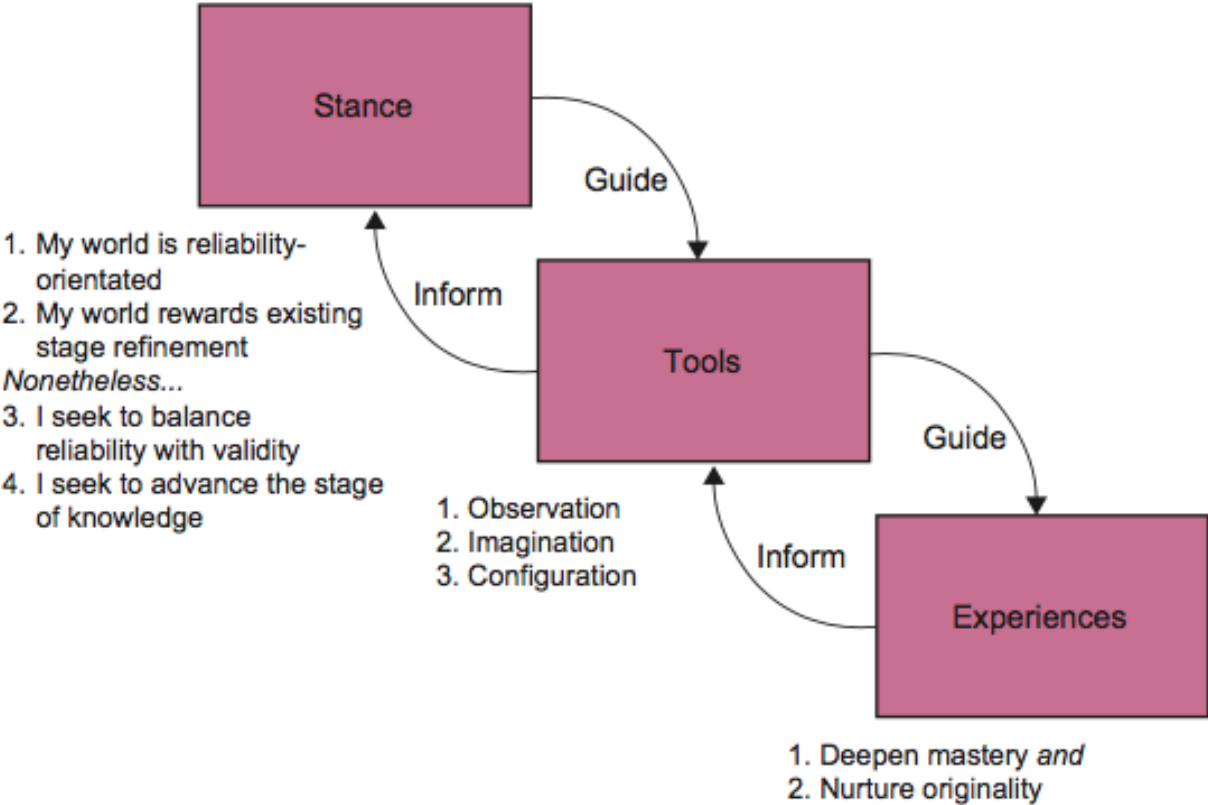


Figure 11 – Stages of knowledge for design thinkers (Martin, 2009)

Roger Martin, as a conclusion of his paper about how to design a business, gives a few recommendations on how to develop and improve the design activities within companies, also on a personal level for design thinkers running the design activities within the company. He provides tools and advices on the development of personal knowledge that design thinkers should develop and implement. The scheme of knowledge that Martin shows includes “stance”, “tools”, and “experiences”, as it is shown in the figure above. The figure shows the process that design thinkers should employ when creating and designing new solutions. The three different stages are stance, tools, and experiences. Within the process they must be able to move from a stage to the other, back and forth. Experiences have the power to feed originality and to expand expertise. Tools are a means for observation, imagination, and configuration of new solutions. Stance is the position that design thinkers take in the process of innovation, which can be towards reliability or the clearing of current processes. (Martin, 2009)

2.6 Designing for growth – A case study

Jeanne Liedtka, professor at the University of Virginia, published in 2011 a book in collaboration with Tim Ogilvie, which is called *Designing for Growth: A Design Toolkit for Managers*. A chapter from this book is about a case study that she carried out and which explains how to learn to use the process of design thinking and its tools to carry out successful and sustainable innovation. Design thinking is an important source for competitive advantage in the long-term and it has been defined as a process of continuously redesigning a business using insight derived from customer intimacy. It's an approach that addresses product, process, and business model innovation.' (Liedtka, 2011) Ogilvie and Liedtka provide tools for managers that are willing to embrace the process of design thinking to create radical innovation within their companies.

In the paper that Liedtka wrote in the same year, 2011, *Learning to use design thinking tools for successful innovation*, she states that every manager that employs the right tools is able to accomplish innovation. In order to illustrate this concept, she explains and

analyze two different scenarios with two different managers as subjects who both are trying to innovate their business and they are dedicated to that but only one of them achieves growth and change.

Liedtka tells the story of two managers and their different approaches to innovation and to managing a business according to different perspectives on innovation and how it should be accomplished. She describes two scenarios that bring to different outcomes and it is interesting to see how different mindsets impact a business and its growth and innovation. She brings the example of two real managers. The first one is Jeff whose experience was used for conducting a study on growth and innovation leadership by Jeanne Liedtka, Bob Rosen, and Robert Wiltbank. In the case study that I will describe below, Jeff is a manager who had just started working at Pfizer, a healthcare company. Instead, the second manager, George, is not a real person but he is a character created from the combination of different people that Liedtka has had the opportunity to cooperate with in her previous researches.

2.6.1 Case study – An example of successful innovation

The manager in the first scenario, Jeff, has a lot of experience in managing teams with different functions and performances. He has experience in innovation management from previous companies and now he starts working at Pfizer Consumer Products and his function there is to innovate and enhance and expand the business of users' goods and commodities. His background is in design and he believes that there is no innovation without a broad comprehension of users and their habits, behaviors, preferences, and perceptions. He believes that this understanding is fundamental because it is, indeed, the only way to find solutions and design them to improve lives of people. Above all, he believes that innovation has to be grasped and understood as a field of study or subject because it is a strong means to achieve growth and innovation on a sustainable base within businesses. (Liedtka, 2011)

Jeff believes that the accessible information and data are not enough as to their quality and he wants to gather new qualitative data through research in the field. His idea is to gather useful and meaningful data is to create a team with people who have different backgrounds and capabilities and bring them in the field to get in direct touch with the users by spending time with them, working together, and by simply being part of their lives. This method of researching enables the team to gather a lot of observations and to develop insights about patterns and about what might be meaningful to design. The central idea around the research being carried out was to identify what could be designed in order to make users experiences and their lives better and improved in meaningful directions.

After carrying out research in the field, the team understood that all the healthcare products in use were thought and created as products to be used at home and not on the go. Their understanding was that people need to carry healthcare products outside of their home and use them in their everyday life, at work, travelling, commuting, and whenever they are not home. This was the starting point to design solutions to ultimately enhance consumers lives. The team started to design portable products that could be used outside so that people in need of healthcare products could simply use them in every circumstance with peace of mind.

They had a starting point to start creating new solutions and this brought them to create new potential solutions to test them and see if they were successful and understood within the market. One successful product was one connected with one of the best brands of the company for mouth-cleansing products. Their idea was to make mouthwash available on the go and, therefore, they tried to adapt the mouthwash in liquid form in the form of something usable on the go. Their outcome was a set of narrow strips that could be easily carried around and, subsequently, they wanted to test this possible solution and see if they could gain positive feedbacks from the potential users of this product.

The next step was therefore the enhancement of the possible outcome in order to try out the different types of shapes and configurations. In the end, they came up with a solution. They created a product that could carry different items with different functions at the same time. They wanted to design a tool to bring together different products, as if they were a kit, in a unique and single item. 'Soccer Moms could stock kits in their cars with

band-aids and Neosporin ointment; professionals could create kits with Motrin and Zantac for their briefcases.' (Liedtka, 2011)

The solution was identified by the team and, at that point, they had to bring it forward. The next step was to identify partners in order to develop the product. Jeff, the manager, was concerned about the supply chain and he was aware that it would not be easy to make the product be made and commercialized on a large scale. Furthermore, he was aware that it would not be easy to find retailers who would believe in the value proposition of the team right away but only after deep considerations. These are the reasons why he was looking for favorable opportunities that could bring the product to the market rather quickly. He believed that the velocity to bring the product in the market was very important and it is often neglected by managers. The solution that Jeff picked was to find some small partners, such as some retailers, and start to sell the product and gain feedbacks in order to understand the performance of the product and how it could be improved.

The idea of Jeff was, therefore, to make a test and see the performance of the product in the market. The product started to be sold by seven retailers. Key for this process was to gather feedbacks and check on the experience that users had using the product in order to then learn from this and re-design it. The team was curious about the impact of the new smaller size of the product on the larger ones that were already in the market at that time, and they tried to gain feedbacks around this issue. The result was that the product had success and the team started to create new products according to the same idea of portable healthcare products in order to expand the supply in the market and bring the products to more and more retailers and markets. Realizing that the product had such good outcomes in the market was key for the management of the company. Therefore, they could invest in product growth and, shortly later, the Pfizer gained higher revenues from these products and the new range of products was expected to be a 500 million division within the company. This allowed the company to be one of the best rated consumer product corporate at the time when this division of Pfizer was bought by Johnson and Johnson in 2006. (Liedtka, 2011)

2.6.2 Case study – An unsuccessful attempt to innovate

The second character that I am going to describe here is called George, as Jeanne Liedtka describe in her paper *Learning to Use Design Thinking Tools for Successful Innovation*, and he is the combination of different managers that Liedtka has worked with in her past as a researcher. Therefore, differently from Jeff, he is not a real person. Liedtka compares the two managers in order to show two different perspectives on innovation. She explains that most of the innovative ideas and potential enterprises fail when they are developed and brought in the market and only a small percentage of them is successful, and this is why she describes this second character and his way of managing that is different from the one of the successful manager Jeff. (Liedtka, 2011)

The second manager, George, is working at a manufacturing company. He has to meet certain targets of growth and he is worried about accomplishing them. He has a background in engineering and he has a master in business administration. At work, he is the one who is asked from colleagues for technical issues and he has already worked in different teams within the company and he was responsible for their growth together with the demands and needs of the market. George was asked to manage a new team within the company which was big and required adjustments in order to fit to the always changing environment. He was concerned with bringing growth to this new division because it was a new one, which had just been acquired by a company active worldwide that was expecting innovation targets which were a big challenge according to George, since the division had just been acquired. He took on the challenge and asked the team to gather the data available within the company in order to identify what were the users desires and inclinations. Once these data had been analyzed, the manager believed that he knew enough in order to move on with the growth targets he had to meet.

Subsequently, after the data processing, he decided to talk directly with the existing customers and he picked the ones who were satisfied about the products of the firm and who had been loyal to the products for a long time. He was convinced that innovation would have, at that point, easily achievable. The team was looking for a disruptive idea but without a specific strategy to find it and, after data analysis and research, they were missing some radical means to innovate. They tried to work on the financial sources of the company and see if they could help in the innovation efforts.

In the end, the team and its manager decided to use an existing technology to reach new customers by applying it to different divisions of the company. They did not know how the responses from new customers would have been because there was no testing phase after the idea was picked. It took months before the finance department allowed the team to keep going with their projects because it was a big investment and they had to make sure that the return on investment was worth it. The strategy was then to keep this idea inside the company because the risk was to spread information that could, in his opinion, be a threat for the company.

Once the product reached the market the first news was not so positive and the new users target did not understand all the advantages of the new technology. Resellers did not show enough interests and sales were not going so well. After different attempts, the new technology was still not successful and the innovation efforts ended up in a complete failure. (Liedtka, 2011)

2.6.3 Case study conclusions

The outcome of this case study and the innovation efforts of the two managers suggest that different approaches lead to different outcomes. The innovative efforts of Jeff suggest that learning is crucial in order to deliver meaningful solutions because it allowed him to explore new ideas and create a new value proposition that was radically new in the market, facing unpredictability to design new solutions. On the other end, George was afraid to challenge himself and his team to create something radically new because it is riskier and the problem at the roots of his failure was that his mindset was closed to new opportunities. As Liedtka states in her paper 'for George, his mindset has helped him achieve success in a stable environment, but when the job requires the exploration of uncertainty, it increases the likelihood of failure.' (Liedtka, 2011)

What made the solution found by Jeff so relevant was that he found a way to enhance life of people and he did not just come up with a new item to sell. While, on the other end, George did not get to know deeply what customers would have bought to improve their

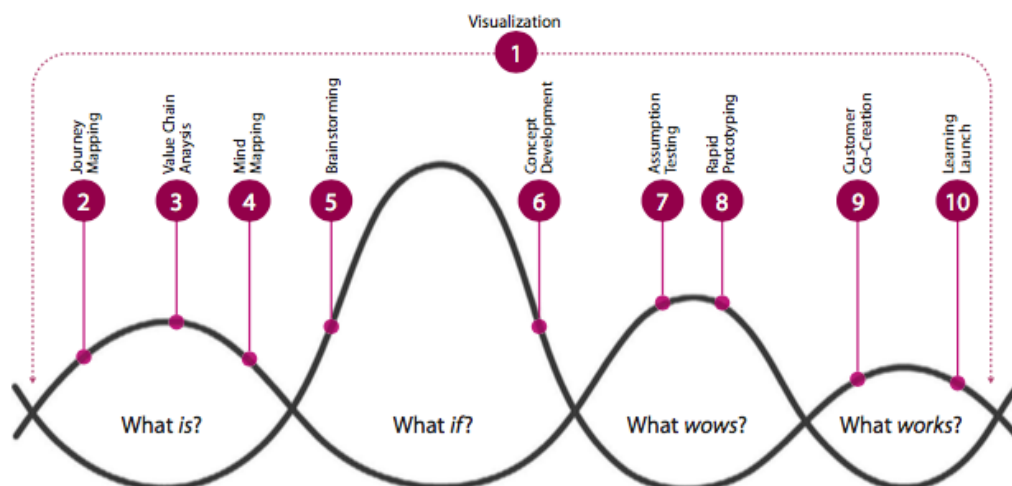
lives but he merely created a product that was not perceived as worthy of being bought. And this is the reason why it failed in the market. The key point of design thinking is that it reveals needs that users are not aware of and when they get to see the new product they get to enhance their quality of life. This is very important to point out because it changes the perspective on how business is important for people lives, in every aspect of it because when companies design radically new solutions and they satisfy new needs in healthcare, education, environmental and social issues, then they transform life of people in a really meaningful way that brings value. Liedtka writes that 'unarticulated needs – not requests from purchasing– are the most secure source of new ideas that have true competitive advantage (and hence higher margins).' (Liedtka, 2011) Design thinking discovers needs that even users are not aware of and it brings solutions to these freshly identified needs. This suggests that it is very important to get to know users on a deep level, even though this process is harder and it maybe takes more time and risk but it is what brings radical and meaningful innovation and, financially, a bigger margin.

The failure in the second scenario is related to the inclination of the manager towards a low risk solution which was not delivering meaningful change. George did not conduct market research and did not talk to potential users of the new category of products but, instead, he relied on existing data and targets. On the other end, the successful manager Jeff was making experiments to understand how the product was understood and appreciated in the market and this gave him feedbacks to keep working on the product, and the result was, in the end, well understood in the market.

Liedtka describes in her paper the story of the two managers Jeff and George and she concludes by offering the readers a graph that shows the process of design and the different phases that innovators should go through in order to develop meaningful innovative solutions. The process of design thinking can be described by four different stages and many other subsets. The picture below helps the reader to understand the different parts of the process thanks to a visual perspective. Liedtka aims at giving the tools for designing and they are the ten in the upper part of the picture: visualization, journey mapping, value chain analysis, mind mapping, brainstorming, concept development, assumption testing, rapid prototyping, customer co-creation, learning launch. Furthermore, it is important to keep in mind that the process should be iterative and, therefore, it is made of going back and forth between different stages until the team

of innovators will be satisfied with the solution carried out. Ethnography is a very useful tool to explore behaviours of users, which is, according to Liedtka, the “journey mapping” phase. It is useful to create relationships with potential customers because they can help innovators to co-create, adding value to the product. It is crucial to create value in order gain actual competitive advantage.

The efforts of a company to create innovation are basically related to the desire to bring novelty and meaning in the market as a result of a design process. Once researchers identify a need of users that they do not even are aware of, there comes innovation. And the power of innovation is that it allows companies to grow and keep their market share. Growth, furthermore, allows companies to higher their revenues and profit margin and this ends up in more potential investments that companies can undertake over time, which, in turn, leads to more growth and innovation. And this cycle should be going continually because innovation is key for keeping market share and a place of leadership. This is why companies should invest more and more in R&D and in innovative projects and they should adopt user-centred and co-creation frameworks such as design thinking, which is a very powerful tool for business growth.



Notes: The design thinking process can be illustrated by combining four basic questions, which correspond to the four stages of the process, with the 10 essential tools.

Figure 12 – Tool kit for meaningful innovation (Liedtka, 2011)

Chapter 3

Design thinking for competitive advantage

Design Thinking has changed and evolved in the last decades because of its successful outcomes and because it has proved that the framework of design leads to growth and to the achievement of competitive advantage through innovation. Design has been studied and valued within the realm of business innovation especially by Tim Brown in his paper *Change by Design* and by Roger Martin in his book *The Design of Business: Why Design Thinking is the Next Competitive Advantage*. Brown and Martin have two different perspectives on the topic but they recognize the importance and the power of design thinking, and they believe that it should be part of every company's business strategy.

As I described in the second chapter, in the section "Development of innovation through existing knowledge", the role of the innovator is to drive the business through the funnel of knowledge which is composed by mystery, heuristic, and algorithm. According to Roger Martin, the real key for innovation, and, therefore, competitive advantage, is the velocity employed by companies to move from stage to stage, in comparison with the pace of competitors. The funnel allows companies to optimize expenses, to redeem resources and investments, and to be at the top of the competitive landscape. Martin argues that capital markets play a role in the pace through which companies go through the knowledge funnel. The reason is that businesses attribute the profits to the shareholders and this prevents companies to move faster than competitors through the funnel. It makes sense that shareholders obtain part of the profits but, on the other end, by putting shareholders as first recipients, the long-term perspective of growth is negatively impacted from this hierarchy because, in doing so, the knowledge does not advance more quickly than competitors. (Martin, 2009)

3.1 An overview on competitive advantage

It is important to comprehend the concept of competitive advantage in order to understand how to accomplish it in the market. Alexandra Twin, business editor specialized in finance, defines competitive advantages as 'conditions that allow a company or country to produce a good or service of equal value at a lower price or in a more desirable fashion. These conditions allow the productive entity to generate more sales or superior margins compared to its market rivals.' (Twin, 2019) Competitive advantage can be achieved through the benefits that the company delivers to the users, through the segment of the market that the company achieves to understand and satisfy, and through the role of the company within its competition.

Michael Porter, professor at the University of Harvard, published a book in 1985 about the concept of competitive advantage. His aim was to make companies aware that when they are leader in the market it does not mean that it will be sustainable and he further analyzes the role of innovation for competitive advantage. It is crucial to understand this concept in order to understand how design thinking comes to help for its development and sustainability. Porter outlines what he believes are the three most important elements for gaining competitive advantage. They are, indeed, cost leadership, differentiation, and focus, either on cost or differentiation, as it can be seen in the picture below.

Porter explains the sources of competitive advantage that are leadership of cost and differentiation from competitors and how they depend on the market scope which can be either broad or narrow depending on the target of the company. Every different quadrant corresponds to a different strategy to employ in order to gain competitive advantage as it is suggested by the figure below. The four strategies can be low cost, differentiation, focus market together with a cost strategy, and focus market together with a differentiation strategy.

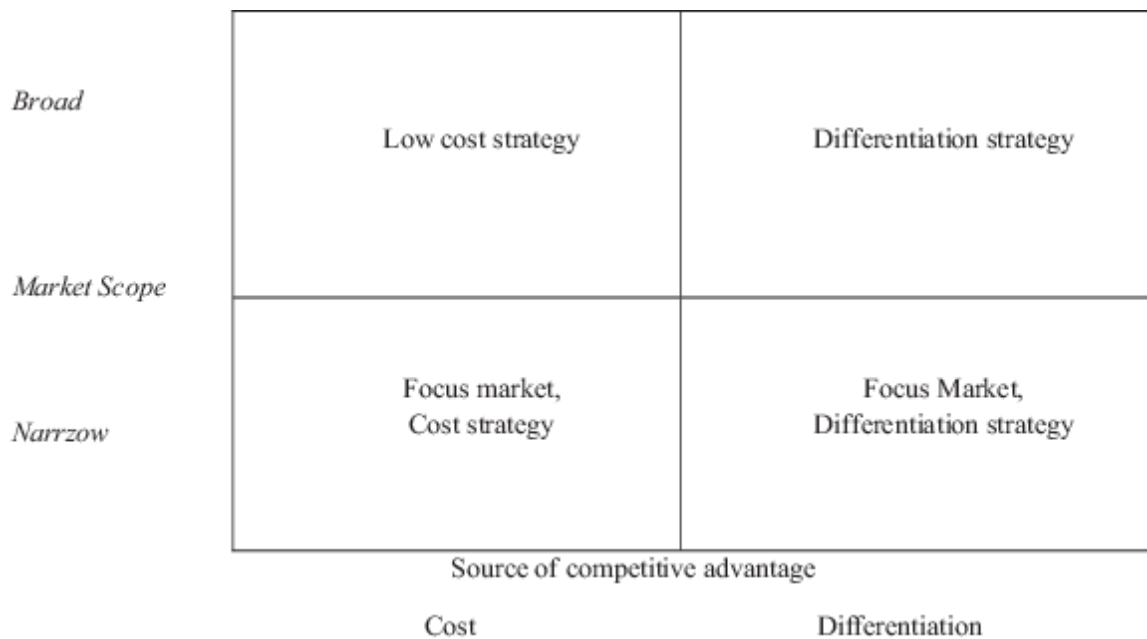


Figure 13 - Porter's competitive strategies

Porter explains the sources of competitive advantage that are leadership of cost and differentiation from competitors and how they depend on the market scope which can be either broad or narrow depending on the target of the company. Every different quadrant corresponds to a different strategy to employ in order to gain competitive advantage as it is suggested by the figure above. The four strategies can be low cost, differentiation, focus market together with a cost strategy, and focus market together with a differentiation strategy. Once companies successful employ one of this strategy then the outcome is competitive advantage, which allows them to be leader in the market, with the respective advantages coming from this place of leadership.

Every strategy in the picture can be employed to reach the different types of competitive advantages – leadership of cost, differentiation, and focus. And, furthermore, in order to adopt one of those strategies, companies must find a product, process, or business model

that allow them to make a step forward, to make something better than competitors, to find a process that allows the company to lower costs and therefore reach a cost leadership, but these are just a few examples.

Design thinking is a tool that companies can adopt in order to successfully apply one of the four strategies. It is a powerful tool that comes into play to exploit the potential that the company has. Design thinking helps innovation teams to find creative solutions throughout field research, ideation, prototyping and testing directly together with the potential users of the product, service, or process. Furthermore, this allows to gain a deep understanding of the cultural and social environment surrounding the users. This framework provides companies with new and more open perspectives on the existing market environment. For example, design thinking might help companies to find a way to lower the production cost without giving up the features and the nature of the product, and the result of this is a cost leadership that is, potentially, competitive advantage.

Design thinking is definitely not a smooth and fast process to create innovation, because of its nature and its intent to design solutions for rather complicated issues, but it is worth it to invest in time and resources to carry out the process and come out with new solutions. The framework of design thinking offers a new perspective to consider problems, it is human-centered, it is characterized by adopting new perspectives on problems and aims to give solutions that satisfy needs that users were not were to have until then.

3.2 Ford and its collaboration with IDEO for competitive advantage

A good example of disruptive innovation thanks to the application of design thinking is the worldwide famous company Ford which a few years ago has redesigned its way of working and innovating in order to keep its leadership in the car industry. Ford has indeed developed and maintained a fruitful collaboration with the American design thinking company IDEO that has made Ford change its perspective by introducing it to the field of design and its applications in the car industry. The Ford Motor Company was

funded in 1903, more than a century ago, by Henry Ford. On the third of October 1903 Ford sold its first car, and, ever since then, the company has been one of the leaders in the car industry by creating always innovative cars and changing the concept of means of transportation. It was founded as a family company in the United States and it still is. Ford was one of the few companies within this industry to survive the financial crisis of the 1929 and since then it has always had a place of leadership in the market. Below I show three Ford models famous worldwide for their innovation in three different times. The first one is the “Model T” which was sold from 1908 until 1927 and fifteen million cars were sold during that time. The innovation of this car was its architecture which allowed to drive in every kind of terrain, since only few roads were paved at that time. This car was especially designed for reaching the upper-middle class and not only very rich people. It was not a luxury car but it was rather affordable and easy to use for its intended purpose of moving people. Furthermore, thanks to innovation of processes, the time needed to build a car went from twelve hours to one and a half and this allowed the company to produce more cars and, therefore, to be able to lower the price. The Model T was one of the most sold car at all time. (Corporate Ford, 2019)

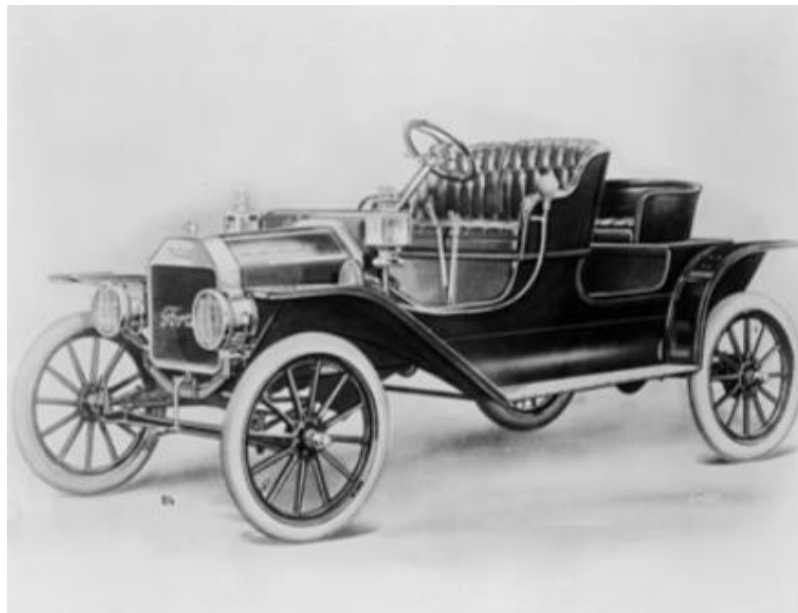


Figure 14 – Henry Ford’s Model T (Corporate Ford, 2019)

Nevertheless, to return back to the present time, it is interesting to see how Ford has changed its way to develop and implement innovation, thanks to its collaboration with the above mentioned and worldwide famous design company IDEO. Iain Roberts, partner and chief operating officer at IDEO, describes this fifteen years collaboration and its outcomes in the article *How Design is Driving Ford to Reimagine What a Car Company Can Be*. (Roberts, 2019)

Iain Roberts tells the story of when he recently visited the headquarters in the United States. He describes the inside environment of the company and how it looked like a sport court. 'Wide, open decks were marked by signs and little flags identifying team workspaces: Purchasing Boulevard, Operations Corridor, and Design Central. The walls of the space were adorned with customers stories, insights, and frameworks that had been collected during design research and now pointed toward new opportunities. At the centre of the room sat a new kind of prototype of a vehicle, which had been the focus of a startup-style development team made up of members of purchasing, HR, legal, design, accounting and more.' (Roberts, 2019) The prototype placed inside the room was typical of the design thinking process, rough and unrefined built up to visualize the developed concept and to test its potential.

This way of conceiving innovation through problem-solving and fast prototyping was adopted in all the headquarters of the company around the world. The company started to make the creation process faster thanks to the design thinking framework. This was achieved through considerable investments combined with the increase in the speed to bring the product to final users. Ford transitioned completely its management to a design type of arrangement in order to be more competitive in the market. IDEO has worked closely to Ford to help the company with certain particular ventures and projects.

Ford is a typical example of a company that has employed design as a way to innovate from a user-centred perspective. Roberts writes about the collaboration with Ford: 'Together, we've moved with Ford toward the precipice of becoming a new kind of company, suited to lead not just auto manufacturing, but a radical revolution in mobility.' (Roberts, 2019) This collaboration has made Ford adopt a new strategy, aimed to find always new ideas for radical innovation. They focused on the users and what they would have wanted as a car. And this enabled them to come up with new meaningful solutions that are able to fulfil users' unrevealed needs.

In 2017, Jim Hackett became chief executive officer and brought to Ford, thanks to his previous experience, a human-centred framework. He has created a system which made design a pillar of the organisation for every team within the company. In fact, the company has not two different strategies for fulfilling its purpose. One is the 'a global design lab network called D-Ford, with team around the world focusing not on products, but on customers. And second, a robust, enterprise-wide learning program to give everyone at Ford access to the design tools and skill sets that the collaborative team of Ford and IDEO spent years refining together.' (Roberts, 2019) Thanks to these strategies, design has been spread throughout the whole company.

Therefore, what is the outcome of Ford innovative design strategy? Did the strategy bring to innovative outcomes and competitive advantage? Roberts writes that one example of this design and human-centred approach is the SUV Mustang Mach-E, a completely electric car, high-tech and environmentally friendly, which was just presented to the public in November 2019. The team that implemented this project was composed by employees from different departments and they put their efforts together to design, commerce, and market the product through user-centred creative strategies that adapted to the always changing needs of users. Ford runs the initiative of leading workers throughout the different steps of the design strategy. Ford, for example, has groups of researchers working on child safety in Nanjing, studying night routines of taxi drivers in Dearborn, in the United States, to always put users in the first line. (Roberts, 2019)

The new vehicle introduced by Ford is designed for ease of use and for efficiency. For example, the battery stays below the floor filling the space that would not being efficiently used. The SUV has two motors, which are placed where the wheel shafts are and this means that the engine is not in the bonnet. This configuration allows engineers to gain a lot of space for comfortable driving and storage. Furthermore, the controls are user-friendly as well allowing the driver to have access to a bigger and better organised screen. Designers created plenty of prototypes and they ended up with a long and spacious bonnet and similar technical and non-technical features. The pictures below show the design of the internal and external look and functions of the vehicle. They created a lot of prototypes and, in less than a year, they went from sketching to setting up the production of the first model. (Phelan, 2019)



*Figure 15 – SUV Mustang Mach-E, the latest vehicle commercialised by Ford
(Phelan, 2019)*

3.3 How to design for sustainable competitive advantage

In an interview conducted by Brian Leavy in 2011 with Roger Martin, professor of strategic management and researcher in productivity and competition. Leavy published in 2011 a paper called *Interview Roger Martin explores three big ideas: customer capitalism, integrative thinking and design thinking* to understand the perspective of Martin on these topics. It is interesting to see how he considers design thinking as a way to go faster through the knowledge funnel, composed by mystery, heuristic, and

algorithm. And, according to Martin, going through the knowledge funnel faster than competitors ensures competitive advantage. This is key to gain competitive advantage, and the faster it is, the more sustainable the competitive advantage will be. (Leavy, 2011) Many companies have reached competitive advantage through design, such as Apple, which has benefited of design to create highly desirable products since the beginning of its activities. What Martin points out is interesting and offers a new angle on what it means to be competitive nowadays because of the always changing market conditions. In fact, he states that 'competitive cycles are shortening in many industries' (Leavy, 2011) because of the highly competitive market environment. Shorter cycles mean that it is harder to keep up with a market that changes with such a fast pace because it would mean that companies have to innovate all the time and, at the same time, they have to market the innovations they carried out and this can be very hard on a management level.

Furthermore, as Martin states regarding this race for leadership, 'competitors, both new and existing, will be creating new ways to leapfrog rivals.' (Leavy, 2011) Furthermore, Martin adds that, on a wider level, the condition to be competitive takes place by developing and conceiving new ways to gain a position of leadership that are not already there in the market yet. New ways to be competitive can include, for example, 'a better way of meeting the customers' desires, a new channel, or a different economic model.' (Leavy, 2011) These new innovative ways can be developed and accomplished through the creative framework of design thinking. Design thinking is a very powerful framework that enables innovators to jump in the future and create solutions not yet existing, without looking at the past and relying on incremental innovation. Therefore, design thinking has the power to radically create new solutions that make the company gain competitive advantage, which is more sustainable because something radically new has been created and this takes more time for competitors to imitate or, in turn, to come up with even more radically new solutions. Martin explains also that most of the companies have not yet started to go outside the limits of accurate inquiry, investigation, and refinement typical of the past, while, nowadays, companies must be conceiving a future that is deeply different from the present and past times. (Leavy, 2011)

Another important topic that came up during the interview between Leavy and Martin is that a big obstacle to innovation and creative thinking is the relationship existing between validity and reliability and how they are developed by managers. Settled companies tend

to be more in the direction of reliability, while start-ups and new companies tend to be more in the direction of validity. In all companies, there is a trade-off between the two concepts. By definition of Martin, reliability corresponds to the 'production of a consistent, replicable business outcome' (Leavy, 2011), while, on the other end, validity corresponds to the 'production of an outcome that you really want.' (Leavy, 2011)

It is important, indeed, to take into consideration both validity and reliability when it comes to managing the activities and the perspective employed within a company. Managers will gain more reliability if they do not put so much emphasis on considering exclusively factors that can be impartially quantified. On the other end, in order to gain further validity, managers could take into consideration a wider number of variables, which can be either quantified or not and that need to be determined and evaluated. The problem is that when companies become bigger and bigger in size there is a tendency to favour reliability because it is easier to manage and the outcome of this is that the company turns to be "process-oriented". A process oriented company tends to base its activities on processes, as a way to keep functioning in the market. Nevertheless, this perspective prevents the company itself from moving forward to a new place of leadership.

Martin believes that there are three steps that managers should follow to apply design thinking for meaningful development and advancement of the business. The three steps that I have described in chapter two are mystery, heuristic, and algorithm, and they have the function of driving managers and their efforts for designing radically new solutions. Martin explains this theory on a wider perspective that enables us to better understand what these three stages exactly are. He states that everything was until a certain point in history a mystery to the human kind. A mystery is something enigmatic that cannot be understood with the present tools and knowledge. But, thanks to knowledge, research, and learning, it happens that researchers overcome the mystery and develop a way to figure the mystery out and to adopt a perspective on it, hopefully coming up with answers. Martin tells the example of gravity – 'Newton discovered the heuristic of gravity; a universal force that causes everything to be pulled toward the earth.' (Leavy, 2011)

Once scientists or researchers identify the heuristic the next step is to land into the algorithm in order to make the process repeatable through formulas and models. This requires further studies and require to deeply understand the phenomenon and its effects

on a big scale. Martin brings here the example of the outcome of Newton's research process on the earth's force of attraction, which we know as gravity. Newton ended his research and studies on gravity with a formula that can be used to compute time, acceleration and distance and it can be used for a lot of different applications and the result is always precise and correct. The formula below is the algorithm carried out by Newton, a law that explains something that earlier was a mystery. (Leavy, 2011)

$$\text{gravitational force} = \frac{(\text{gravitational constant})(\text{mass of object 1})(\text{mass of object 2})}{(\text{distance between objects})^2}$$

Figure 16 – Gravity algorithm (Toppr, 2019)

This whole discourse about mystery, heuristic, and algorithm is important to understand because of its relevance within the business field. In fact, executives must be aware that knowledge takes place in every step. When executives are willing to go beyond the existing knowledge and solutions and they decide to explore new mysteries, they might end up with a heuristic and, in the end, with an algorithm. Martin brings up an example that is helpful to understand how this process can be used for business applications. He argues that if innovators, for example, find out what a certain segment of their customers think about a product and they understand what exactly leads customers to actually buying the product, they can derive the heuristic and, finally, achieve competitive advantage. 'This occurs when a firm focuses its operations on addressing the key things its customer care about. Every competitor still operating at the mystery stage has to cope with inefficient thinking, which likely will result in wrong resource investment decisions.' (Leavy, 2011)

It is important for managers to find ways to move away from mystery because this stage might lead to inefficiencies and waste of investments and time. If managers are able to

move to develop the heuristic, the next stage is to clarify the comprehension of users' behaviours and generate an algorithm. Through this algorithm companies can create profitable solutions that have the potential to be more and more successful over time. Martin explains that the reason behind is that most of the resources must be invested for investigating and studying mysteries. Furthermore, heuristics can be more convenient because, if they are handled by skilled employees, they do not need much time and resources to be grasped and understood. Finally, algorithms are very effective and they are very helpful in order to optimize resources and investments because they can be handled also by unskilled workers since they can be implemented through machineries and repeatable methods and processes.

A successful business moves from mystery to heuristic and, finally, to algorithms. The faster this process is, the more the company distances itself from competitors in the market and its investments on the process end up being successful. It is essential that the profits earned through this process are then invested to figure out new mysteries, always before competitors in order to maximise potential profits and keep implementing this process. (Leavy, 2011)

3.4 If everyone is doing design thinking, is competitive advantage still achievable?

Design thinking has been proved to be a useful to in order to gain competitive advantage if the framework is employed and implemented in the right way. The outcome of a successful design process is radical and meaningful innovation and this is, indeed, one of the factors leading to competitive advantage. There are many other factors involved, such as the speed by which companies innovate compared to their competitors, and so on. Tim Brown, chair of IDEO has published a paper in 2015 with the title *When Everyone Is Doing Design Thinking, Is It Still a Competitive Advantage?* In this paper, Brown does not come

up with a precise answer, but he rather offers a point of view on the relationship between design thinking and competitive advantage and their possible futures.

Nowadays, design thinking is widely spread within the business field. Successful innovative companies employ design as a core activity making it the cornerstone around which they organise and develop all the other aspects. They always start from design. Nevertheless, design is more and more employed also outside the corporate field, especially in sectors like health care, public policies, education, climate change, social issues, to give some examples. They 'have begun to prototype, iterate, and build more nimbly with a human-centred focus.' (Brown, 2015) Throughout the last decades design thinking has spread so much that nowadays innovators are doubting if it is still such a powerful framework to design innovation. 'It's a methodology always in pursuit of unforeseen innovation, so reinventing itself might seem like the smart way forward.' (Brown, 2015)

Nevertheless, design is a framework that can be used in many different ways because design gives the tools but then they are put into practice by people, and people can have many different ways to think and operate. Brown writes that design is 'a set of tool that can grow old with us.' (Brown, 2015) He firmly believes that competitive advantage can be achieved and maintained when innovators are 'not just practitioners, but masters of the art.' (Brown, 2015)

Furthermore, Brown writes that design thinking is a tool available at the present time everywhere and for everyone, but it is not equally spread. Only some big companies are using design thinking in an integrated way, applying the framework on a global perspective within the company. 'The Innova School System, for example, with 23 schools thus far, is applying design thinking across its platform, from how the classrooms are built to the curriculum.' (Brown, 2015) Or, another example, is the Design Policy Unit in the United Kingdom, which has adopted a design approach for a wide range of government actions and policies. The result of this is that the 'whole system feel more open, transparent, and easy to participate in.' (Brown, 2015)

Brown states that such good applications and case studies about how companies have successfully understood and applied design thinking completely, on a large scale, consistently, implementing it over time, are just a few and this is exactly the distribution problem that he points out. There are not many companies that fully understand and

apply the framework of design thinking to conduct their business and this is the absence of creativity that could be filled by companies to increase their market share and competitive advantage. Investing on this in the long term and consistently over time is key to keep the leadership and this is what companies should be more aware of.

Often companies invest inconsistently on innovation because it is not considered as a crucial activity to invest on, and the outcome of this choice is short-term profit, in case the innovation carried out is successful. The short-term profit could come for users' satisfaction and therefore revenues would grow but the problem is that, when innovative solutions are not radical, they are then quickly imitated and all the investments might not be worth it. The problem here is that, once imitators see the opportunity to make the same product as an innovative company and they manage to do it, then they are not spending money on research and development, but they only have to develop the product. They start from the solutions and then they recreate it and, in the end, this process takes much less time and resources and it provides the company with the potential for a bigger market share and profit. In the end, the innovative company in the first place will reach competitive advantage in the short-term and later on, once the imitators enter the market, none of them has valuable competitive advantage anymore. (Brown, 2015)

Another example that Brown brings up is the bank holding Umpqua. The company redeemed the Sterling Financial in 2014 and it became right away the biggest bank organisation in the West of the United States. Ever since, the chief executive officer decided to orientate the company towards a design thinking approach, investing resources and efforts on this decision. Right at the new start of their activity as a bigger company, they arranged an exhibition around the topic of design thinking and its user-centred and co-creative perspective in order to show this tool to all the people involved in the activity of the company. 'Company evangelists handed out Moleskins with tips on "how to be better-makers," and an internal tool (built on IDEO's OI Engine) helps teams master design thinking through open-platform challenges.' (Brown, 2015) Brown states that the challenge for being successful innovators on a sustainable basis is to become master of design thinking and the tools that it can offer. Therefore, key is to engage in the development of deep and broad competences, experiences, and expertise, because design thinking is something to learn, it is not some innate and instinctive capability. (Brown, 2015)

3.5 Design thinking and competitive advantage in a fast-paced market environment

Sustainable competitive advantage is a position of leadership that every company in the market is willing to gain and keep for an as long as possible period of time. Competitive advantage means, among other elements, leadership, high profits, power of negotiation, possibility to keep investments high to nurture continuous innovation. What is challenging nowadays in the market is that it keeps changing at a very fast pace because of the easily accessible resources and always improved technologies. Therefore, competitive advantage is more and more difficult to achieve and, subsequently, to maintain.

An interesting article written by Mayank Dhaundiyal entitled *Design Thinking for a Competitive Advantage* is useful in order to understand how competitive advantage works and how it is linked with design thinking. Dhaundiyal brings up a few examples of how design has been successful for some companies. The first example he brings up is about the company OYO, which is the biggest hotel company in India, with over six thousand buildings around over one hundred cities within the country, and the company started out only three years ago and it has already reached such a big size. The second example Dhaundiyal brings up is Ola, which is by now the largest company operating in the taxi industry, and also this company was established just six years ago. Dhaundiyal explains that the two companies challenged 'the well accepted logic of their respected industry, that is, the need for owning the assets for running their businesses and not only rapidly gained market share from the competition but created new market.' (Dhaundiyal, 2017) This means that competitive advantage is still achievable, even though the market nowadays changes at a very fast pace, but if companies question the existing structures and paradigms, and they create something new and desirable, then they have access to leadership and competitive advantage.

Dhaundiyal in his article about competitive advantage states that companies should start thinking about how to keep staying free from competitors rather than trying to be leaders surrounded by competitors that represent indeed a real threat. Therefore, companies need to face innovation with a different perspective, more focused on changing their

paradigm towards a design thinking framework that provides them with new ways to define problems, rather than finding solutions for badly defined problems and needs. The process of innovation must be always implemented for it to be always valuable and significant for the users through design thinking. Dhaundiyal argues that companies should employ a structured framework and exploit it for 'coming up with solutions that not only provide a significant value addition to its target customer group but also to its creator.' (Dhaundiyal, 2017)

As I wrote in the first chapter about design thinking and the whole process to implement it, it is a very valuable and useful framework in order to identify unrevealed needs and solve them according to real needs of customers to finally change their life with meaningful solutions or artefacts. The highly iterative, human-centred, and deeply questioning nature of the process is the guarantee that the result will be breaking the paradigm and be well accepted by people. There are no constraints when it comes to research new solutions and possible scenarios and this gives the potential for accomplishing breakthroughs because there are no limits or analytics to consider when it comes to developing new ideas and concepts with a creative and free mindset. Ideas out-of-the box are especially encouraged and supported because they tend to deviate and to go towards different directions and the result has more potential to be disruptive when this approach is employed. (Dhaundiyal, 2017)

Many factors make design thinking a very valuable process. For example, empathy with the potential users, co-creation, field research, ethnography, and so on. Since users are not aware of their needs, designers need to identify them to create radically new solutions, and, if they will be successful on this, the outcome of innovation will be competitive advantage. The problem within companies that struggle to stay in the market or that have very little revenues is that they tend to cling to the usual methodologies and tools used to conduct the activities of a business. They are 'laced with generous servings of spreadsheets and power point decks detailing competitor data and past industry trends.' (Dhaundiyal, 2017) Even though, it has been shown that it does not make sense to look at the past in order to act in the present, because the past does not give sharp insights about the future and the risk is that companies focus too much on their experience instead of being open to new potential opportunities. (Dhaundiyal, 2017)

Dhaundiyal believes that a way to start adopting design thinking within organisations of any kind can be achieved by incorporating this subject into the educational system. This would allow organisations to develop the skill of design thinking to face uncertainty and the new challenges of the market. The solution is therefore to make design as part of daily routines, and furthermore as part of companies' strategy and planning. As also Brown argued, not many companies and organisations in the market are giving enough importance to design thinking, and this might be a problem for their developments. (Dhaundiyal, 2017)

Dhaundiyal agrees with Brown on this point. In fact, he writes that 'only a handful of institutes, including Bennett University, are making efforts to expose students to this simple yet powerful methodology.' (Dhaundiyal, 2017) They run workshops, programs, laboratories, projects, in order to transmit the importance and the understanding of design thinking to students, so that they start being familiar with this subject. The aim of the school is to make the students able to apply design thinking to real scenarios, to create real solutions in terms of products, services, and processes, to deal with challenges that companies struggle with. (Dhaundiyal, 2017)

3.6 The future of competition and co-creation

Design thinking is a very powerful framework and process that companies and organisations can adopt and implement to gain competitive advantage, even though it is not the only one. It is important to put it in a context where other tools are present too, so that the view on innovation and the possibilities to implement is are wider. Francis J. Guillard, president of the experience co-creation partnership in Concord, United States, is the author of the book *The Power of Co-Creation* (2010) and of the Harvard reviewed paper *Community Powered Problem-Solving* (2013). Back in the early 2000s, a new perspective on business started to take place by considering co-creation as a relevant tool for companies to be successfully competitive in the market. This perspective is now valued and, for example, design thinking completely embodies the co-creation mindset in

its framework. Prahalad and Ramaswamy, who understood back then the importance of co-creation, wrote that the reason why it is so relevant is that co-creation allows to deliver a 'unique value by involving customers and other stakeholders in a process of continuous innovation and learning.' (Gouillart, 2013)

Gouillart states that what executives should do in nowadays market is to take one more step ahead to keep nurturing competitive advantage by applying a model of co-creation. And, rather than developing capabilities within the organisations to keep them exclusive, it is important to be open towards the external environment. Companies must face the market by unfolding their internal processes, such as research and development, marketing, to give some examples, in order to 'attract a dynamic ecosystem of customers and other stakeholders.' (Gouillart, 2013) According to Gouillart, it is important for companies to network in order to stand out of the competition and be successfully innovative. For him, the key of development and success lays in relationships with the outside environment.

There are expectations that the market will be more and more based on the quality and purpose of networks and relationships between different internal and external stakeholders. Gouillart expects from this perspective on networks that companies will start chasing co-creation by networking and developing relationships with the best possible stakeholders. This view that the author describes tells us that a competitively successful company is, in the first place, the one that creates value through its external networks, and also, at the same time, can deal consistently over time with the always changing market conditions and the current state of the affairs. According to Gouillart, the companies who are most successful in this challenging chase will be able to accomplish competitive advantage and market leadership thanks to their internal and external networks and ecosystems. In his paper, *The Race to Implement Co-Creation of Value with Stakeholders: Five Approaches to Competitive Advantage*, Gouillart shows what he has researched and observed in more than two hundred case studies about the relationship between networks and innovative economy. The central idea around which he has set and developed his research is about the different frameworks that organisations have the possibility to employ to face the market through a solid network for achieving endless change. (Gouillart, 2013)

3.6.1 Possible frameworks to implement co-creation

Gouillart explains that there are five different frameworks to achieve co-creation for competitive advantage. And every method to achieve competitive advantage can implement each of the five frameworks, together or independently, and to different extents. The five frameworks are community, platform, interactions, experience-based, economic value. Community relates to the importance of involving users in order to create a network of meaningful relationships both inside and outside the company. Platform relates to the need for a medium for the network to communicate and exchange feedbacks, ideas, insights, and so on. Subsequently, interactions, the third element for co-creation, must be wide, continuous, and financially efficient. Then, the fourth element is named by Gouillart experience, and it refers to the importance of the personal experience that the users and stakeholders within the network have in relationship with the company. The last element that Gouillart lists in his dissertation is economic value, which refers to the importance of the creation and development of value within the ecosystem of the company for all the stakeholders involved. (Gouillart, 2013)

The five elements just listed can be implemented to different extents and they have the function to create a meaningful and consistent network both internally and externally by involving all the different stakeholders to take part in the activities of the company. It used to be rare that companies would engage in this way of communicating and operating on a co-creative perspective. Nowadays, it has become a more and more accepted practice and most of the innovative processes embody cooperation with users. A focus only on research and development is outdated and it is not enough anymore if companies want to create meaningful experiences. Gouillart believes that if executives start making sense of other companies' experiences, they have the possibility to understand pros and cons and how they can use these experiences to design innovation within their companies. (Gouillart, 2013)

Furthermore, Gouillart describes five paradigms that enable companies to successfully network and interact in relationship with their environment. They are social marketing, design thinking, co-creative transformation, crowd-sourcing, and open innovation, even though these are just some of all the existing paradigms. Social marketing, especially when used in consumer goods, 'involves the opening up of the marketing, sales and service part

of the value chain.’ (Gouillart, 2013) The model relies on the power of the network of companies and this approach to do business was a substantial change in perspective. The new perspective allowed companies to invest less in personal sales and more in means that were entrusting ‘existing consumers to do the job at lesser cost and with greater credibility.’ (Gouillart, 2013) If opening up the value chain to the external networks was the first step to a new perspective on innovation, the second step will be to ‘open up the brand itself to co-creation.’ (Gouillart, 2013) This can be implemented more likely by companies that focus on the involvement and perceptions of users and that at the same time keep their position of influence. Also, companies must always invest their efforts in growing the network of stakeholders and keep the relationships that they manage to develop for constant growth.

The second archetype that Gouillart lists for co-creation is indeed design thinking because of its user-centric and design-driven perspective, which allows a broad comprehension of the environment and allows companies to create a meaningful network. The engagement and the connection generated by design-thinking is high, thanks to the process of design, iteration, and co-creation, highly based on users’ feedbacks and perceptions. What enables designers to create meaningful solutions is their empathy for the users but, on the other end, this can also be a limitation of this framework. The reason is that, if designers are not empathetic and creative enough, then the result of innovation is not as meaningful as it should be, and all the investments carried out by the company end up being worthless. Furthermore, it is not possible to foresee the outcome of the design thinking process beforehand, because this is indeed one of the key points of design thinking, that is a highly creative and iterative process, which aims to bring disruptive radical new meanings as solutions to users’ needs. This means that companies cannot establish accurate budgets, deadlines, and resources to invest, because of the nature of the process of design thinking, which can turn out to be a risky investment in a way.

The third archetype suggested by Gouillart is co-creative transformation. What Gouillart means by co-creative transformation refers to innovation in the organisational aspects and the operational processes within companies. Co-creation within companies entails that internal stakeholders, together with the external ones, jointly create solutions related to the organisation and processes of the business. Through this new perspective, all the stakeholders gain a more active role in the co-creation of the business. ‘Co-creative

transformation mixing bottom-up and outside-in dynamics' with users having an active role in the co-design of the organisation, ends up creating 'enthusiasm and momentum that motivates middle and upper management to invest the necessary resources for change. (Gouillart, 2013)

The fourth archetype for co-creation and innovation is crowd-sourcing. Crowd-sourcing is a model according to which people share resources, ideas, services, and so on, and they can obtain the goods and services they need from this network of people, online and offline – in fact, crowd-sourcing is often open-source. In this kind of model, users aim to do problem-solving by gathering and working together. Their purpose is usually to gather content and make it available on a large scale, so that, also, the bigger the network or platform becomes, the more people can give their contribution to improve the content available. An example of this framework is Wikipedia, which collects knowledge on a community base and makes the content available for a large community and without any cost. The drawback of this kind of model is that it works well with organisations that are working in the social realm because, most of the times, the service offered is non-for profit and, therefore, there is no business behind it. This means that this model suits more non-for-profit companies and, therefore its applicability is limited. However, this approach can be combined with another one not based on co-creation. This is for example the strategy adopted by Facebook, which combines both content creation through crowd-sourcing and usual business activities, such as marketing and advertisement.

Finally, the last archetype of co-creation that is described by Gouillart is open innovation, which is a strategy that companies can implement to obtain resources that do not come from inside the company in order to enhance products, and develop them more and more over time. The aim is to implement product development to be faster in the commercialisation of products that are innovative because of the internal activities of research and development. This kind of innovation is defined crowd-sourcing research and development because it is open to networks existing outside the company. The idea of open innovation is to define a problem and then give it to the network to solve it. The issue is that the problem should be precisely and well-defined in the first place so that it is easier for the community to solve it. On the other end, this is a limitation because, since the problem is very precisely defined, it is harder for the community to solve it because more specialised knowledge is needed. Another limitation of the open innovation

approach is that it is hard to manage relationships between the internal and external experts and it tends to rely on external ones because 'it allows them to generate additional income or gain recognition for themselves, but too often, engineers inside the firm are barely consulted on the use of open innovation approaches.' (Gouillart, 2013) One successful example is Procter and Gamble that managed to apply this framework for its activities, reducing costs and implementing its products, but this is one of unfortunately not many case studies on open innovation. In the future, open innovation will become more efficient if a new way to define problems will be implemented, and also if the communication and relationship between internal and external technical experts will be improved, and, in the end, if the network will be expanded more and more so that more people can give their contribution to the projects and product developments of companies.

3.6.2 Possible future directions

In the last paragraph, I have listed and explained different approaches to co-creation, which is a powerful tool to create meaningful innovation thanks to the relationship between internal and external networks and stakeholders. The five innovative and collaborative archetypes described by Gouillart show different perspectives on co-creation, even though they have common traits and they offer different resources for the purpose of gaining competitive advantage. The five approaches are very functional and they are all a good way to start in order to go in the right direction with good potential to create value for internal and external networks. Gouillart states that 'what leaders can do now is encourage more experimentation on the path to developing a co-creation ecosystem.' (Gouillart, 2013)

The direction that should be taken by leaders is the one of a co-creative ecosystem. The point is that innovation is absolutely necessary in order for companies to keep the position they have in the market. The challenge is about starting to establish relationships with external stakeholders to increase the potential value by externalising functions and

processes so that the new system will be not in form of singular exclusive companies. However, there is not exact rule that automatically tells executives which strategy is best or which outcome will be achieved in the end. In fact, none of them is a flawless strategy for wide and complicated problems and challenges.

Gouillart suggests what kind of change is necessary in order to make co-creation work on a global scale, and he describes what the problems are at the moment and what needs to be changed. The first point he describes is about finding a connection between business and social issues in order to deal with wider challenges through an articulation of the problem that can be faced with emotional and analytical resources. Furthermore, the new ecosystem must be able to invest in the development of the community in order to gather people with very different knowledge and backgrounds that do not exclude anyone willing to take part in the network. Another point is that networks should be able to offer user-friendly ideas and means to make users take actively part in the co-creation and co-design of products and services 'with professional designers who value their input.' (Gouillart, 2013)

Furthermore, in order to expand and spread co-creative networks it is important to provide the community with data so that people have the possibility to customise the data for their needs and they can make 'a unique experience for themselves.' (Gouillart, 2013) At the same time, companies should keep track of how users make use of the data in order to improve their understanding of the network and ecosystem surrounding the users. This understanding is also implemented among users themselves within their ecosystems. Furthermore, the final aim is to base the designing processes more and more on the users throughout, for example, platforms that allow co-creation and mutual interactions, by increasing the range of interactions among users.

Over time, the network of relationships between internal and external stakeholders is expected to grow and to open up to more and more opportunities. Furthermore, together with the growth of the network, over time also the knowledge of the members of the community is expected to grow and this enrich the power of the network and the community even more. In fact, Gouillart concludes his dissertation on networks and innovation by stating that the worth created by this ecosystem of organisations and stakeholders 'increase exponentially as more and more stakeholders join the network.' (Gouillart, 2013) The consequence of this exponential growth is that companies within

the network will gain exponential returns on investments in the network and community that they have carried out until then. This is, indeed, the challenge that executives must face in the future in order to be competitive and exploit this widespread potential of the market. (Gouillart, 2013)

Conclusion

Throughout the thesis, I have described many different aspects and facets of design thinking that describe the role that it has in nowadays economic and social environment. The purpose of the thesis was to provide, the reader, with the first chapter, with background knowledge about the concept of design thinking, possible frameworks of investigation, the role of design-driven innovation to design new solutions, the origins of design thinking, and the process to carry out solutions to new unrevealed needs. This first chapter, aimed at giving a global perspective on the framework of design thinking, design has been described as a human-centred process, which is key to understand the whole revolutionary features of this framework focused on problem-identification and solving not through quantitative methodologies, but, rather, through qualitative research, such as ethnography and direct research in the field just to give some examples.

Furthermore, the thesis is conceived to give points for reflection on the role of innovation and what really innovation means. To this point, Verganti has wrote a big deal of papers that explain the powerful of radical innovation of meaning that is strictly necessary in a world overcrowded by ideas. Why an idea is revolutionary and another one does not get noticed? According to Verganti, it is all about changing the meaning of the state of the current concepts and beliefs to create a new meaning out of it. This is the core of the concept of design-driven innovation, which is radical innovation focused on users' needs from a human-centric perspective.

Design-driven innovation is peculiar because it changes the usual relationship between meanings and technologies. People were used to think that innovation can be either incremental or radical depending on the incremental or radical change driven by the change and improvements in technology. Market-pull innovation which is just incremental change in meaning and technology is one type of incremental innovation, which is not what designers are hoping to achieve with design thinking. Along with technology push innovation which is radical change in technology accompanied by incremental meaning change. What designers aim to achieve is design-driven innovation, which is characterised by radical change in meaning. When meaning changes it is not

important that the state of technology has improved because it is not significant as long as meaning has changed and the outcome of the design thinking process is a new meaningful solution designed to satisfy users' needs.

Furthermore, in chapter one, I have described the framework of hermeneutics that is believed to be a very useful tool to define possible future scenarios. According to the framework of hermeneutics, innovation comes from a process of interpretation and envisioning, investigating the role of external networks in the process of meaning creation and development. Meaning innovation aims to change the way products are valued and especially in the reason why they are used, instead of focusing in the features of the products or how the product has to be used. The meaning projected in new products can still meet functional and needs for certain features but it will have also components related to symbolic and emotional needs. This approach gives designers a new approach to consider the concept of meaning creation through internal and external networks. The outcome of using a hermeneutic perspective is the redesign of the user experience through the interpretation of envisioning of existing and new potential scenarios.

Design thinking started to spread in the early 1960s. The framework of design started to be mentioned as a "way of thinking", and in the next decades it has developed until when it first started to be defined as "design thinking", in 1987 by Peter Rowe, professor of architecture at the University of Harvard. He wrote that designers should act through 'the lens of inquiry' (Rikke Dam and Teo Siang, 2019), which is indeed a stage of the process of design thinking. This stage is the one of field research, exploration, ethnography together with people who will be users of the future product or service. Peter Rowe wrote that design has the function to comprehend the surrounding environment through deep field research and inquiry, in order to identify the essence of things because this is the way to design artefacts that are, at the same time, new, meaningful, and consistent with the needs of users. Therefore, the definition of Peter Rowe was just the beginning of the development of design thinking as we know it today. What is interesting about the first definition of design thinking is that it was already back then conceived as an explorative and ethnographic process aimed to deeply understand the needs of people. Therefore, the concept has remained the same as we know it nowadays.

Furthermore, at the end of the first chapter I have described the nature of the process and the different phases of it. Design thinking is a highly iterative process that move back and

forth between abstract and concrete realms. Everything starts from a deep dive into the surrounding environment to then move to a process of synthesis where frameworks start to be conceived and insights regarding the problem-identification start to be identified. After the process of synthesis, the one of creation is consists in the definition of imperatives and in the generation of ideas. Consequently, the next step is the process of evaluation, solutions, and experiences, which aims to bring the process to an end with tested solutions and feedbacks obtained by real potential users. However, iteration is a very important characteristic of design thinking because it shows how the process is not linear but it is about going back and forth in order to define and redefine insights, imperative, ideas, needs, solutions, prototypes, etc.

In chapter two, I have deepened the level of analysis of design thinking to another level that is very important in order to understand why design thinking is such a powerful tool for the development of innovation and growth. I started by defining the hierarchy of innovation described by Hamel in his book *The Future of Management*. Different levels of innovation lead to different levels of value creation and potential sustainable competitive advantage. The more powerful the innovation carried out is, the more the competitive advantage is sustainable over time. Hamel describes operational innovation, which is the least powerful, and the next are product or service innovation, strategy innovation, and management innovation, which is indeed the most powerful. The concept of management innovation, which is defined as follows ‘the systematic promotion of innovations in organizations and includes tasks of planning, organization, management and control’ (Hengsberger, 2018) Management innovation is the deepest kind of innovation because it involves deep aspects of the company. For example, it takes place by getting in new markets with new products or services, improving them to stick out from the rivals, enhancing internal processes in order to optimize the internal activity, reducing costs and being more competitive in the market, or, finally, innovating the business model in order to gain more competitive advantage by changing strategy. (Hengsberger, 2018) Hamel places strategy and management innovation at the top because they have the power to change the position of the company in the market in a long-term perspective.

Martin, author of *The Design of Business*, conceived a model that shows how to advance during the three different phases of innovation, which he defines as mystery, heuristic, and algorithm. This model called the knowledge funnel allows managers to understand

that knowledge has to go through the above-mentioned steps during a period of time which should hypothetically be as short as possible. Time is an important factor when it comes to innovation, leadership, and competitive advantage. The least time is needed to carry out innovative solutions, the more time the company will be able to keep competitive advantage distancing itself from competitors. Furthermore, during this time of leadership, the company has the possibility to invest even more on research and innovation in order to try to gain even more competitive advantage, consolidating its status of leader in the market. The more the company innovates, the more it gains profit, and the more it can invest in further innovative solutions, and this cycle should keep going over and over again in order for the company to be successful. (Leavy, 2010)

In chapter two, I described the concepts of reliability and validity that, according to Roger Martin, are key in order for companies to be successful, they must find a balance between these two factors. Martin believes that they are the factors that allow companies to reach disruptive and sustainable innovation, if they take place at the same time and with the right balance. Martin states that companies tend often to focus on one of the two aspects, and the result, in the end, is not as good as it should or could be. Martin writes that reliability and validity are valued in a different way by different innovators. For example, he states that reliability is especially valued by managers and executives, while validity is valued more by designers, and this is another factor that shows the importance of design within corporations and how it should be implemented together with all the management activities. In fact, validity is a tool that allows designers to use their imagination to create new, superior, and improved solutions, while managers prefer to develop robust, systemic, and standard solutions that can be repeated. Therefore, what Martin states is that the solutions should be at the same time new, superior, improved, robust, systemic, and repeatable. This is why companies should put their efforts on developing reliability and validity at the same time and to the same extent in order to create something radically new. (Leavy, 2010)

Many factors make design thinking a very valuable process. For example, empathy with the potential users, co-creation, field research, ethnography, and so on. Since users are not aware of their needs, designers need to identify them to create radically new solutions, and, if they will be successful on this, the outcome of innovation will be competitive advantage. The problem within companies that struggle to stay in the market

or that have very little revenues is that they tend to cling to the usual methodologies and tools used to conduct the activities of a business. They are 'laced with generous servings of spreadsheets and power point decks detailing competitor data and past industry trends.' (Dhaundiyal, 2017) Even though, it has been shown that it does not make sense to look at the past in order to act in the present, because the past does not give sharp insights about the future and the risk is that companies focus too much on their experience instead of being open to new potential opportunities. (Dhaundiyal, 2017)

Gouillart states that what executives should do in nowadays market is to take one more step ahead to keep nurturing competitive advantage by applying a model of co-creation, which, among others, can be design thinking. And, rather than developing capabilities within the organisations to keep them exclusive, it is important to be open towards the external environment. Companies must face the market by unfolding their internal processes, such as research and development, marketing, in order to 'attract a dynamic ecosystem of customers and other stakeholders.' (Gouillart, 2013) According to Gouillart, it is important for companies to network in order to stand out of the competition and be successfully innovative. The key of development and success lays in relationships of the organisation with the outside environment.

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